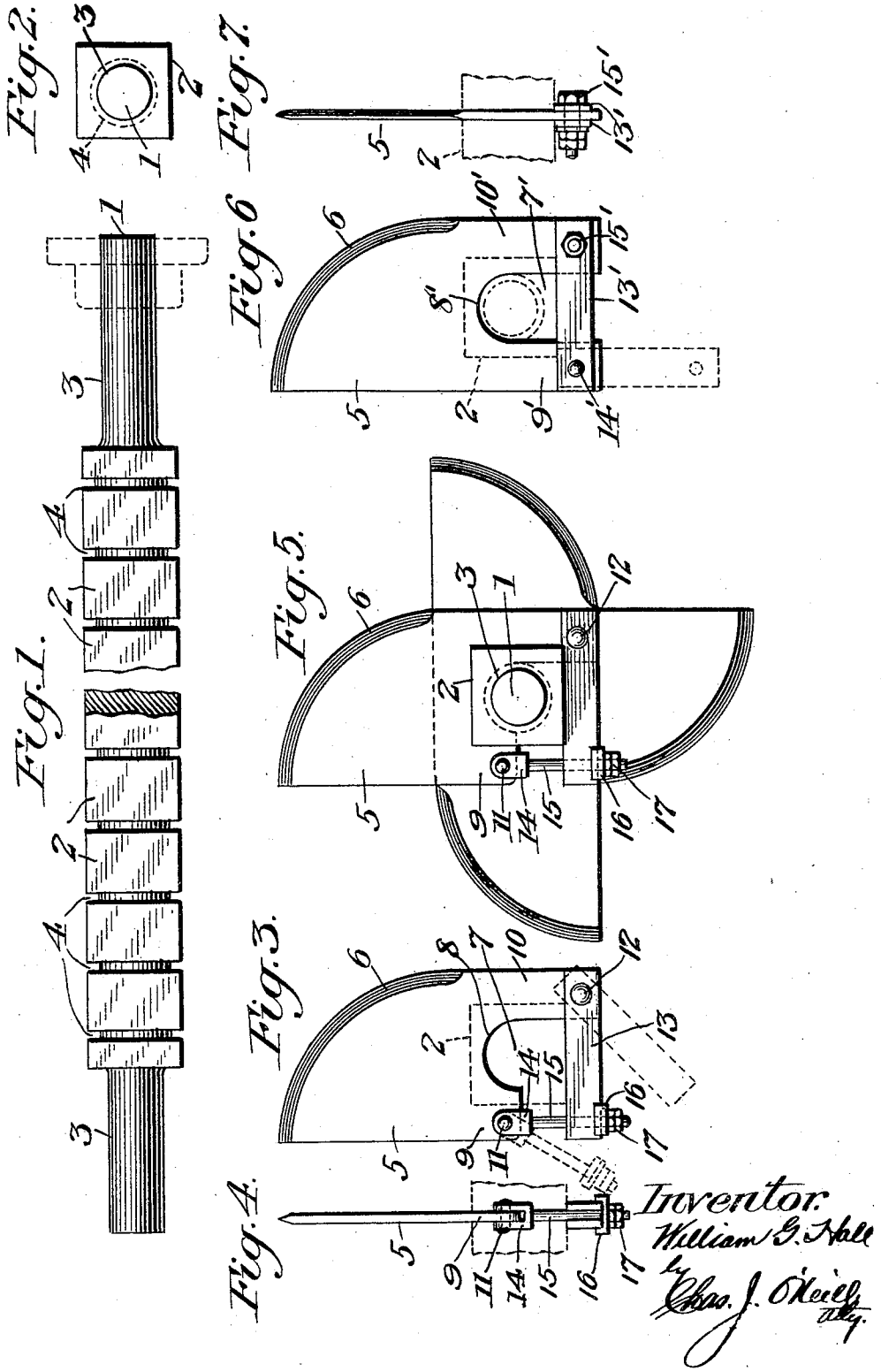
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REVOLVING CANE KNIVES.

APPLICATION FILED JAN. 4, 1921.

1,401,978. Patented Jan. 3, 1922.



UNITED STATES PATENT OFFICE.

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REVOLVING CANE KNIVES.

1,401,978. Specification of Letters Patent. Patented Jan. 3, 1922.

Application filed January 4, 1921. Serial No. 434,994.

To all whom it may concern:

Be it known that I, WILLIAM G. HALL, a citizen of the United States, residing at Honolulu, Territory of Hawaii, have invented certain new and useful Improvements in Revolving Cane Knives; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in revolving cutters for sugar cane mills, and particularly to the type wherein a plurality of blades or knives are detachably secured to a shaft or rotor of special design and construction.

The particular object of the invention is to provide a cutter of the class described, consisting of a single shaft or rotor upon which may be individually mounted and secured thereto a series of similarly constructed blades.

Another object is to so construct said cutting blades, and secure the same to the shaft, that any one may be expeditiously removed or replaced without disturbing the remaining blades and without the necessity of suspending operation of the mill for any length of time.

A still further object of the invention is the provision of a novel means of securing the cutter blades to the shaft, said means cooperating in a specific manner with the particular form of rotor or shaft employed.

Briefly stated, the invention comprises a rotor consisting of a squared shaft portion, properly reduced at the ends to provide for the necessary bearings, couplings or pulleys, according to the type of drive, the squared shaft portion being provided with a series of spaced circumferential grooves turned, at the proper distance apart, to accommodate the number of knives needed. Attached to the rotor at these reduced portions of the squared shaft are a series of cutting blades, each blade having its inner portion cut away in a specific manner and adapted to be inserted in said grooves to embrace the reduced portions of the rotor at these points. After the blade has been inserted in place, a pair of metallic straps are removably secured to the inner end of the knife blades in such a position that the inner straight edges of the straps will closely embrace one of the flat sides of the squared shaft, thereby securing the blade in place and at the same time preventing the turning thereof during the cutting process.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a view, partly broken away, showing the particular form of shaft or rotor employed in the improved form of revolving cutter forming the subject matter of this invention.

Fig. 2 is an end view thereof.

Fig. 3 is a side elevation of one of the cutter blades, illustrating the preferred form of securing means.

Fig. 4 is an edge view thereof.

Fig. 5 is an end view of the cutter as a whole, showing the means of positioning the various blades on the shaft with the preferred form of securing device.

Fig. 6 is a side elevation illustrating another exemplification of the invention with a modified form of securing device, and

Fig. 7 is an edge view of Fig. 6.

Referring to the drawings in detail, a rotor 1 is constructed with an intermediate squared shaft portion 2, and reduced end portions 3, which latter portions form the journals for receiving the necessary bearings, couplings or pulleys, according to the type of drive employed. It of course is to be understood that the same may be driven by belt, or directly connected to a motor, in any convenient manner.

The intermediate squared portion of the rotor 1 is provided with a series of circumferential grooves 4, turned on shaft 2, spaced apart the proper distance to accommodate a series of cutter blades 5, to be inserted thereon and secured in a manner to be hereinafter more fully described.

In the preferred form, each of the blades 5 is provided with a curved double knife edge 6 and a bifurcated or cut-out portion 7, the inner part of said cut-out portion 7 being curved as at 8, which curve is of the same radius as the reduced portion 4 of the shaft 2.

Formed by the cut-out portions 7 are a pair of legs 9 and 10, the leg 10 being of much greater length than the leg 9, and said legs at their lower ends are provided with openings for the reception of rivets or the like 11 and 12. Secured to the leg 10 by the rivet 12 are a pair of straps 13,

the rivet 12 being loosely set up to allow a pivotal connection between the straps 13 and said leg 10. Secured to the leg 9 by the rivet 11 is a yoke or clevis 14 carrying a nut-equipped bolt or rod 15, said rod forming an extension of the leg 9 slightly longer than the leg 10. The lower end of the bolt 15 is provided with an angular shaped jaw 16 supported upon a pair of lock nuts 17.

By reason of the construction hereinbefore described, it will be noted, upon referring to Fig. 5, that when the blade 5 is inserted in position on the shaft 2, the leg 10 carrying the straps 13 and the bolt 15 supporting the jaw 16, will extend beyond the squared portion of said shaft 2. After being placed in this position, the straps 13 are elevated to embrace one of the flat sides of the shaft 2 whereupon the bolt 15 is swung over and inserted between the open end of said straps. The lock nut 17, being properly adjusted, will allow the jaw 16 to be positioned directly under the ends of the strap 13 in a manner as clearly shown in Fig. 3. The straps 13 are made of sufficient width so that upon tightening lock nut 17 the inner edges of said straps will closely embrace the adjoining flat side of the shaft 2.

To remove the blade from the shaft, it is only necessary to loosen the nuts 17 whereupon bolt 15 may be withdrawn from between the straps 13, allowing said straps to drop down as indicated in dotted lines in Fig. 3. With this construction it will be noted that the various adjustments are accomplished in a very simple and efficient manner, and all danger of accidentally displacing any of the parts is substantially eliminated, the only adjustment being the nut 17. It will also be obvious that any working loose of the blades caused by wear, or the continuous operation of the knife, may be compensated for, by simply adjusting or tightening the nut 17 in the manner heretofore referred to.

In the modification illustrated in Figs. 6 and 7, the legs 9′ and 10′ of the bifurcated portion 7′ of the blades are provided with fastenings 14′ and 15′, respectively, and after the blades 5 have been inserted in their proper position in the grooves 4 of the rotor 1, it will be noted that both of the legs 9′ and 10′ with their fastenings 14′ and 15′ will project beyond the squared shaft 2. After being inserted in this position, a pair of straps 13′ are secured to either one of the legs 9′ and 10′ by a rivet or the like 14′. In the drawings the straps 13′ are illustrated as being riveted to leg 9′, but obviously the same could be similarly secured to either leg 9′ or 10′, as desired. The opposite ends of the straps 13′ are detachably secured to the other leg by a nut-equipped bolt 15′ which will permit these ends of the straps to be disconnected from the cutter blade 5 when it is desired to remove the same from the shaft 2. The straps 13′ are made of sufficient width so that when the same are secured in place the inner edges thereof will closely embrace one of the flat sides of the squared shaft 2. With this construction, the straps 13′ will not only secure the blades 5 in place but will effectively prevent the turning thereof during the operation of the cutter.

With both of the above described means of securing the blades to the shaft, any one of said blades can be very quickly removed and replaced without disturbing any of the other remaining blades and without shutting down the mill for any appreciable length of time.

Furthermore, in view of the fact that it is only necessary to remove a single fastening in replacing a blade, the liability of losing or dropping of any parts into the mill when a blade is replaced, is reduced to a minimum.

What I claim is:

1. A revolving cutter, comprising a shaft, having spaced circumferentially reduced grooves formed therein, cutter blades or knives, having their inner ends cut-out or bifurcated providing legs, adapted to be inserted in said grooves and embrace the reduced portion thereof, and clamping straps, pivotally attached to one leg and detachably connected to the other leg, adapted to embrace said shaft and secure the blades thereon.

2. A revolving cutter, comprising a squared shaft, having spaced circumferentially reduced grooves formed therein, cutter blades or knives, each having its inner end cut-out or bifurcated, providing a long and short leg, adapted to be inserted in said grooves and embrace the reduced portion thereof, one of said legs extending beyond the shaft, and detachable straps connecting said legs and embracing the flat side of the squared shaft for securing the blade on said shaft.

3. A revolving cutter, comprising a squared shaft, having spaced circumferentially reduced grooves formed therein, cutter blades or knives, each having its inner end cut-out or bifurcated, providing a long and short leg, adapted to be inserted in said grooves and embrace the reduced portion thereof, one of said legs extending beyond the shaft, straps pivotally connected thereto, a bolt or rod pivotally connected to and depending from said short leg, and means carried by said bolt for supporting the free end of said straps and clamping the same to the shaft.

In testimony whereof I affix my signature.

WILLIAM G. HALL.