

(No Model.)

C. RAABE.
ROTARY CUTTER.

No. 501,213.

Patented July 11, 1893.

Fig. 1.

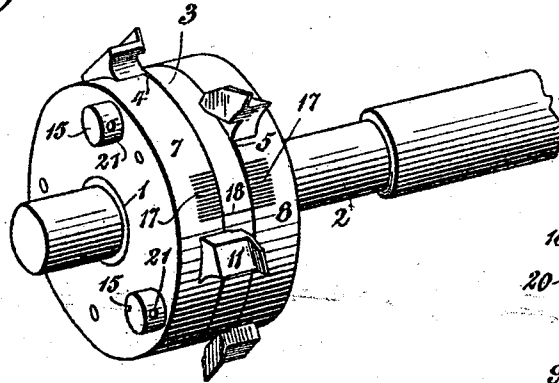


Fig. 6.

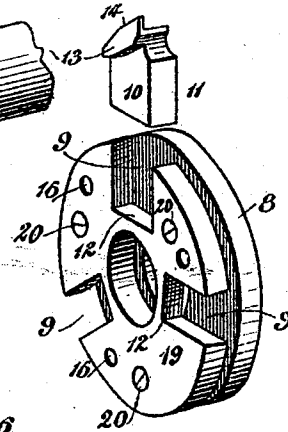


Fig. 2.

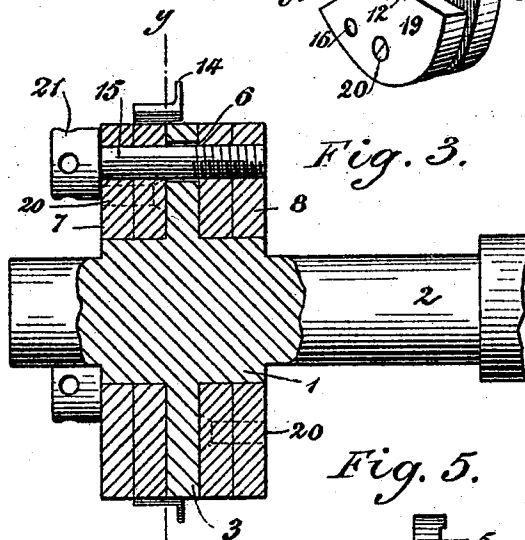
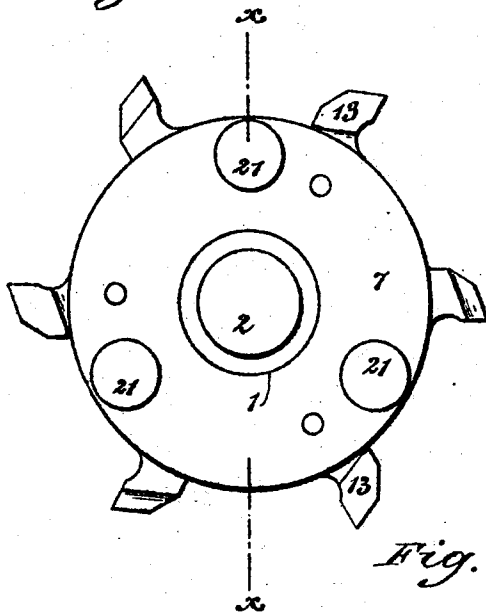


Fig. 3.

Fig. 5.

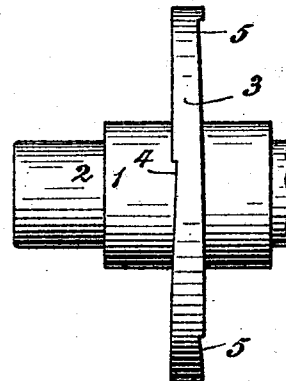
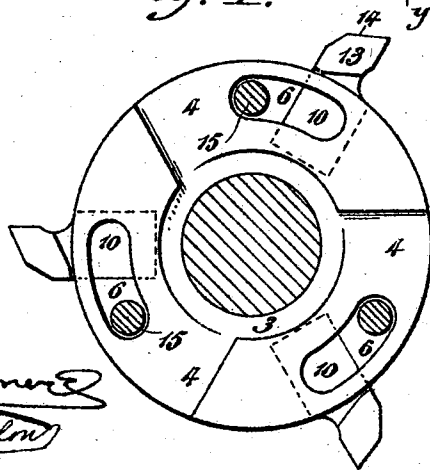


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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ROTARY CUTTER.

SPECIFICATION forming part of Letters Patent No. 501,213, dated July 11, 1893.

Application filed March 6, 1893. Serial No. 464,845. (No model.)

To all whom it may concern:

Be it known that I, CARL RAABE, a subject of the King of Prussia, German Emperor, residing at the city of Berlin, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Rotary Cutters, of which the following is a specification.

My invention relates to rotary cutter heads, for slotting plates, cutting gear teeth, &c., and consists of the improved construction hereinafter described and set forth, whereby a simple and efficient device is provided for the purpose stated, capable of ready adjustment to restore the cutters or bits to their relative operative position, and thereby compensate for variation of the same, caused by wear or grinding.

Heretofore, in so far as I am advised, cutter heads have consisted of sections receiving the shanks of the bits between them and adapted to be clamped together to so rigidly hold the bits that their outer faces, which serve as cutting portions, will be held in alternate operative relation. Such an arrangement will serve until the said outer cutting portions begin to wear, when, as will be readily apparent, they will vary in their cutting relation. Under the circumstances, the difficulty could only be overcome by either completely replacing the bits, or, if the head be of a special construction, by making adjustments more or less complicated. My improved cutter head admits of the bits being quickly and precisely adjusted to take up wear, without disturbing the relation of the parts composing the device.

In the accompanying drawings forming part of this specification,—Figure 1, is a perspective view of a cutter head constructed in accordance with my improvements. Fig. 2, is an end view of the same. Fig. 3, is a vertical, sectional view, taken in the plane indicated by the dotted line $x-x$, Fig. 2. Fig. 4, is a transverse sectional view taken in the plane indicated by the dotted line $y-y$, Fig. 3. Fig. 5, is a detail view of the stock and adjusting disk carried thereby, and Fig. 6, is a detail perspective view of one of the bits detached from its clamping plate, and showing a slight modification of the latter.

On a cylindrical enlargement 1, of the stock 2, is rigidly mounted a disk 3, on the opposite sides of which alternate cam depressions 4, 5, are formed, and all extend in the same direction as shown in Figs. 1, 4, and 5. Arc shaped slots 6, which pierce the disk 3, are equidistant and correspond in number with the cam depressions 4, at one side of the disk. Circular clamping plates 7, 8, have the same diameter as the disk 3, so as to register and be flush therewith when adjusted, the central opening in each plate being such that the latter can engage the enlarged portion 1, of the stock, to bear against the disk 3.

Each clamping plate on its inner side is provided with a series of radially extending recesses 9, Fig. 6, of rectangular shape, and terminating at the periphery of the plate. The number of recesses of each plate corresponds with the cam depressions on the adjacent side of the adjusting disk. Each recess 9, is adapted to receive the square shank 10, of a cutting bit 11, the bottom 12 of the recess forming the end seat for the shank. An inner offset 13, of each bit has a vertical edge ground away at the front to present substantially a rounded or inclined cutting portion 14. The plates 7, 8, are adjusted on opposite sides of the disk 3, and rigidly secured by bolts 15, which pass through openings therefor in plate 7, through the slots 6, in the adjusting disk and finally, by their threaded ends engage threaded openings 16 in the plate 8. By so securing the parts, the bits will be rigidly clamped in the recesses 9. The highest clamping effect can best be secured by having the shank of each bit slightly thicker than the recess, so that the projecting portion of the former will, when the parts are clamped, be in direct contact with the adjacent face of the adjusting disk.

In practice, the bit shanks will so bear in the cam depressions that the outer cutting faces of the cutting portions of two bits will conjointly make the desired cut or slot, it being understood that the forward edge of the first bit will primarily enter the work and make a cut by shearing at one side,—the following tooth making a shear cut at the opposite side, this operation being continued as long as may be necessary, by feeding the

work. As will be understood, the outer surface of the cutting portions will eventually become worn so that the cut will vary. When such occurs in the present construction, the difficulty can be quickly and easily remedied by loosening the bolts 15, and slightly turning the clamping plates 7, 8 relative to the disk 3, so that each of the shanks 10 will in consequence occupy a position in a shallower portion of the adjacent cam depressions. Such an adjustment will effect an outward movement of the bits sufficient to restore all the cutting portions thereof to the desired relative position. The degree of outward movement necessary will be governed by the degree of wear and the extent to which the cam plates are turned. The peripheries of both clamp plates 7, 8, are provided with a series of transverse marks or graduations 17, designed to operate with an index mark 18 on the disk 3, to indicate with precision the degree of movement made. The extent of movement required can be readily determined in advance by calculating the variations between the sides of the cutting portions and making the scale adjustment accordingly.

In view of the foregoing, it will hardly be necessary to add that with a cutter head of the improved construction, it is possible to adjust the transverse position of the bits to provide against exceedingly slight variations in the cutting portions of the same. The slots 6 are of such length that the plates 7, 8, can be turned relative to the disk to bring the shank of each bit to a position within the shallowest part of each cam depression, thereby permitting the use of the bits during a period of extended wear.

It will be found most desirable to make each clamp plate of two sections, the inner section 19 being notched so that when secured to the outer section by screws 20, the notches will present the required rectangular recesses 9. The convenience of such a construction of clamping plate will be obvious, as it will be easier to cut complete recesses from the peripheral portions than to form the recesses by cutting one side of the single plate. As shown, the bolts 15 are provided with transversely perforated heads 21, the object of the latter being to permit the insertion of a suitable key or rod to effect the required turning of the bolts when necessary. It will be obvious, however, that other securing means may be employed with equal satisfaction, and

I therefore do not wish to be understood as limiting myself in this particular.

I claim—

1. In a cutter-head, the combination with a stock, and a disk formed on opposite sides with cam depressions, and provided with elongated slots, of clamping plates formed with radial recesses to receive the bits, and clamping bolts extending through said plates, and through the slots of said disk, substantially as described.

2. In a cutter-head, the combination of a slotted disk having alternating cam depressions on opposite sides, plates and bolts for clamping the bits against said disk, the slots in the disk permitting, when the bolts are loosened, the turning of the plates to shift the bits in the cam depressions and effect the transverse adjustment of the bits, substantially as described.

3. In a cutter-head, the combination with a stock provided with an integral disk having alternating cam depressions plates and securing bolts for clamping the bits, said plates adapted when turned, to shift said bits to shallower portions of the depressions, and thus effect the relative adjustment of both series of bits, substantially as described.

4. In a cutter-head, the combination with the stock, and its integral disk formed with opposite cam depressions, and elongated slots, of clamping plates formed with radial seats for the bits, and clamping bolts securing the plates and disk together, and permitting when loosened, a slight rotary movement of said plates to adjust the bits transversely, substantially as described.

5. In a cutter-head, the combination with a stock, of a disk formed with a series of cam depressions, and a series of arc-shaped slots, a clamping plate formed with radial seats to receive the bits, a series of securing bolts adapted when loosened, to permit a limited rotary movement of said plate to adjust the bits, and a scale and index located on the peripheries of the disk and plate to indicate the extent of movement of the latter, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

CARL RAABE.

Witnesses:

MAX PIEPER,
MAX WAGNER.