

March 29, 1932.

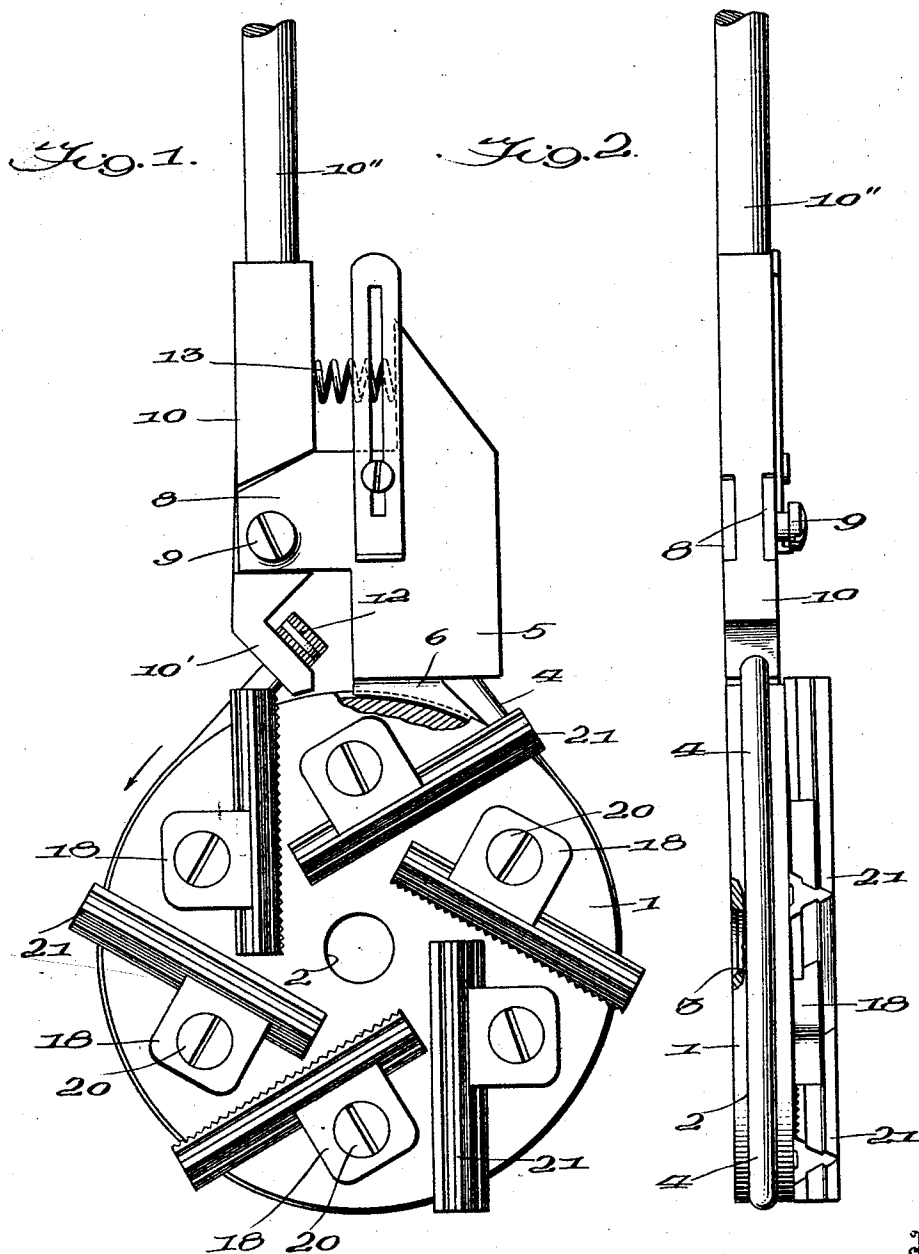
H. M. ALBEE

1,851,613

ROTARY CUTTER

Filed Nov. 14, 1930

2 Sheets-Sheet 1



Inventor

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2 Sheets-Sheet 2

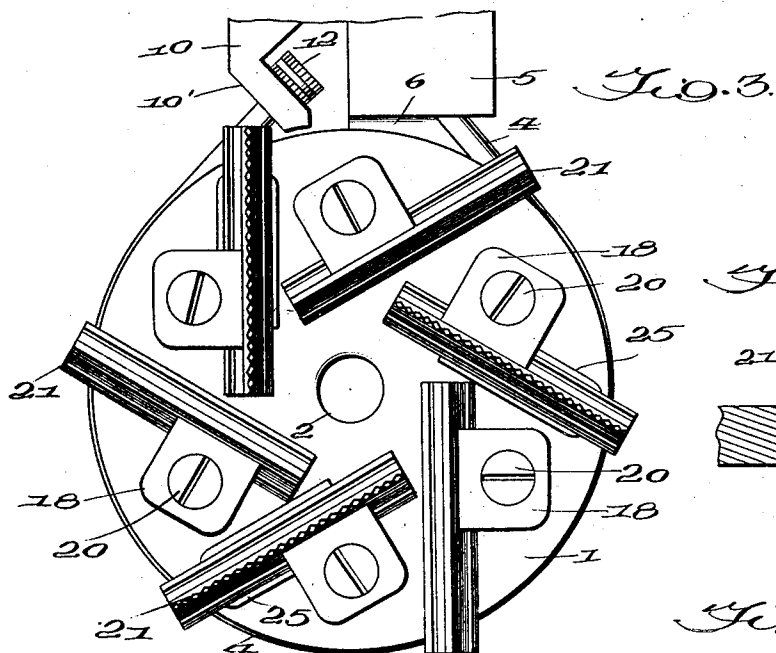


Fig. 3.

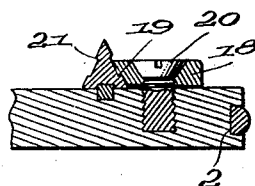


Fig. 6.

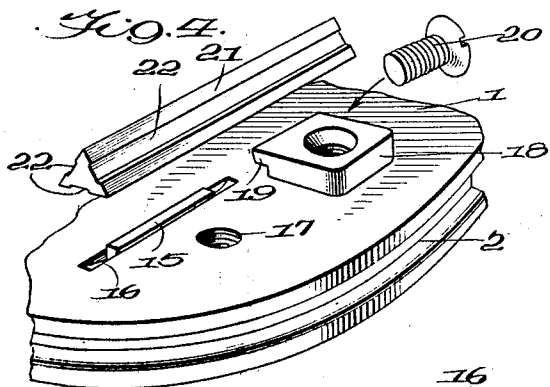


Fig. 4.

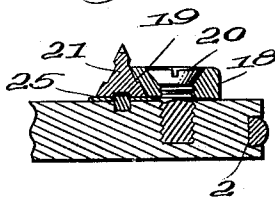


Fig. 7.

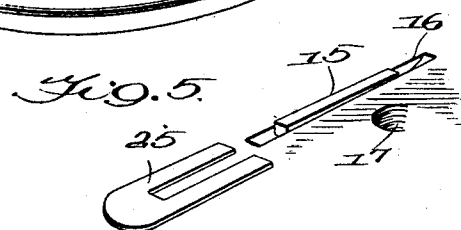


Fig. 5.

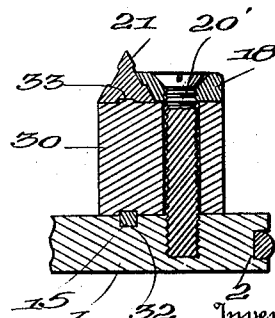


Fig. 8.

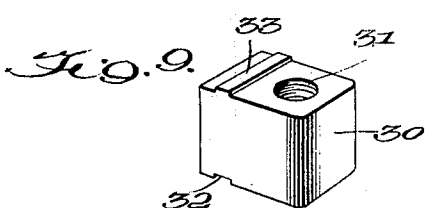


Fig. 9.

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## UNITED STATES PATENT OFFICE

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## ROTARY CUTTER

Application filed November 14, 1930. Serial No. 495,775.

The invention relates to rotary cutters of the general type shown in Patent No. 1,227,514, dated May 22, 1917, employed for dressing or recutting valve seats and the principal objects of the instant invention are to simplify the supporting and operating means for the cutter carrying disk, to provide a positive locking means for securing the cutters to the disks or to spacer blocks carried by the latter, and, generally stated, to provide a rotary cutter of simplified construction, but materially increased efficiency and durability.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a front elevation of the tool, the upper portion of the handle being broken away.

Fig. 2 is a side elevation.

Fig. 3 is a fragmentary view corresponding generally to that in Fig. 1, with the cutters arranged for preliminarily scraping the valve seat.

Fig. 4 is a fragmentary perspective showing one of the cutters and the accessories for locking the same to the disk.

Fig. 5 is a fragmentary perspective showing the mode of applying the shims, when the device is employed as a scraper.

Fig. 6 is a fragmentary sectional elevation showing the relation of one of the cutters and its securing means with respect to the disk.

Fig. 7 is a similar view showing the cutter arranged with its scraping edge in operative relation.

Fig. 8 is a fragmentary sectional elevation illustrating the mode of mounting the individual cutters on spacer blocks.

Fig. 9 is a perspective view of one of the spacer blocks.

Referring to the drawings, 1 indicates the rotary cutter head in the form of a relatively thin disk provided with a groove or channel 2 in its peripheral edge, which channel extends throughout the entire circumference of the disk and is generally rectangular in cross section. The center of the disk is provided with a socket 3 by means of which the tool may be supported in operative relation on a suitable cutter bar, as explained in the

patent aforesaid and in the other patents therein referred to. Substantially encircling the peripheral edge of the disk 1 and engaging the groove or channel 2 therein is a strap or yoke 4, preferably formed of spring steel and having its inner peripheral surface flattened to snugly engage the bottom of the groove or channel 2. One end of the strap 4 is fixed in the bottom of a block 5 and on the bottom of the block adjacent the anchorage of the strap therein is a toe or fulcrum member 6 having an arcuate face also engaging the bottom of the groove 2 in the disk. Extending laterally from the block 5 are two parallel shoulders 8 forming a clevis, in which is pivoted, on a pin 9, the lower portion of a lever 10 provided with an upward extension 10' in the form of an operating rod or handle. The portion of the lever below the pivot point is formed with an angularly disposed shoulder piece 10', which is perforated to receive the other end of the strap 4, which strap end is adjustably locked to the lever 10 by a knurled nut engaging the threads on the end of the strap. Disposed between the member 10' of the lever and the block 5 is a helical spring 13, which tends to move the portion of the lever above its pivot point outwardly and correspondingly move the lower portion 10' of the said lever inwardly, thereby causing the strap 4 to hug the bottom of the groove or channel 2 in the periphery of the disk with considerable pressure, so that, when the lever 10 is swung to the left, as viewed in Fig. 1, after the tool is adjusted for dressing or recutting a valve seat, the frictional engagement between the strap and the bottom of the peripheral groove 2 will give a partial rotation to the disk. Movement of the lever in the opposite direction, however, will cause the lower end of the lever to release the tension on the strap, so that the latter will slide around the peripheral groove and the disk will remain stationary. In the swinging movement of the lever, which is effected manually, the toe 6 on the block 5 serves as a fulcrum and also as a friction shoe assisting in imparting a rotary motion to the disk, when the lever is moved in

the direction to tighten the strap about the periphery of the disk, as explained.

The cutters 21 are of the same general type as those employed in the device shown in the patent aforesaid, that is to say, each cutter consists of a bar of steel in the form of a triangular prism having three coordinate cutting or dressing edges, or two straight cutting edges, the third being provided with teeth or serrations, which, when applied in operative position, will scrape the valve seat to remove any incrustations or foreign materials lodged thereon and which may also be employed to take a rough cut from the valve seat, if the latter is badly pitted or impaired. The cutter bars are provided on each face with a longitudinal groove 22, the groove in one face engaging a spline 15 fixed in the groove 16 in the face of the disk 1 and another of the grooves 22 is adapted to be engaged by a shoulder 19 formed on the undercut side of a clamp or dog 18, which is adapted to be locked to the plate in the relation shown in the drawings by a screw bolt 20 passing through an opening in the clamp and engaging a threaded opening in the disk 17.

As indicated, each of the cutters is secured, in a similar manner, to one face of the disk and is capable of longitudinal adjustment to operate on valve seats of varying diameters and, in all positions of adjustment, each cutter bar will be firmly clamped in position by the engagement of the spline 15 with one of the grooves in the cutter and the engagement of the associated clamp 18 with another of the cutter grooves, namely, that in the lateral face of the cutter bar adjacent the clamp.

In Fig. 1, the cutters are indicated as applied for the purpose of dressing or recutting a valve seat with the straight edges of each cutter lying in a common plane, which is parallel to the surface of the disk 1. It will be understood, of course, that any of the edges of the respective cutters may be employed in operating on the valve seat and, when it is desired to scrape the seat or to take a preliminary rough cut therefrom, those cutters having one edge provided with serrations are applied and clamped to the face of the disk so that the serrated edges are directed outward or toward the work. Under these circumstances, it is desirable to elevate these serrated cutting edges above the plane of the straight or plain edges of the other cutters and this is effected by slipping relatively thin shims 25 between the face of the cutter adjacent the disk, which shims straddle the splines 15, but leave enough of the latter projecting above the top surface of the shims to engage the groove in the bottom of the corresponding cutters, as more particularly illustrated in Fig. 7. After these serrated cutters have done their

work, they are released from the clamps, the shims withdrawn and the cutters replaced with a straight or plain cutting edge in operative relation, so that all of the cutters will then be effective in dressing or imparting the final cut to the valve seat.

When the tool is employed to operate upon valve seats that are associated with a centrally disposed projection, it will be necessary to space the cutters from the disk at a sufficient distance to bridge the projection and still permit the rotary disk or cutter bar with which it is associated to be properly positioned within the valve casing. To effect this spacing of the cutters, spacer blocks 30 are provided, corresponding in number to the cutters, each block having a groove 32 in its bottom to engage a spline 15 on the disk, and a rib or spline 33 on its top, which is adapted to engage the longitudinal groove in any cutter bar 21 which is mounted on said spacer block, in the manner shown in Fig. 8. In order to lock the cutter to the top of the coordinate spacer block 30, the same clamp 18 as employed to secure the same to the face of the disk is used, but instead of the relatively short screw stud 20, a screw of sufficient length to pass through the opening in the clamp and a registering opening 31 in the spacer block and to engage the threaded opening 17 in the disk 1, is applied in the manner and form shown in Fig. 8. It will be noted that, when the serrated edges of the cutters are to be employed and the cutters are mounted on the spacer blocks 30, the shims 25 may be applied between the bottoms of the serrated cutters and the upper faces of the spacer blocks, each shim straddling the rib 33 on the corresponding spacer block, so that these serrated edges of the cutters will be raised slightly above the plane of the straight or plain edges of the other cutters.

What I claim is:

1. A rotary cutter, comprising a disk, a plurality of cutters carried by one face thereof each comprising a bar of triangular prismatic form provided with longitudinal grooves in its faces, and means for locking the individual cutters to the disk each including a spline carried by the disk to be engaged by one of the cutter grooves, a clamp having an undercut face to engage a lateral face of the cutter, and a bolt for securing the clamp to the disk.

2. A rotary cutter, comprising a disk, a plurality of cutters carried by one face thereof each comprising a triangular prismatic bar provided with longitudinal grooves in its faces, and means for locking the individual cutters to the disk each including a spline carried by the disk to be engaged with one of the cutter grooves, a clamp having an undercut and shouldered face to engage the lateral

face and groove of the cutter, and a bolt for securing the clamp to the disk.

3. A rotary cutter, comprising a disk, a plurality of cutters adapted to be adjustably mounted on one face of the disk each comprising a triangular prismatic bar provided with longitudinal grooves in its faces, spacer blocks having ribs on their tops to engage the grooves in the bottoms of cutters mounted thereon and having grooves in their bottoms, splines on the face of the disk engaging the grooves in the bottoms of the blocks, clamps having undercut faces for engaging the lateral faces of cutters on the spacer blocks, and screw bolts engaging registering holes in the clamps, the blocks and the disk to lock the cutters to the blocks and the blocks to the disk.

In testimony whereof I affix my signature.

HUGH M. ALBEE.