

Oct. 7, 1941.

G. MENAQUALE

2,258,097

BORING BAR

Original Filed Jan. 25, 1937 2 Sheets-Sheet 1

Fig. 1.

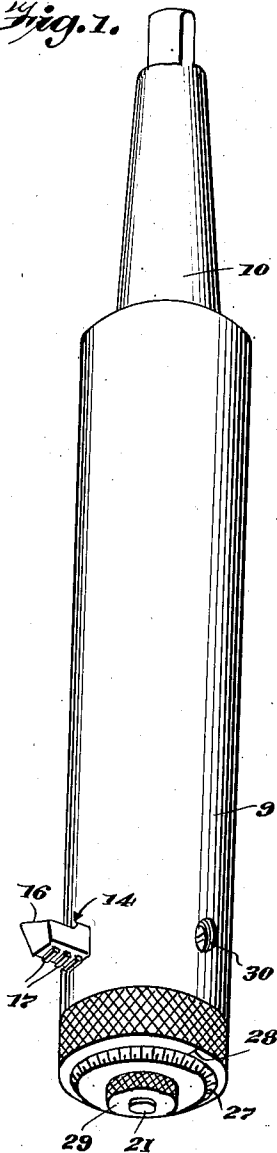


Fig. 4.

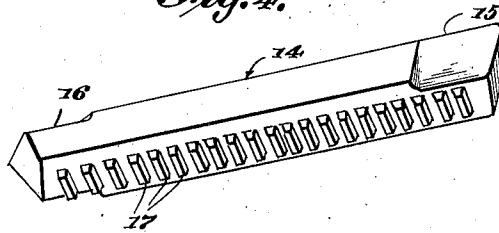


Fig. 5.

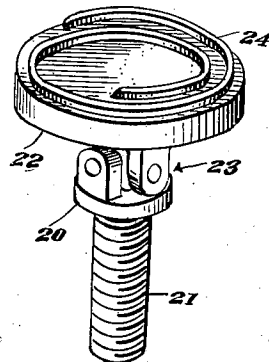
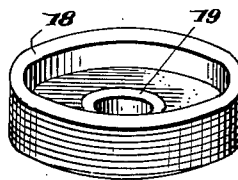


Fig. 6.



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Original Filed Jan. 25, 1937 2 Sheets-Sheet 2

Fig. 2.

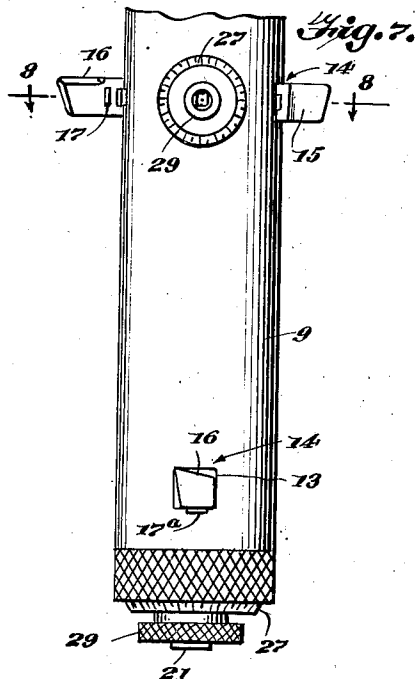
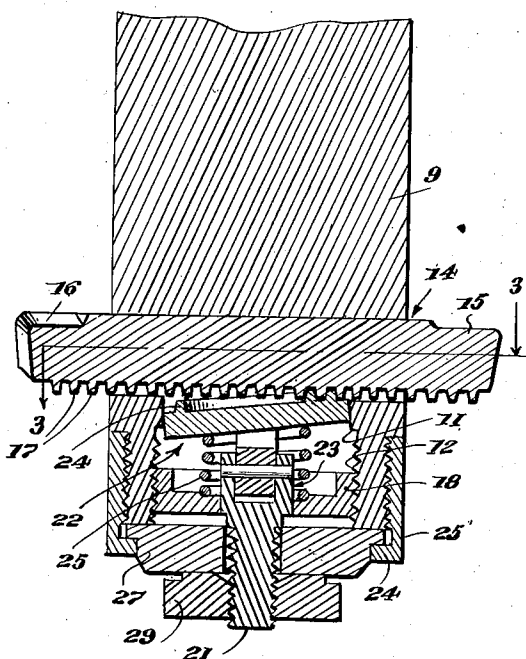


Fig. 3.

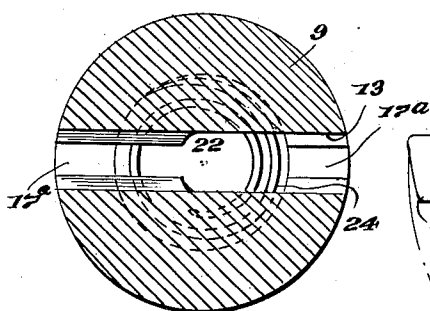
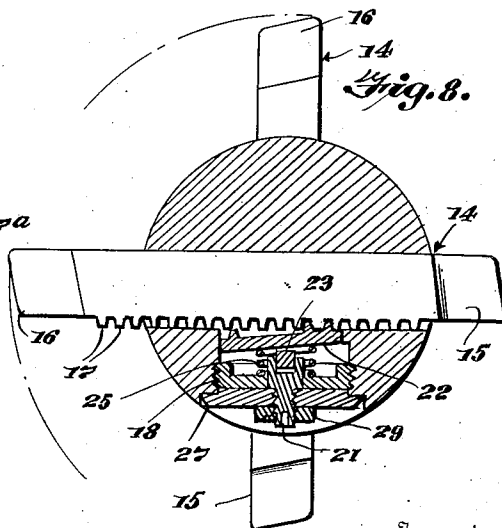


Fig. 8.



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UNITED STATES PATENT OFFICE

2,258,097

BORING BAR

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Substituted for abandoned application Serial No.
122,313, January 25, 1937. This application
June 13, 1940, Serial No. 340,357

6 Claims. (Cl. 77-58)

This invention relates to a structurally novel and improved boring bar characterized essentially and primarily by the incorporation therewith of a radially adjustable duplex cutter, and manually regulated micrometer actuating means therefor. This application is a substitute application for application No. 122,313, filed January 25, 1937.

It is a matter of common knowledge that a so-called hand adjusted cutting tool is not new in this particular line of endeavor. It follows, therefore, that my primary aim is to generally improve upon prior art and marketed arrangements by providing a special adaptation and mechanical coordination of features susceptible of enabling the desired result to be more satisfactorily obtained, whereby to provide an arrangement more aptly fitted for the special purposes intended.

In reducing to practice the mechanical principles of the invention conception, I have evolved and produced an ingenious selection and coordination of features characterized by readily available finger-controlled actuating means for adjusting the cutting means on opposite ends of the tool with respect to the boring bar with requisite accuracy and certainty.

A further feature of the invention is predicated upon the adoption and use of a pair of individually adjustable cutting tools on the same boring bar, wherein these are disposed at longitudinally spaced order and in cruciform or intersecting relationship to insure a substantially continuous boring action.

Other features and advantages will become more readily apparent from the following description and drawings.

In the accompanying drawings, wherein like numerals are employed to designate corresponding mechanical parts throughout the views:

Figure 1 is a perspective view of the complete boring bar showing the cutter tool and micrometer adjusting and actuating means therefor, this being the preferred embodiment of the invention.

Figure 2 is an enlarged fragmentary detail section of the essence of the invention, that is, the cutter and its adjusting means.

Figure 3 is a horizontal sectional view with the cutting tool removed.

Figure 4 is a perspective view of the specially constructed toothed cutter or tool.

Figure 5 is a perspective view of the spiral ribbed or threaded rotary feeder disk.

Figure 6 is a perspective view of the special adapter guide and spring-retention cup,

Figure 7 is a view in side elevation showing a modification of the invention utilizing inner and outer cutters disposed at substantially right angles to each other for a double action boring result, and

Figure 8 is a slightly enlarged horizontal sectional view taken approximately on the plane of the line 8-8 of Figure 7.

By way of introduction to the detailed description it is to be pointed out that the embodiment of the invention depicted in Figures 7 and 8 is a duplication of the cutter and adjusting means therefor illustrated in Figures 1 to 6, inclusive. It is thought that the description may therefore proceed more satisfactorily by describing first the invention seen in said Figures 1 to 6, inclusive. Thereafter the modification disclosed in Figures 7 and 8 will be exclusively described. As indicated in Figure 1 the boring bar comprises the customary longitudinally elongated cylindrical body portion 9 and the tapered shank portion 10, these being conventional features. As indicated in Figure 2 a socket 11 is bored in the lower end of the body 9, this being internally screw-threaded as indicated at 12. This socket is in communication with an intersecting passage or bore 13 for the cutter tool 14. It will be observed that the cutter tool is provided with cutting elements 15 and 16 at opposite ends. Moreover said tool is provided on one surface with a plurality of longitudinally spaced parallel segmental adjusting or regulating teeth 17. The teeth work through clearance notches 17a in the body 9 as shown for example in Figure 7.

Considering now in detail the manually regulated actuating means for the toothed cutting tool attention first comes to the part 18 depicted in Figure 6. This is a spring thrust as well as adapter cup. Its marginal screw-threaded portion is tapped into the threads 12 to position it in the socket 11 as shown to advantage in Figure 2. At its center it is provided with a bearing 19. This bearing is adapted to accommodate a disk head 20 on the adjusting screw 21. The adjusting screw is provided with lugs and these cooperate with companion lugs on the actuating disk 22 to form what may be generally referred to as a universal joint 23. This actuating disk is provided on its operative side with a spiral rib 24 which is in effect a thread. This thread is positioned to cooperate progressively with the segmental teeth 17 on the cutter as is obvious. The universal or swivel joint renders the threaded actuating disk 22 substantially self-leveling

permitting it to occupy the desired canted or tilted position within the area of the socket 11 as disclosed in Figure 2. It is to be observed that, that portion of the socket in which the disk rotates is obliquely formed for adequate adaptation purposes. The disk itself is pressed into constant yieldable contact with the teeth 17 through the instrumentality of a coil spring 25 which surrounds the universal joint and is interposed between said disk and the end thrust or retention cup 18.

The stem 21 extends out through the socket 11 and beyond said thrust cup 18 where it accommodates a dial disk 26. This disk telescopes into the socket as seen in Figure 2 and has a projecting peripheral abutment 27 properly beveled and graduated to co-act with the scale indicator 28 as seen in Figure 1. As clearly illustrated in Figure 2 of the drawings the outer free end of the bar has screw-threaded thereon a cap 25' provided with an inwardly directed flange 24. The upper surface of the periphery of the dial 27 is recessed for receiving the flange 24' of the cap securing the dial between the cap and the free end of the bar. The assembling and actuating nut is indicated at 29 and carried by the threaded stem and is bound tightly against the micrometer dial, whereby to rotate said knurled nut 29, dial and disk 22 in unison. That is to say, these parts rotate in relation to the adapter bearing or cup 18 making it possible to catch hold of the knurled nut 29 and to turn it to the desired degree to feed the cutter 14 either one way or the other in relation to the bar 9. When the desired adjustment is made the set screw 30 shown in Figure 1 is tightened to hold the cutter in set position.

As before indicated the arrangement depicted in Figures 7 and 8 includes the construction already described. That is to say, the cutter and adjusting means therefor is identical and, therefore, the same numerals are applicable to the same parts. The only thing to be brought out here is that the adjusting means is countersunk as seen in Figure 8, that is, countersunk into the socket 31 to avoid breakage during the rotation of the cutter carrying bar 9. Moreover the teeth on the cutter are on one side instead of on the bottom as seen in Figure 2. It is possible, however, that there may be novelty in this inner and outer cutter arrangement wherein the two cutters are individually adjustable and in positions at substantial right angles to each other.

The gist of the invention is reflected in the arrangement for trade in Figure 2. That is to say, novelty is predicated on the relatively slidable radially adjustable cutter tool 14 having segmental teeth 17 in proper progressive and constant feeding contact with the spiral threads on the rotary hand controlled disk 22. Under this arrangement it is possible to convert the rotary motion of the micrometer dial and associated nut 29 into the desired reciprocatory motion for the radially adjustable cutter tool 14. Thus, instead of resorting to guess-work and following haphazard methods of inadequately adjusting the cutter, it is possible with this arrangement to obtain precision adjustment to the point of requisite refinement.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the inven-

tion has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

Having described the invention what is claimed as new is:

1. In a structure of the class described, a boring bar provided with a radial tool accommodation passage, a cutter tool mounted for reciprocation in said passage, manually controlled resiliently mounted tool adjusting and locking means on said bar, and coacting operating connection between said means and said tool for actuating and adjusting said tool.

2. In a structure of the class described, a cylindrical boring bar provided in one end with a socket intersected by a radial passage, a slidable cutting tool mounted in said passage and provided with cutting elements on opposite ends projecting beyond the peripheral surface of said boring bar, that side of the cutter projecting into said socket being formed with longitudinally spaced segmental adjusting rack teeth, a dial regulated unit mounted for rotation in said socket, said unit including a rotary disk formed with spiral thread coacting with said rack teeth, and a coil spring for maintaining the thread in constant operative contact with the teeth.

3. In a structure of the class described, a boring bar having a socket, a passage intersecting said socket, a cutting tool mounted for sliding in said passage, said cutting tool being provided with longitudinally spaced segmental rack teeth, a cup mounted in said socket and including a central bearing, a threaded stem mounted for rotation in said bearing, dial-equipped turning means for said stem, a disk having universal connection with said stem, said disk being located in the socket and interposed between the cup and the rack teeth, and a coil spring surrounding the universal joint and bearing at one end against the disk and at the opposite end against said cup.

4. In a structure of the class described, a boring bar provided with a socket therein intersected by a radial passage, a slidable cutting tool mounted in said passage, that side of the cutting tool projecting into the socket being formed with rack teeth therein, and resiliently mounted adjusting and locking means in said socket adapted to normally cooperate with said rack teeth for the fine adjustment thereof and being retractible therefrom to permit of the insertion of, removal from and rough adjustment of said tool.

5. In a structure of the class described, a boring bar having a socket therein intersected by a radial passage, a cutting tool mounted for sliding in said passage, said cutting tool being provided with longitudinally spaced segmental rack teeth therein disposed at an angle to the longitudinal axis of the tool, a cup mounted in said socket and including a central bearing, a threaded stem mounted for rotation in said bearing, a dial equipped turning means for said stem, a disk having a universal connection with said stem, said disk being located in the socket and interposed between the cup and the rack teeth and being disposed at an acute angle to the longitudinal axis of the bar, and a coil spring surrounding the universal joint and bearing at one end against the disk and at the opposite end against said cup, said disk being provided with a spiral thread thereon, the coil spring normally maintaining a portion of the thread into coacting relationship with the teeth of said tool, said disk being retractible from the teeth of said tool for

the insertion of the tool in the socket, the removal therefrom and the rough adjustment of the tool.

6. In a structure of the class described, a boring bar having a socket, a passage intersecting said socket, the longitudinal axis of that portion of the socket adjacent the passage being disposed at an acute angle to the longitudinal axis of the passage, a cutting tool mounted for sliding in said passage, said cutting tool being provided with longitudinally spaced segmental rack teeth therein disposed at an acute angle to the longitudinal axis of the tool, a cup mounted in said socket and including a central bearing, a threaded stem mounted for rotation in said bearing, dial-

equipped turning means for said stem, a disk having a universal connection with said stem and mounted for rotation in that portion of the socket adjacent the passage, a spiral thread on said disk coacting with said rack teeth, and a coil spring surrounding the universal joint and bearing at one end against the disk and at the opposite end against said cup normally maintaining the thread in constant operative contact with the teeth and permitting of the retracting of the disk from the tool for the insertion of the tool in the passage and the removal therefrom and rough adjustment of the tool in the passage.

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