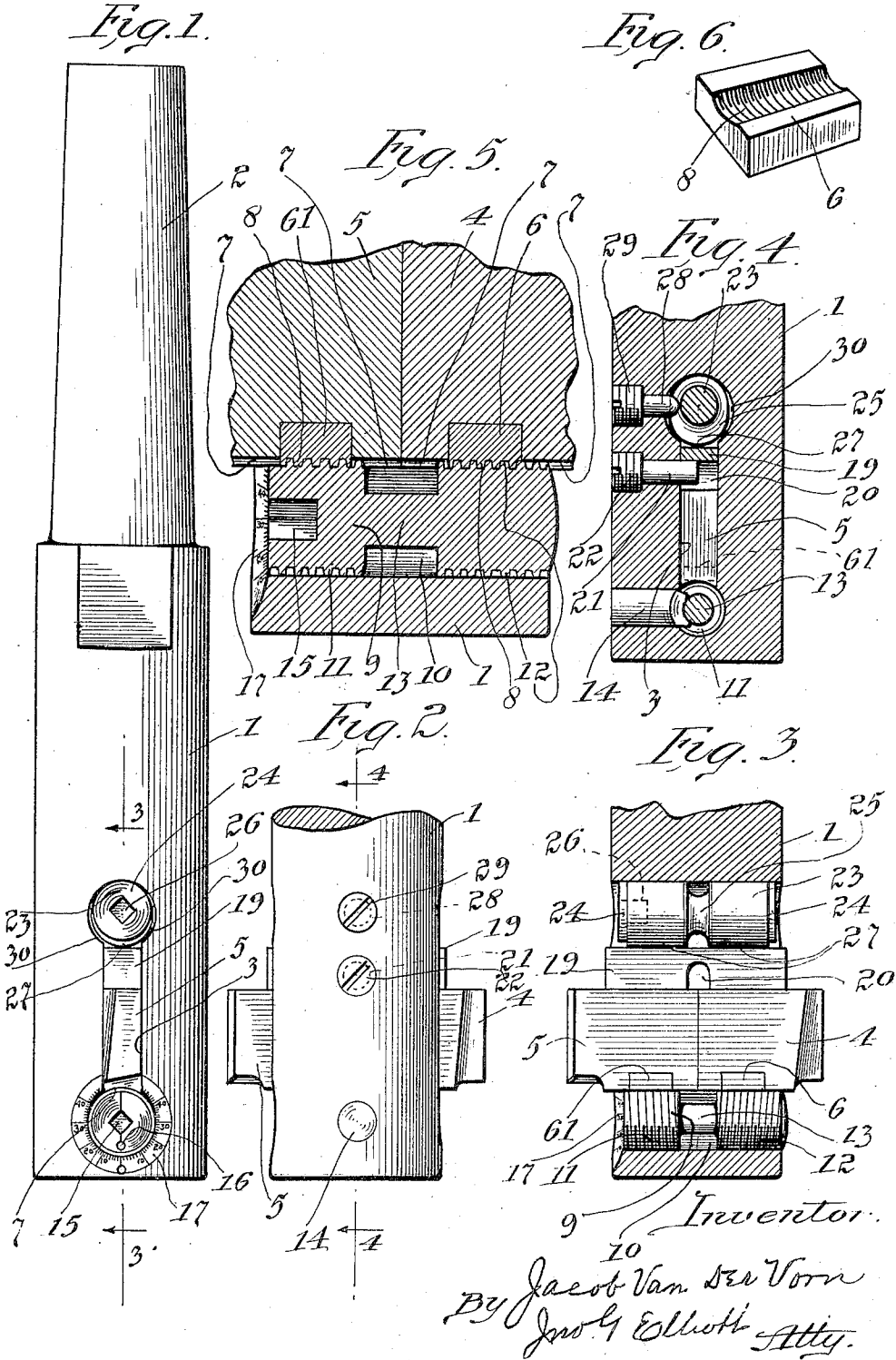


JACOB VAN DER VORN.
BORING BAR.
APPLICATION FILED JULY 3, 1919.

1,400,642.

Patented Dec. 20, 1921.



UNITED STATES PATENT OFFICE.

JACOB VAN DER VORN, OF CHICAGO, ILLINOIS.

BORING-BAR.

1,400,642.

Specification of Letters Patent. Patented Dec. 20, 1921.

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To all whom it may concern:

Be it known that I, JACOB VAN DER VORN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Boring-Bars, of which the following is a full, clear, and exact specification.

My invention relates to improvements in boring-bars for metal working, and more particularly to boring-bars of the expansion type wherein diametrically arranged cutters are adjustable to and from the axis of the bar for varying the diameter of the bore.

The prime object of the invention is to provide a boring-bar, having diametrically opposed cutters, with removable threaded means adapted to be inserted in the cutters for coöperation with an adjusting screw having reversely disposed threads, whereby removal of either the cutters or threaded means, in case of wear or breakage, is rendered much more economical than if these parts were integrally formed. Moreover, in such a construction, the proper variation in quality and hardness of steel for the cutters and threads which perform different functions is more readily attained.

A further object is to provide a graduated dial so arranged relative to an adjusting screw for varying the positions of cutters in a boring-bar that the operator may determine at a glance the exact variation being made by turning said screw.

And a further object is to provide a locking-key for cutters of such form and dimensions as to prevent distortion of the coöperating parts in the boring-bar when subjected to heavy pressure. Other objects will appear hereinafter.

With these objects in view my invention finds embodiment in certain features of construction, of novelty in the construction, combination and arrangement of parts, by which said objects and certain other objects are attained, all as hereinafter described with reference to the accompanying drawings and more particularly pointed out in the appended claims.

In said drawings:

Figure 1 is a side elevation of a boring-bar constructed in accordance with the present invention.

Fig. 2 is a partial side elevation of the bar taken at right angles to that of Fig. 1.

Fig. 3 is a central vertical section taken on line 3—3 of Fig. 1.

Fig. 4 is a section similar to Fig. 3 taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged fragmentary section taken on the same plane as Fig. 3.

And Fig. 6 is a detail perspective view showing a removable threaded block employed in the boring-bar.

The preferred form of construction as shown in the drawings comprises a cylindrical body formed integrally with a tapered shank 2. One end of body 1 is provided with a transverse slot 3 for the reception of diametrically opposed adjustable cutters 4 and 5, which project an equal distance from opposite sides of said body, as shown in Fig. 2.

Cutters 4 and 5 are provided with recesses in one edge thereof into which rectangular threaded blocks 6 and 61 are pressed respectively, the fit of said blocks in their respective recesses being such as to hold them securely, but not too tight to prevent their ready removal in case it is desired to renew either the cutters or blocks.

The edges 7 of cutters 4 and 5 into which blocks 6 and 61 are inserted, are concaved in such a manner as to be in alinement with the bottom of threads 8 in said blocks, as shown in Figs. 1 and 5, said threads 8 coöperating with an adjusting screw 9 mounted in a bore provided at the lower end of slot 3 in body 1. The threads 8 of blocks 6 are right and left hand to fit corresponding threads 11 and 12 on screw 9. From this construction it will be seen that the concaved surface 7 will contact with threads 11 and 12 to a certain extent and thus relieve blocks 6 and 61 of a part of the pressure when cutters 4 and 5 are clamped in position.

The adjusting screw 9 is provided with a medial reduced portion 13 which is surrounded by an annular space into which a radial pin 14 projects for maintaining said screw in proper position while being turned for adjusting cutters 4 and 5, said pin being securely pressed into body 1, as shown in Fig. 4. A square recess 15 is formed in one end of the adjusting screw 9 for the reception of a T-wrench (not shown) employed for turning the same.

One end of the adjusting screw 9 is provided with a diametric line and a zero mark

16 which registers in Fig. 1 with a corresponding zero mark on a dial 17 surrounding the screw, as shown in Figs. 1, 3 and 5. Dial 17 is so graduated as to enable the operator to determine within a thousandth of an inch just how much the adjusting screw is being turned for adjusting cutters 4 and 5, the diametric line and zero mark 16 serving as a dial pointer.

10 A clamping pad 19 of rectangular form projects slightly beyond the lateral surfaces of body 1 and is provided with a central recess 20 for the reception of a radial pin 21, whereby the pad is held in place during adjustment of the cutters. Pin 21 is retained by means of a short screw 22, as shown in Figs. 2 and 4.

An eccentric locking-key 23 arranged to cooperate with clamping pad 19 for holding the cutters is somewhat shorter than the diameter of body 1 and is provided with reduced ends 24, whereby the length of contact on clamping pad 19 is shortened to such an extent as to preclude the possibility of exerting any unresisted pressure on the cutters 4 and 5, which might result in distortion thereof. A circumferential groove 25 is provided at the center of locking-key 23, and a squared recess 26 at one end thereof, whereby said locking-key may be readily turned for bringing the eccentric surfaces 27 thereof into contact with clamping pad 19, as shown in Fig. 4. A pin 28 projects into groove 25 in such a manner as to permit the locking-key to turn freely and to prevent endwise movement thereof, there being a pin retaining screw 29, similar to screw 22, screwed into body 1.

It will be noted that a transverse cylindrical bore 30 is provided for locking-key 23, and that one side of this bore communicates with slot 3, as shown in Figs. 1 and 4.

From the foregoing description it will be seen that a substantial boring-bar is constructed without employing threads on the cutters, inserted threaded blocks being employed instead. This feature is advantageous for the reason that a threaded block can be removed from an old or worn out cutter and reinserted in a new cutter, thus saving the cost of furnishing new threads when only a new cutter is required.

While I have shown and described the preferred construction for carrying my invention into effect, there might be variations and modifications without departing from the spirit of the invention. I, therefore, do not

wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A boring-bar, comprising a substantially cylindrical body having a transverse slot therein, a pair of diametrically opposed cutters mounted in said slot, an adjusting screw having reversely disposed threads arranged contiguous to said cutters, and threaded blocks removably inserted in said cutters with only their surface adjacent the screw protruding, and said surfaces being threaded to cooperate with the screw.

2. In a boring-bar, the combination of a cylindrical body and a shank formed integrally therewith, of a pair of radially projecting cutters mounted in said body, and means for radial adjustment of said cutters comprising a right and left-hand screw mounted adjacent thereto, and removable solid screw-threaded blocks inserted in said cutters with only the surface adjacent the screw protruding, said surfaces being screw-threaded and cooperating with said screw.

3. In a boring-bar, the combination of a cylindrical body having a central longitudinally extending slot therein, of a pair of radially extending cutters mounted in said slot so that the inner ends thereof are adapted to meet on a line coincident with the axis of said body, a revolving screw arranged parallel to said cutters and disposed adjacent one edge thereof, means for preventing endwise movement of said screw, the latter having righthand threads on one end and lefthand threads on the other, a removable solid block inserted in one cutter having external righthand threads for cooperation with one end of said screw, and a removable solid block inserted in the other cutter having external lefthand threads for cooperation with the other end of said screw, with only the surfaces of said blocks adjacent the screw protruding.

In witness whereof, I have hereunto set my hand and affixed my seal, this 30th day of June, A. D. 1919.

JACOB VAN DER VORN. [L. S.]

Witnesses:

H. SLACK,

JNO. G. ELLIOTT.