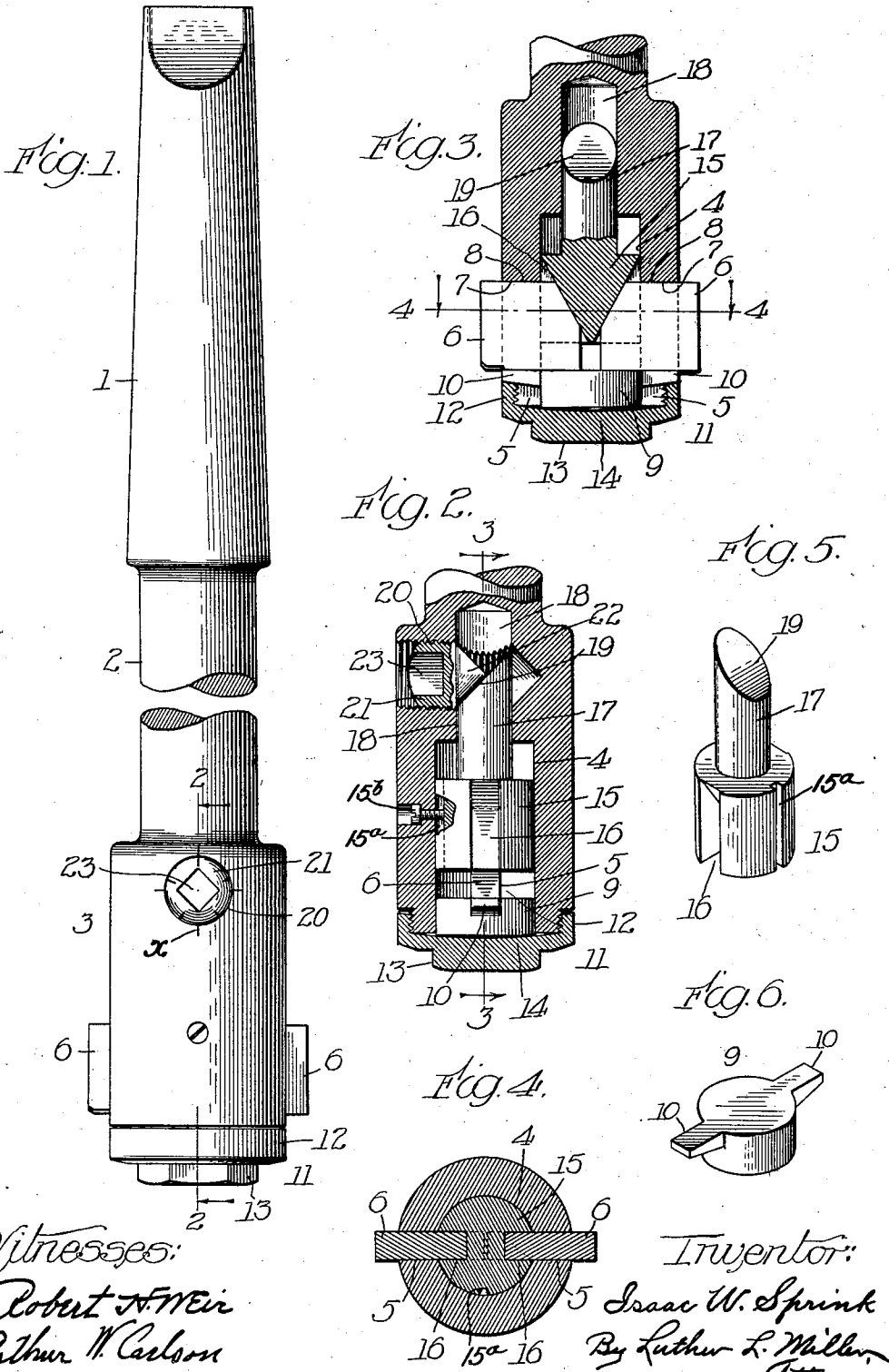


I. W. SPRINK.
BORING BAR.
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UNITED STATES PATENT OFFICE.

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BORING-BAR.

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To all whom it may concern:

Be it known that I, ISAAC W. SPRINK, a citizen of the United States, residing at Oak Park, 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 specification.

This invention relates to boring bars and similar tools, and its object is to provide improved means for adjusting the cutters and for securing them in adjusted position.

In the accompanying drawings, Figure 1 is an elevation, with parts broken away, of a boring bar embodying the features of my invention. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 3. Figs. 5 and 6 are perspective views of two elements entering into the construction of the device.

The embodiment herein shown in my invention comprises a securing shank 1, a stem 2 and a head 3, but it will, of course, be understood that the specific form of the device will vary with the type of machine in which it is to be used, as, for example, drills, lathes and the like.

The head 3 has an axial opening 4 therein extending from the outer end of the head to a suitable depth to form a socket. A suitable number of slots 5 are formed through the annular wall of the socket, as shown in Fig. 4, to receive the cutters 6. In this instance I have shown but two cutters, the slots 5 being at diametrically opposite points in the head 3, and the edges 7 of said cutters lying against the end walls 8 of said slots. The cutters are held between said end walls and a washer 9 (Fig. 6), said washer fitting in the lower portion of the opening 4 and having two diametrically opposite wings 10 thereon to enter the slots 5 and lie in contact with the adjacent edges of the cutters. The upper sides of the wings 10 are flush with the upper side of the washer 9, as shown in Fig. 3, therefore it will be seen that the cutters 6 are supported substantially throughout their entire length. The washer is held in place by means of a screw cap 11 comprising an annular internally-screw-threaded flange 12 which is adapted to engage the screw-threaded lower end of the head 3. Suitable means may be provided for rotating the cap 11, as, for example, a hexagonal projection

13 upon the end wall 14 of said cap. The washer 9 lies against said end wall. In order to permit the washer 9 to tilt slightly to adjust itself to any inequality in the size of the cutters 6, the inner face of the end wall 14 and the edge of the flange 12 are made slightly concave, and the lower sides of the washer 9 and the wings 10 are made slightly convex to conform to the concave portions of the cap.

The means for adjusting the position of the cutters 6 comprises a wedge formed in this instance of a cylindrical block 15 slidably mounted in the opening 4 and having diametrically opposite slots 16 therein, the bottoms of said slots being inclined, as shown in Fig. 3. The cutters 6 are adapted to extend into the slots 16 and have their inner corners chamfered on an angle corresponding to the angle of inclination of the bottoms of said slots. It will be seen from Fig. 3 that as the block 15 is moved downwardly, the cutters 6 will be forced outwardly.

To prevent the block 15 from accidentally rotating so as to carry the slots 16 out of register with the slots 5, a groove or keyway 15^a may be formed in said block to receive the inner end of a pin or screw 15^b seated in the head 3.

The means for moving the block 15 to force the cutters outwardly comprises a stem 17 integral with or otherwise suitably attached to said block, said stem being slidable within an axial opening 18 in the head 3. The end of said stem is chamfered, as at 19. Intersecting the opening 18 at right angles thereto is a screw-threaded opening 20 in which is mounted a screw 21 having a conical inner end 22 adapted to contact with the chamfered surface 19 of the stem 17. The screw 21 may be adapted for rotation in any suitable way, as, for example, by forming therein a square opening 23 to receive a key (not shown).

In use, cutters 6 are placed in the slots 5 and frictionally held therein by rotating the cap 11, the cutters being held between the end walls 8 and the winged washer 9. The screw 21 is then rotated to force the wedge block 15 downwardly so as to force the cutters apart to the desired extent. After this adjustment has been obtained, the cutters 6 may, if desired, be rigidly fixed in position by tightening up the screw cap 11. It will

be seen that as the cap 11 is rotated, the washer 9 is free to rock to adjust itself to any slight difference in the width of the cutters 6, so as to securely engage and support both of the cutters.

The cutters are moved by the action of the inclined planes formed by the bottoms of the slots 16, and said planes are moved by the action of the screw 21 upon the inclined plane 19. It will therefore be seen that a very fine adjustment of the cutters may be had. The screw 21 serves to lock the cutters against inward movement. The cutters are efficiently supported against lateral stresses by the walls of the slots 5 and 16.

To aid the operator in adjusting the cutters the head or outer end of the screw 21 may be graduated, as shown in Fig. 1, adjustments being made by turning said screw to bring the desired index line or graduation into register with one of the index lines α on the head 3. The number of lines on the screw may be one greater than the number of lines on the head, as shown, in order to constitute a vernier scale. Numerals indicating the amounts of adjustment to be obtained may be placed opposite the index lines.

It will be understood that the invention is applicable to bars having more than two cutters, the number of slots 5 and 16 varying with the number of cutters.

As modifications will readily occur to those familiar with the art, I do not wish to limit myself to the precise construction herein shown and described, but desire protection on all such forms as may be included by the terms of the following claims.

I claim as my invention:

1. In a tool of the character described, a socketed member having slots formed through its walls; cutters mounted in said slots; a washer mounted in the socket of said member and having wings extending into said slots, said wings being arranged to contact the adjacent portions of said cutters; means for forcing said wings against said cutters, said washer and wings being free to rock to accommodate themselves to inequalities in the size of the cutters; and means for moving said cutters.

2. In a tool of the character described, a socketed member having slots extending through its walls; cutters mounted in said slots; a washer mounted in the socket of said member and having wings extending into said slots; a cap having a screw-thread engagement with one end of said socketed member for forcing said washer and said wings into contact with said cutters, the surfaces of said wings and washer contacted by said cap being convex and the contacting portions of the cap being concave to permit said washer and wings to rock to accommodate themselves to inequalities in the size of

the cutters; and means for moving said cutters.

3. In a tool of the character described, a head having an axial opening extending from one end of said head and having radial slots formed through its walls; cutters mounted in said slots; a cylindrical block slidably mounted in said axial opening and having radial slots therein to receive the inner ends of said cutters, the bottoms of the slots in said block being inclined to form inclined planes and the inner ends of the cutters being chamfered; a washer mounted in said axial opening and having wings extending into the slots in said head to lie in contact with said cutters, the surfaces of said washer and wings adjacent said cutters being alined to provide a support for said cutters throughout substantially the entire length of the latter; a cap having a screw-thread engagement with the open end of said head, said cap comprising an annular flange adapted to bear against said wings and an end wall adapted to bear against said washer, said end wall and the edge of said flange being concave and the adjacent sides of said wings of said washer being convex to permit said washer and wings to rock to accommodate themselves to inequalities in the size of the cutters; a stem fixed to said block and slidably mounted in the axial opening in said head; and a screw mounted in a threaded opening intersecting the last mentioned axial opening in said head, said screw having a conical inner end and said stem having a chamfered inner end for engagement by the conical end of the screw.

4. In a tool of the character described, a head having an axial opening extending from one end thereof and having radial slots formed through its walls, cutters mounted in said slots, a block mounted in the opening in said head and having wedging surfaces at one end arranged to bear against said cutters, means for moving said block, a washer arranged to bear against said cutters at the side opposite said block, said washer having wings adapted to lie in said slots, said head having external screw threads at one end, and a cap having an annular internally-screw-threaded flange adapted to be turned on the threaded portion of said head and bear against said washer, the inner side of said cap and flange being concave and the adjacent portions of said washer and said wings being convex to permit said washer to adjust itself to inequalities in the sizes of said cutters.

5. In a tool of the character described, a head having an axial opening extending from one end thereof and having slots cutting through its walls, the inner end of said opening being reduced in size, cutters mounted in said slots, a cylindrical block

slidably mounted in said opening and having a stem slidable in the reduced inner end of said opening, said block having slots therein in which the inner ends of said cutters lie, the bottom walls of said slots providing inclined faces and the inner ends of said cutters being chamfered and engaging said faces, said head having a longitudinal groove therein, a set screw extending through the wall of said head and into said groove for preventing rotation of said block, means for longitudinally sliding said block to adjust said cutters, and a cap having a screw thread engagement with said head, said cap being adapted to clamp said cutters in their adjusted positions.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."