To all whom it may concern:

Be it known that I, GEORGE L. WOOD, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Supports for Expanding Reamers, of which the following is a specification, accompanied by drawings forming a part of the same.

The object of my present invention is to provide a support for an expanding reamer while the latter is undergoing the operation of being ground, and in the accompanying drawings I have shown an expanding reamer held in a support embodying my present invention, which enables the reamer to be ground independently of its center. In grinding reamers of the ordinary non-expanding type, it is possible to support the reamer upon its “centers,” but in the case of expanding reamers this method is not available, for the reason that the expanding plug is screw threaded into the reamer which destroys the accuracy of the center provided in the expanding plug.

By my improvement I support the reamer by the cylindrical portions at opposite ends of the reamer by means of V-shaped supports in alignment with each other. I also provide means whereby reamers of different sizes may be supported and securely clamped in the same V-shaped supports.

In the accompanying drawings I have shown only such parts as are necessary to illustrate the character of my present invention, the mechanism for rotating the grinding wheel being omitted.

In the accompanying drawings,

Fig. 1 represents in side elevation my reamer supporting device, with a reamer held therein, showing in broken lines the position of the grinding wheel.

Fig. 2 is a plan view of the reamer and its support.

Fig. 3 is an end view of the front V-shaped support.

Fig. 4 is an end view showing the rear V-shaped support, with the reamer shown in sectional view on the plane of the broken line 4-4, Fig. 1.

Fig. 5 is an end view of the reamer clamping mechanism illustrating the adjustment for holding reamers of different sizes without changing the V-shaped supports.

Similar reference characters refer to similar parts in the different figures.

Referring to Fig. 1, 1 denotes the reamer having a cylindrical section 2, upon which the cutting teeth are formed, the teeth, however, being omitted in the different views. The reamer is provided with a cylindrical section 3, upon its front end, and a similar cylindrical section 4 upon its opposite end, and having a square section for the application of a wrench. The cylindrical sections 2 and 3 are of the same diameter, and the cylindrical section 2 is supported in a V-shaped support 5 adjustable on a table 6. The cylindrical section 3 is supported upon a similar V-shaped support 7 having a projection 8 to which is fastened a gage plate 9 by means of a clamping screw 10. The gage plate 9 is vertically adjustable on the projection 8, with its upper end in contact with one of the teeth 11 of the wrench 12. The V-shaped supports 5 and 7 are adjustable along the table 6 and are held in their adjusted position by the clamping screws 12 and 13. To each of the V-shaped supports is attached a clamping mechanism, consisting of the vertically adjustable bar 14 curved at 15 to extend over the V-shaped support, and slotted at 16 to carry a clamping fork 17 adapted to rest upon the cylindrical sections 2 and 3 of the reamer, said fork having a screw threaded shank 18, carrying a check nut 19, which is screwed tightly against the under side of the adjustable bar 14 when the fork 17 has been brought against the reamer.

Fig. 5 represents the adjustment in the V-shaped support and its clamping mechanism to receive reamers of different diameters, the cylindrical section 9 resting directly in the V-shaped support 5, showing the largest size capable of being held in the support. When smaller sizes are to be ground, blocks 20, 21 and 22 are inserted and held by a screw 23 entering the block 20. The blocks 21 and 22 are provided with dowel pins 24 and 25 entering holes in the blocks 20 and 21, the circle 26 representing a reamer of smaller diameter. In Fig. 1, the broken lines 27 represent the position of a cup shaped grinding wheel, such as are usually employed in grinding reamers of this class. The reamer is hollow as shown by the broken lines 28. Fig. 1, the interior being provided with a tapered surface fitting a tapered plug 29, having a neck 30 and a screw 31 threaded section 31 fitting a screw threaded hole in the cylindrical section 2, and pro-
vided with a flattened tip 32 by which the tapered plug 29 may be screwed into the reamer to expand the cutting teeth when the latter become worn, in order to maintain the desired diameter of the reamer when the teeth have been ground.

I am aware that V-shaped supports have heretofore been employed for supporting articles of various kinds, and I do not claim such broadly, nor do I claim broadly a clamping device by which articles are held in such supports.

The operation of grinding an expanding reamer and preserving its diameter is one of great delicacy, requiring extreme accuracy, often within the thousandth part of an inch, and so far as I am aware no device has been proposed capable of accomplishing this result, which I accomplish by means of my present invention. Screw threaded clamps have been proposed for holding articles in a V-shaped support, but in such clamping devices, while employing a forked clamp having a screw threaded shank, the upward strain is received by the shank, but in my construction the upward strain upon the clamp is received by the check nut bearing against the under side of the curved bar 14.

Attached to the base of the V-shaped support 7 is a stop 33 extending upwardly to contact with the end of the reamer and hold it from longitudinal movement.

I claim,

1. A support for a reamer of the class described, during the operation of grinding, comprising a pair of V-shaped supports spaced apart and adjustably supported in alinement with each other, a slotted clamping bar attached to each of said V-shaped supports and vertically adjustable, and a screw threaded forked clamp held in said slotted bar, carrying a check nut to prevent its upward movement.

2. A support for a reamer of the class described, during the operation of grinding, comprising a pair of V-shaped supports spaced apart and adjustably supported in alinement with each other, with one of said V-shaped supports provided with an adjustable guide for limiting the rotative movement of the reamer, and a stop for limiting the endwise movement of the reamer.

3. In a support for a reamer of the class described, the combination with a V-shaped support, of a clamping device comprising a vertically adjustable bar curved to extend horizontally over a reamer, with a slot in its horizontal extension, a forked clamp provided with a screw threaded shank passing through said slot, and a check nut held on said shank and bearing against the under side of said horizontal extension.

GEORGE L. WOOD.