D. H. SHATTUCK.

BORING BAR.

APPLICATION FILED SEPT. 23, 1907.

922,346. Patented May 18, 1909.

Fig. 3.

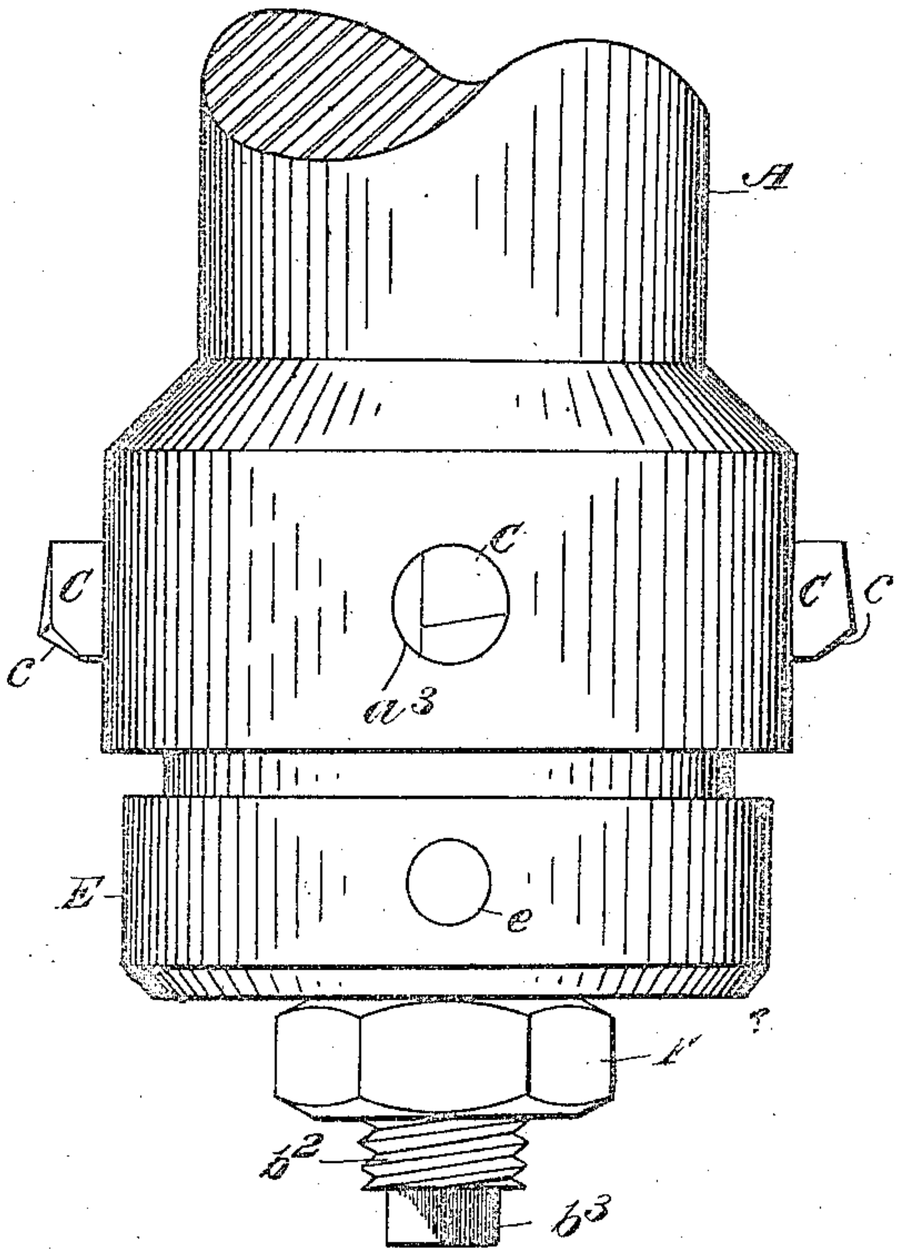
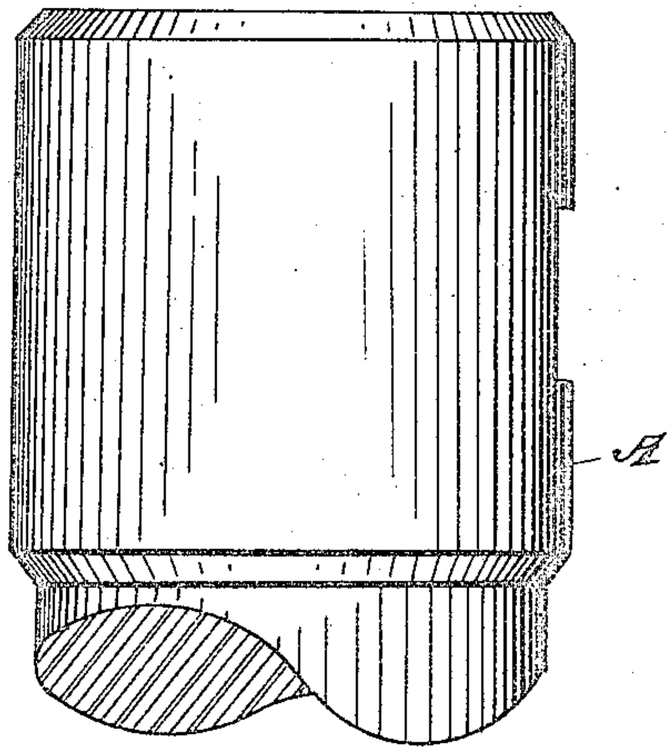


Fig. 1.



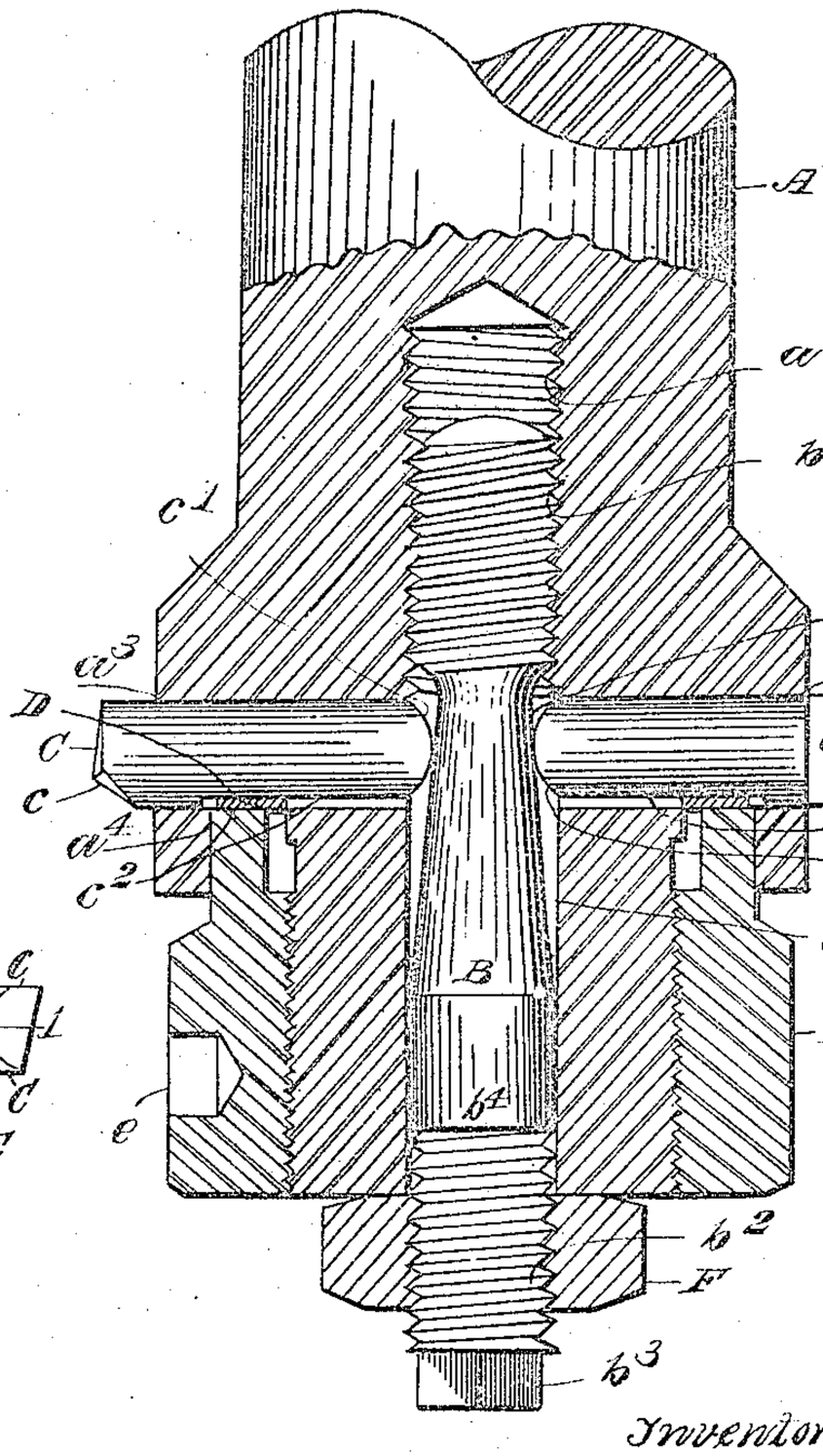
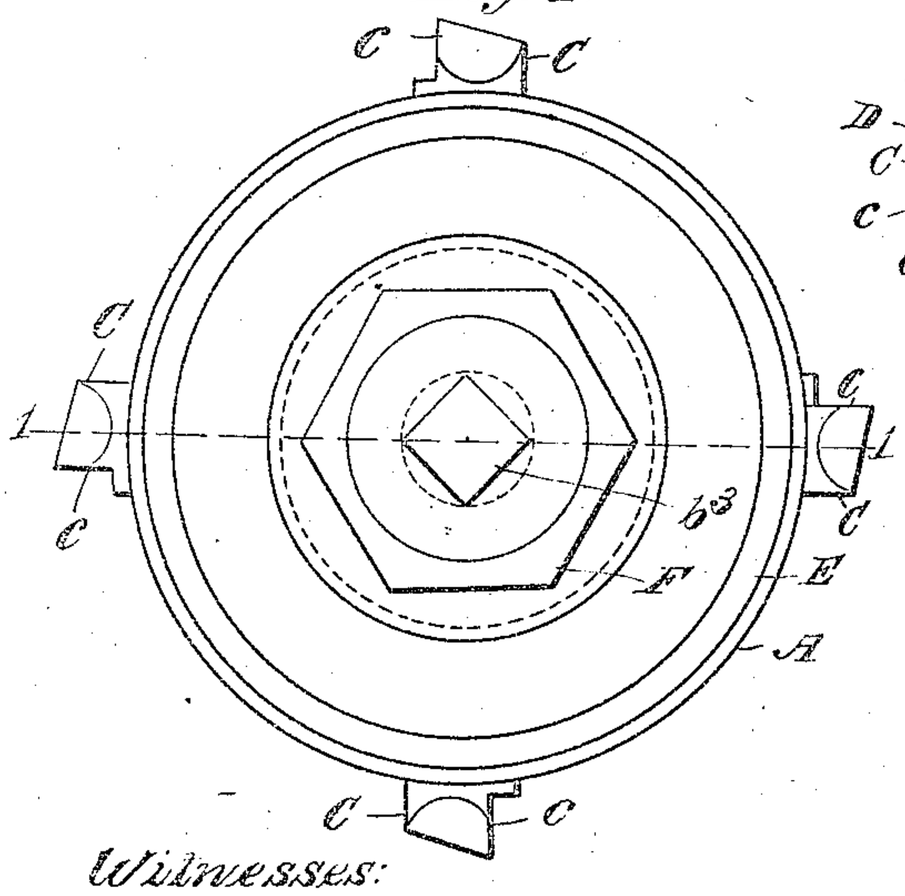


Fig. 2.



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UNITED STATES PATENT OFFICE.

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BORING-BAR.

No. 922,346. Specification of Letters Patent. Patented May 18, 1909.

Application filed September 23, 1907. Serial No. 394,123.

To all whom it may concern:

Be it known that I, DAVID H. SHATTUCK, a citizen of the United States, residing at Westford, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Boring-Bars, of which the following is a specification.

This invention relates to boring bars or bars to which are secured cutters or cutting bits and adapted to be used in horizontal or vertical boring-mills or machines or in other usual ways.

The object of this invention is to provide means for accurately and quickly adjusting the cutters to bore holes of different sizes and for rigidly holding the cutters without the use of set-screws or keys.

Heretofore it has been customary to use a single cutter in the bar by means of a key or set-screw. The driving in of the key is apt to spring the bar and to displace the cutter and where a set-screw is used it is necessary to "spot" or to make a depression in the cutter to receive the point of the screw, so that if the cutter is subsequently ground, it is difficult to get a new spot or hole to receive the set-screw without materially reducing the size of the hole to be bored, that is, a very slight reduction of the cutting diameter of the boring-bar cannot be made. Sometimes a "double-header" or cutter shaped to cut at both ends and extending through the bar to an equal distance from the center of the bar on each side is held in a similar manner by a radial set-screw arranged at right-angles to the cutter. It is obvious that when such a double header is reground or sharpened to any extent, it is only suitable for boring a smaller hole than before.

By the use of my invention I am able to produce a cutter-bar which may be used to bore the same sized hole, although the cutters are many times reground. I am also able to utilize very short stock in the making of the cutters, that is, pieces so short that they could not be utilized in cutter-bars heretofore. By the use of this cutter-bar without removing the cutters I can vary the cutting diameter within a considerable range, that is, I can reduce the cutting diameter and subsequently enlarge said cutting diameter while retaining the same cutters.

With the very hard tool-steel now much used and sometimes called "self-hardening steel" it is impossible to "spot" the cutters or drill the holes for the reception of the set-screw, such steel being affected only by grinding with emery or other abrasives. This invention makes the use of cutters of the most refractory steel feasible.

In the accompanying drawing, Figure 1 is a side elevation of a boring-bar provided with my improvement, the shank or bar proper being broken out to save space in the drawing and the lower end of the bar being in central vertical section on the line 1—1 in Fig. 2; Fig. 2, a plan of the bottom of the cutter-bar; Fig. 3, a side elevation of the part of the bar which in Fig. 1 is shown in section.

The bar proper A is of the usual form, except as hereinafter stated, and is usually held stationary in the vertical position shown in Fig. 1, in a boring-mill or machine while the work revolves below in a horizontal plane, but said bar may be held in the tail-stock of a lathe while the work is revolved by a chuck in the head-stock or the bar may be used in the usual horizontal chucking machines.

In the lower or operative end of the bar A is arranged a central hole a, in which turns an adjusting screw-cone B provided with an intermediate conical part b, two externally screw-threaded portions b^1 b^2 and a cylindrical guiding section b^4 which has a sliding fit in the hole a, the screw b^1 engaging an internal screw-thread a^1 in the hole a, and the screw b^2 receiving the nut F named below. The outer end b^3 of the screw-cone B is square or many-sided to be engaged by a wrench.

The bar proper A is provided with a plurality of radial cylindrical holes a^3 lying in the same radial plane at equal angular intervals from each other.

In the holes a^3 are arranged cutters C having cylindrical shanks, the outer or cutting parts c of which may be of any suitable shape and the inner ends c^1 of which are suitably rounded or curved to allow the cone B, with which they are in contact, to move easily. The cutters are each provided with a flattened side c^2 to fit the washer D, which rests on said flattened sides and is pressed against them by the nut E, which turns on the externally threaded reduced lower end of the shank or bar proper A, said nut E being represented as provided with a radial hole e to

be engaged by a spanner or hand-spike. The amount of projection of the cutters from the bar A is determined by the diameter of the cone B where the inner ends of said cutters are in contact with said cone. When the nut E is loosened, turning the cone B farther into the handle A throws the cutters outward, but when the cone is turned in the other direction, the cutters are pushed in against the cone. When the cone B is adjusted to the proper position to secure the desired projection of the cutters, said cone is prevented from being accidentally turned by a check-nut F which turns on the lower screw-threaded part b^2 of the screw-cone B against the lower end of the bar proper A. The upper or inner end of the nut E is reduced to enter and fit an annular groove a^4 in the bar proper A to box up and protect from dirt the adjustable parts of the boring-bar.

I claim as my invention:—

1. The combination of a bar having an external screw-thread and having radial cylindrical holes, cutters having cylindrical shanks arranged in said holes and each provided with a flattened surface, and a nut arranged on said bar and adapted to engage the flattened surfaces of said cutters to hold the latter.

2. The combination of a bar having radial cylindrical holes, cutters having cylindrical shanks arranged in said holes and each provided with a flattened surface, said bar being provided with an annular groove concentric with its axis and said groove intersecting said radial holes, and a nut arranged on said bar and in said groove and adapted to engage said flattened surfaces to hold said cutters.

In witness whereof, I have affixed my signature in presence of two witnesses.

DAVID H. SHATTUCK.

Witnesses:

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GRACE CROWLEY.