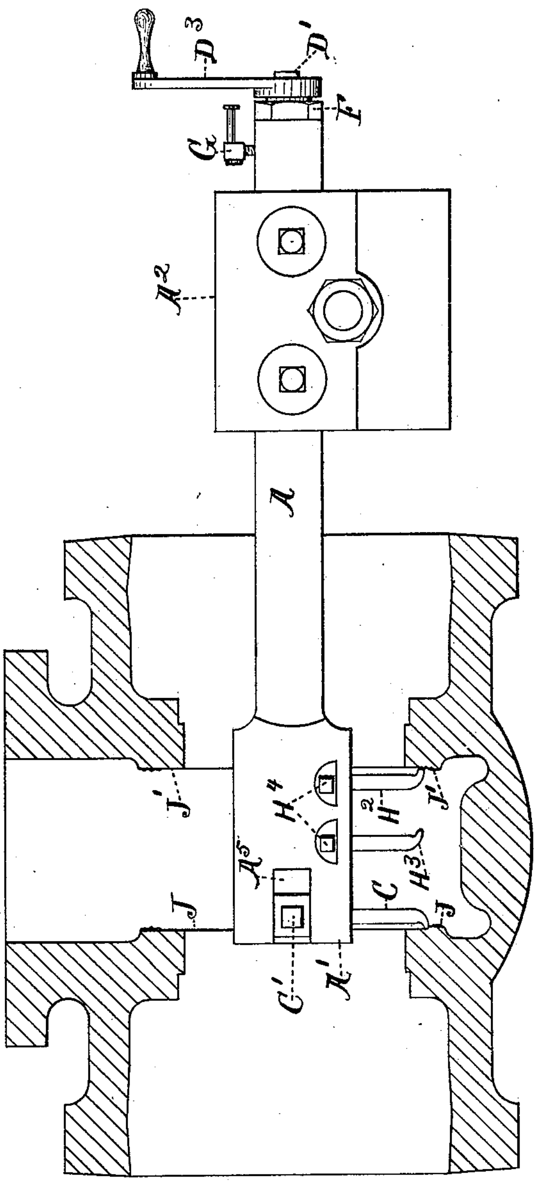
(No Model.) 3 Sheets—Sheet 1.

J. STONE.

ADJUSTABLE MULTIPLE CUTTER BORING BAR.

No. 403,154. Patented May 14, 1889.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

J. STONE.

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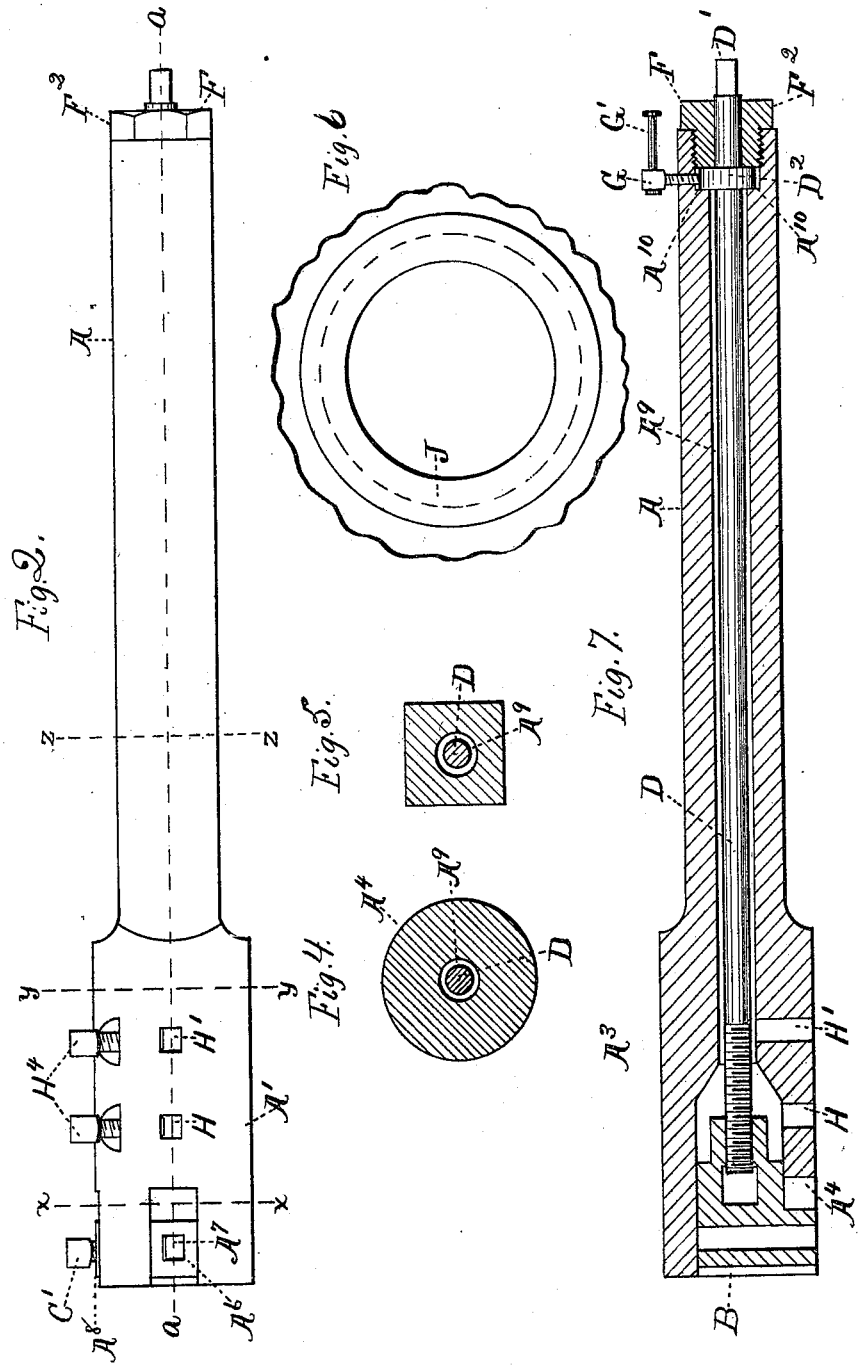
No. 403,154. Patented May 14, 1889.



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(No Model.) 3 Sheets—Sheet 3.

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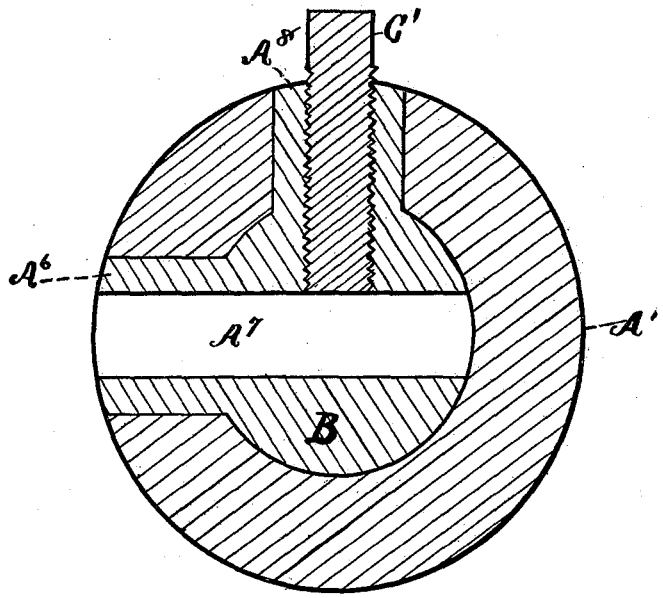
ADJUSTABLE MULTIPLE CUTTER BORING BAR.

No. 403,154. Patented May 14, 1889.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JABEZ STONE, OF WATERFORD, NEW YORK.

ADJUSTABLE MULTIPLE-CUTTER BORING-BAR.

SPECIFICATION forming part of Letters Patent No. 403,154, dated May 14, 1889.

Application filed August 4, 1888. Serial No. 281,924. (No model.)

To all whom it may concern:

Be it known that I, JABEZ STONE, a resident of Waterford, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Adjustable Multiple-Cutter Boring-Bars; and I do hereby declare that the following is a full, clear, and exact description of the invention, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

My invention relates to improvements in adjustable multiple-cutter boring-bars; and it consists of the novel construction and combination of parts hereinafter described, and pointed out in the claims.

Figure 1 of the drawings is a side elevation of my improved bar and a section of a valve-case, the bar being shown in position for simultaneously working in opposite directions upon two faces of the case. Fig. 2 is a plan view of the boring-bar, detached when viewed from the bottom, as shown in Fig. 1. Fig. 3 is a vertical cross-section of the parts shown in Fig. 2, taken centrally of the binding-screw C′, and upon a considerably enlarged scale. Fig. 4 is a similar section taken on the broken line *y y* in Fig. 2. Fig. 5 is a similar section taken on the broken line *z z* in Fig. 2. Fig. 6 is a front elevation of one of the valve-faces shown in Fig. 1, with the other portions of the valve-case broken away. Fig. 7 is a central longitudinal section of the boring-bar, taken on the broken line *a a*, Fig. 2. Figs. 1 and 6 are drawn upon the same scale, and all the remaining figures upon an enlarged and uniform scale.

My improved boring-bar is adapted for use in a lathe or upright boring-mill or other similar machine. It is preferably made with a square or rectangular shank, A, provided with a circular head, A′. The rectangular shank is adapted to fit and be fixed in the tool-post of a lathe, mill, or other machine, or in a special block or saddle, A^2, attached to the carriage of the machine. The circular head is provided with a central longitudinal bore, A^3, adapted to receive a traveling tool-carriage, B. The circular head is also provided with the radial slots A^4 and A^5, extending from said central bore outward, adapted to receive and form a slideway for radial lugs projecting from the traveling tool-carriage, the lug A^6, adapted to slide in the slot A^4, being provided with the tool-socket A^7, adapted to receive the tool C, and the lug A^8 being provided with a threaded aperture intersecting the tool-socket, adapted to receive the tool-binding screw C′, which screw serves to hold the tool in place in its socket. The rectangular shank A is also provided with a central longitudinal bore, A^9, extending from the bore in the circular head through the opposite end of the shank.

The traveling tool-carriage B is provided with a threaded central aperture adapted to receive a similar threaded stem, D, when inserted in the longitudinal bore A^9. The stem is of sufficient length to engage at its threaded end with the carriage, while the other end of the stem projects from the other end of the shank. The projecting end of the stem is provided with means for imparting to it a rotary movement, as rectangular stud D′, adapted to receive the socket-wrench D^3. This end of the stem is also provided with a collar, D^2, fixed thereon.

The corresponding end of the shank A is provided with an enlarged bore, forming the shoulder A^{10}, which shoulder forms a seat for the collar D^2. The enlarged bore is also threaded and adapted to receive a correspondingly and exteriorly threaded nut, F.

The nut is centrally perforated to receive the end of the stem, and is also provided with flange F^2, adapted to engage with the end of the shank A, and so arranged that when the nut is screwed into the end of the shank until the flange F^2 engages therewith the inner end of the nut will just come in contact with the collar D^2 on one side without binding tightly thereon when the other side of the collar is in engagement with the shoulder A^{10}, as shown in Fig. 7. The threaded binding-screw G, provided with an operating-handle, G′, is made to fit a correspondingly-threaded radial aperture in the shank at a point op-

posite the collar, whereby the stem and the collar may be prevented from rotating when the screw G is turned to bind thereon. The circular head may also be provided with any desired number of tool-sockets. I have shown two sockets, H and H′, adapted to receive the tools H^2 and H^3, which tools are secured in their respective sockets by the binding-screws H^4.

The object of the invention is, in facing, chasing, or performing other similar work upon metals, to work two or more cutting-tools mounted upon a common boring-bar in opposite directions upon different parallel faces—as, for example, tools C and H^2 upon the two opposite and parallel faces J J′ in the interior of the valve-case shown in section in Fig. 1, being shown located to cut on the dotted line in Fig. 6.

The operation of the device is as follows: The bar is first adjusted in the saddle A^2 in the usual manner, so that the tool H^2 will work against the face J′. The tool C, secured in the traveling carriage B, is then adjusted to work against the opposite and parallel face J by means of the wrench D^6, the latter being released by unscrewing the binding-screw G. By turning the stem D to the right the carriage is drawn toward the collar D^2, the latter bearing upon the shoulder A^{10}, and by turning the stem to the left the carriage is forced to travel from the collar, the latter bearing upon the inner end of nut F, as before expained. It will thus be seen that the cutter is adjustable longitudinally of the bar and independently of the adjustment of the latter or of the cutters stationary thereon. The cutter C is securely locked in its adjusted position by means of the binding-screw G, operated to bear against collar D^2, as before explained.

Different sizes of the boring-bar may be employed, and the distance apart of the stationary tool-slots may be so proportioned to the travel of the carriage as to afford any required spacing of the tools—for example, when working upon the faces J J′ it is evident the tool H^3 could be removed as superfluous, and if the faces were so near together that the tool H^2 and the tool C could not be inserted between them by reason of the limited travel of the tool-carriage, then the tool H^2 could be removed from the socket H′ and inserted in the socket H. (Shown in Fig. 1 as occupied by tool H^3.)

I am thus able to double the capacity of the boring-bar in performing the kinds of work described without materially adding to the expense of operating it.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a multiple-cutter boring-bar, a stationary fixed bar provided with a tool-socket, in combination with a tool-carriage for carrying a separate tool, movably supported by such fixed bar and adjustable longitudinally thereon, for the purpose of simultaneously cutting two interior faces, substantially as described.

2. The combination, in a multiple-cutter boring-bar, of a shank, A, head A′, provided with tool-sockets H, tool-carriage B, movably mounted upon the head, carriage-adjusting stem D, and means for locking the adjusting-stem, as binding-screw G, substantially as described, and for the purpose of simultaneously working two cutting-tools upon the opposite faces of a straight-way valve.

In testimony whereof I have hereunto set my hand this 1st day of August, 1888.

JABEZ STONE.

Witnesses:

GEO. A. MOSHER,

W. H. HOLLISTER, Jr.