(No Model.) 2 Sheets—Sheet 1.

# J. WARREN.

## STONE CUTTING TOOL.

No. 254,520. Patented Mar. 7, 1882.

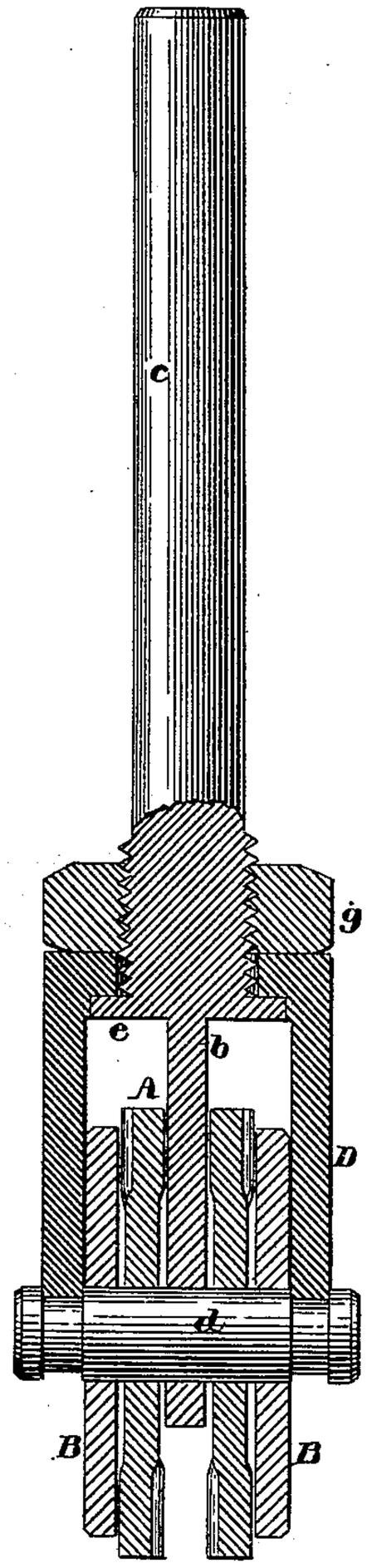


Fig. 3.

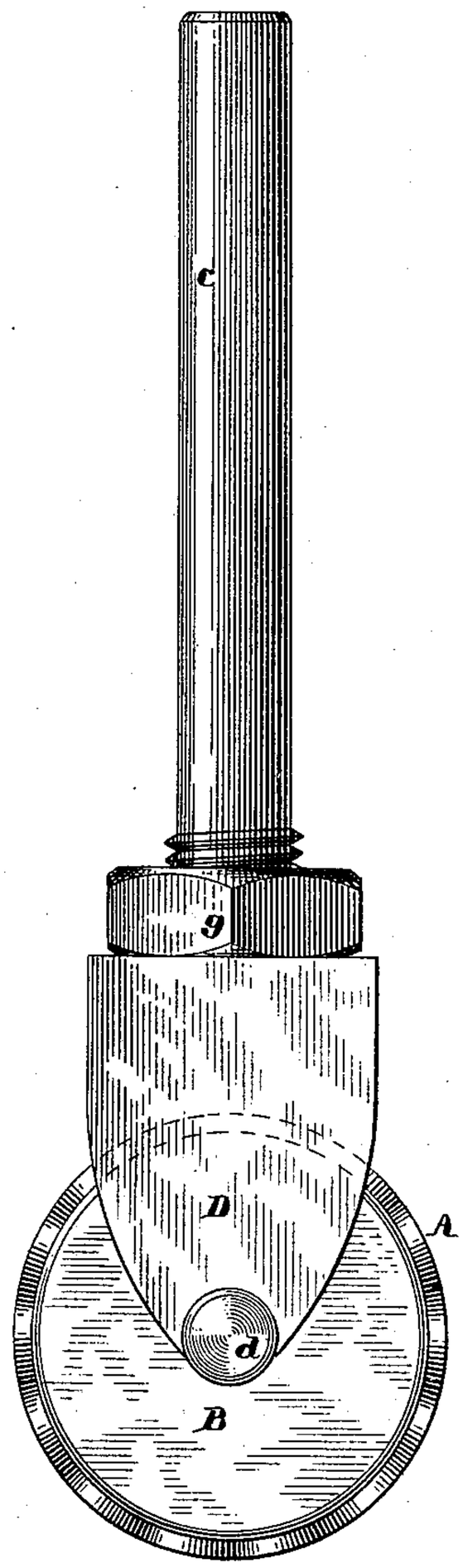


Fig. 1.

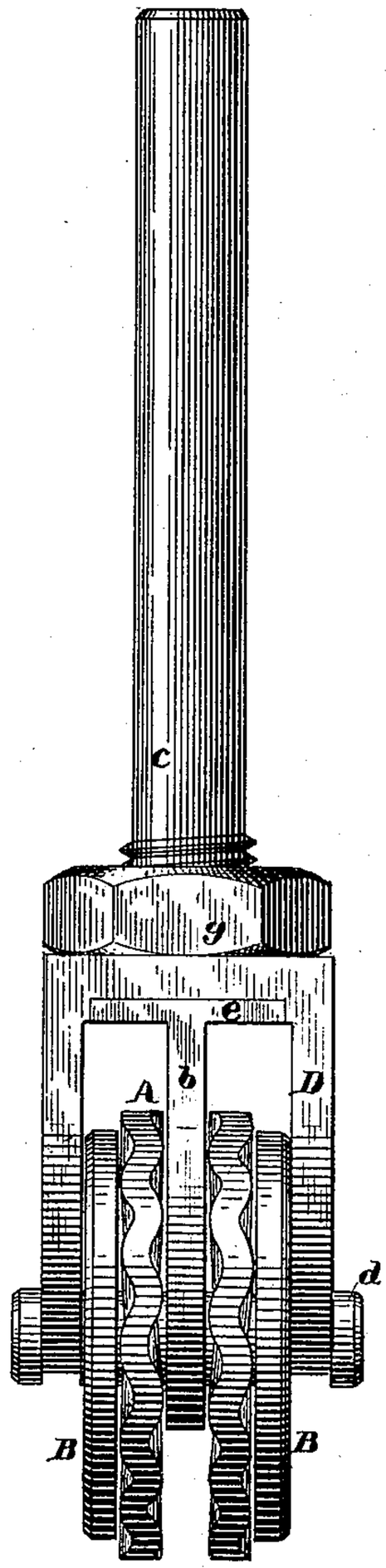


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

# J. WARREN.

## STONE CUTTING TOOL.

No. 254,520. Patented Mar. 7, 1882.

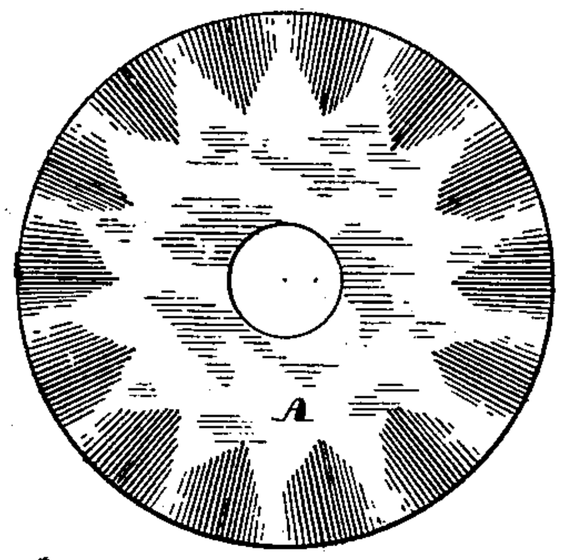


*Fig. 7.*

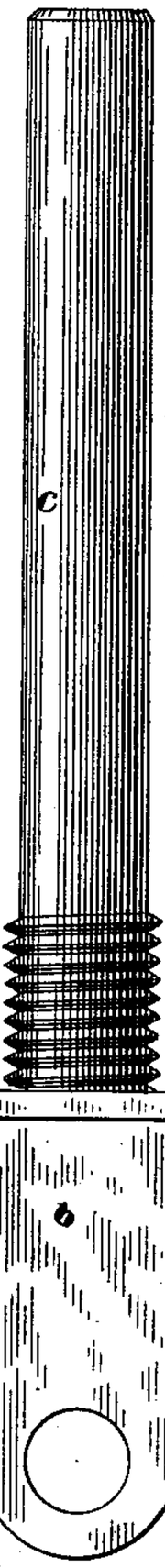


*Fig. 4.*

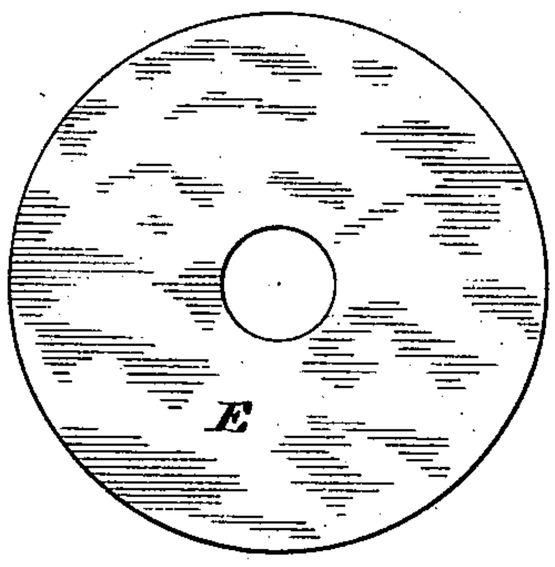


*Fig. 8.*

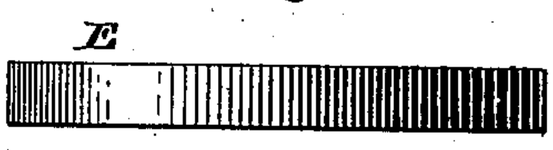


*Fig. 9.*

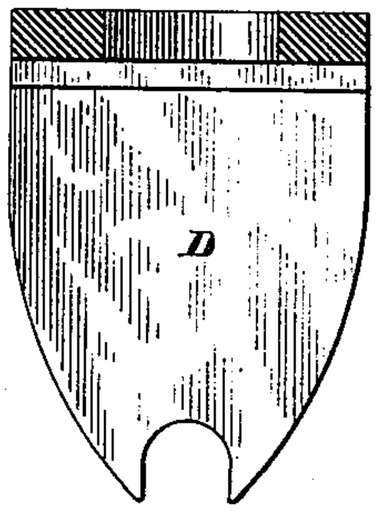


*Fig. 6*

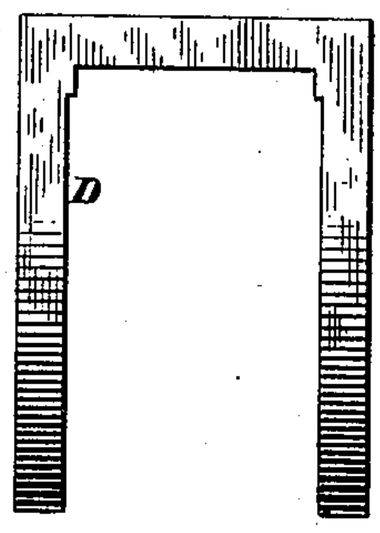


*Fig. 5.*

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**Inventor:**
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# UNITED STATES PATENT OFFICE.

JOHN WARREN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO OSCAR L. NOBLE, TRUSTEE, OF SAME PLACE.

## STONE-CUTTING TOOL.

SPECIFICATION forming part of Letters Patent No. 254,520, dated March 7, 1882.

Application filed August 17, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WARREN, formerly of Detroit, Michigan, but now of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stone-Cutting Tools, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a tool for dressing and paneling stone, and finishing the edges thereof, and belongs to that class in which disks are used as the immediate cutting part of the instrument.

Heretofore disks have been suggested for the cutting parts of stone-dressing instruments having one side cut or formed with radial grooves and with a beveled periphery to form a sickle-edge. These cutters, however, wear rapidly and break, and require such frequent regrinding as to be impracticable. The force necessary for such a stone-cutting tool is also such, and the rate of speed at which it is driven so great, that the head or parts which hold the disks must be very simple and strong. Unless the pieces are held perfectly secure there is danger that they will fly out and strike the workmen. Nuts, with the great speed required for this work, upon the ends of the pin on which the disks are held cannot be kept tight.

The object of my invention is therefore, first, to improve the cutting-disks and render them more durable and efficient, and, second, to simplify the head in which they are held and render it stronger and more secure.

Figure 1 of the drawings is a side elevation of my improved stone-cutting tool. Fig. 2 is an edge view. Fig. 3 is a vertical section on line *x x* on Fig. 1; and Figs. 4, 5, 6, 7, 8, and 9 are details, to be hereinafter referred to.

The improved disk A (shown in Figs. 1, 2, 3, and 7) is made with symmetrically-arranged radial grooves on each side, the ridge on one side of the disk being opposite a depression on the other, forming substantially a series of radially-arranged corrugations, as shown in Fig. 2. The periphery of the disk is substantially cylindrical, having undulating sharp edges on each side, the operation of which on the stone is hereinafter described. Preferably I form the center of the disk on each side flat or with smooth parallel surfaces contiguous to the sides of the collars B B and the plate *b* of the spindle *c*, between which the disks revolve. These disks may be struck out of steel, or any suitable material, in suitable dies, and then properly tempered. The disks are placed in the head, as shown in Figs 1 and 3. This head consists of a central plate or hanger, *b*, which is fixed to or forms a part of the spindle *c*. The lower end is bored transversely to admit the pin *d*, on which the disks are placed. This pin is cylindrical, and is designed to turn freely in its bearings in the head. It is made to fit closely the hole in the plate *b*, and is turned down near the ends to form necks, as shown in Fig. 3, to fit smaller half-round bearings in the slotted ends of the yoke *d*. (Shown in Figs. 5 and 6.) The central plate or hanger *b* is arranged central with the axis of the spindle *c*, which is provided with the rectangular collar *e*, which fits closely between the two side jaws of the yoke D. The parts are put together by inserting the pin *d* in the hole in the plate or hanger *b*, so that it will project out equally from each side thereof, then placing on said pin the disks and collars, and then passing the spindle up through a hole in the upper part of the yoke till the collar *e* is brought up snugly to its bearings inside the yoke. The parts are so fitted that this movement will bring the half-round notches in the ends of the yoke upon the turned-down bearings of the pin, thus holding the pin securely in place against any lateral movement, and also preventing the yoke from spreading or being thrown out of shape by the tendency of the disks to move outward toward the ends of the pin, caused by the rapid rotation and the resistance presented by the stone, and also allowing it to turn freely in its bearings. This obviates the necessity for nuts on the ends of the pin, and permits the pin to turn in the bearings, as well as the disks to turn on the pin, which is a great advantage, since when the disks turn on fixed pins the twist caused by the rotation of the head against the resistance of the stone causes the corners of the bearing-surfaces of the disks to cut grooves in the pins, and thereby speedily destroy them, and also crumbles the corners of

the bearing-surfaces of the disks which rest upon the pins, and renders them speedily worthless.

Instead of the washers B B, the disks may be formed with bosses upon their sides.

The two jaws of the yoke and the central flange may extend down below the pin, in order to give stability to the disk. This construction is very simple and is perfectly secure.

A nut, *g*, passing over the threaded portion of the spindle, holds the yoke down and secures all the parts together, thus rendering the head easy to be taken apart or put together, and leaving no part liable to displacement when at work.

Any number of disks may be used; but I have found it sufficient and better to use only two disks, as I make them. They are formed with a smooth periphery, and when subjected to wear they are naturally worn more rapidly on the outer side. As both sides of the disk are alike, it will be understood that while the outer edge is subjected to wear by the rotation of the head the same operation restores the edge on the inside of the disk, and when the outer edge has become dulled the disks may be reversed, the tool being thus made self-sharpening and at the same time of double cutting capacity. The grooves or corrugations aid in giving rotation to the disks, and also operate more effectually in cutting away the stone, as the action is somewhat in the nature of a drawing-cut. For some kinds of work, however, I prefer to use a plain disk, E, having a cylindrical periphery and plain flat sides, as shown in Figs 8 and 9, which has been found to work well, particularly for giving a fine finish to the stone after the surface has been partially dressed, and said disk has the same advantage of being self-sharpening.

The tool is connected by means of the spindle to any suitable stock, which is rotated at a high speed. As the disks are outside of the central axial line of this stock, the rotary motion of the tool causes said disks to rotate upon their axes, thus bringing every part of their periphery successively and equally into contact with the stone, and causing equal and uniform wear.

Having thus described my invention, what I claim is—

1. A stone cutting or dressing instrument consisting of one or more disks having plain cylindrical peripheries and mounted loosely upon and adapted to be revolved about a pin or shaft placed at right angles to the spindle and adapted to be revolved in its bearings, said disk or disks being arranged upon one or both sides of the axial line of said spindle, substantially as described.

2. A stone cutting or dressing instrument consisting of disks corrugated on both sides and mounted on and adapted to be revolved about a pin or shaft placed at right angles to the spindle and adapted to be revolved in its bearings, said disks being arranged symmetrically on each side of the axial line of the said spindle, substantially as described.

3. In combination with the yoke D, having slotted ends, the perforated central plate, *b*, of the spindle *c*, and disks having smooth cylindrical peripheries, the pin *d*, having enlarged center and reduced bearings near its ends, substantially as described.

4. In a stone-cutting tool, a head composed of the spindle *c*, provided with the plate *b*, having a transverse opening, the collar *e*, and male screw-thread, the yoke D, provided with central hole to receive the spindle *c*, and slots to receive the disk-bearing pin, and the nut *g*, all arranged and adapted to operate substantially as described.

5. The central perforated plate, *b*, integral with the spindle, in combination with the pin *d*, one or more cutting-disks, and the yoke D, said yoke having a central perforation for the spindle and slots for the pin, substantially as described.

6. The combination of the pin *d*, plate *b*, yoke D, disks A, and collars B B, substantially as described.

Executed at Boston, Massachusetts, United States of America, this 13th day of August, A. D. 1881.

JOHN WARREN.

Witnesses:
E. A. HEMMENWAY,
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