

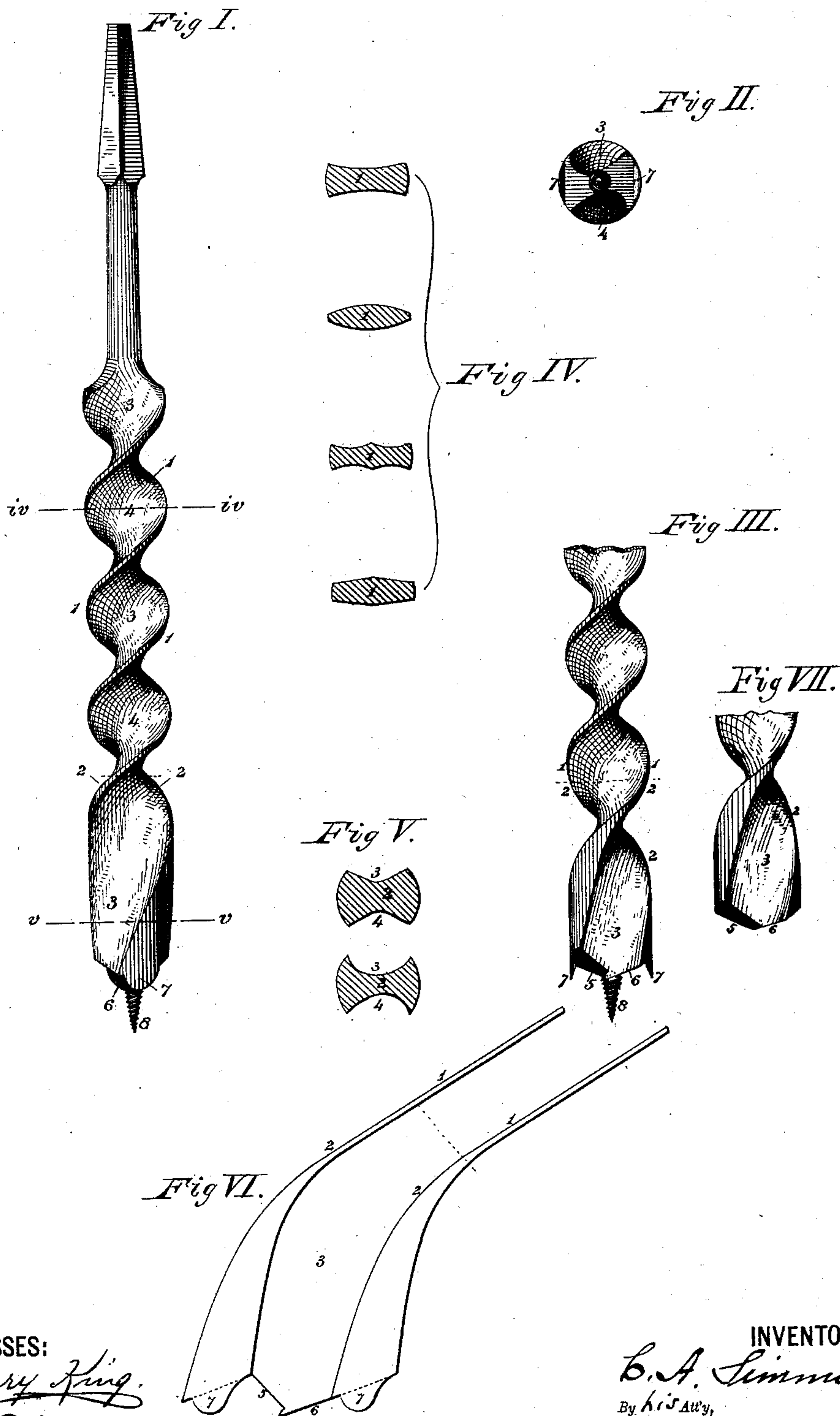
(No Model.)

C. A. SIMMONS.

BORING TOOL.

No. 374,432.

Patented Dec. 6, 1887.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CLARENCE A. SIMMONS, OF NORWOOD, MASSACHUSETTS.

BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 374,432, dated December 6, 1887.

Application filed December 27, 1886. Serial No. 222,674. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE A. SIMMONS, a citizen of the United States, residing at Norwood, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Boring-Tools, of which the following is a specification.

This invention relates to certain improvements in augers or boring-tools which are adapted for boring in different woods, in metal, or in stone.

The object of the invention is to provide an auger or boring-tool which shall be strong and durable, and which will freely discharge the material bored out, and which will be less liable to run or deviate from the right line when used with the grain of the wood or diagonally to it, and one, also, which will last much longer and which can always be kept sharp by grinding the cutting-edges. I attain this object by means of the device illustrated in the accompanying drawings, forming a part of this specification, and in which—

Figure I is an elevation of this improved auger provided with a central pin or worm, and with scoring cutters or spurs which especially adapt it for use in boring wood. Fig. II is a plan of the cutting end of this improved auger. Fig. III is an elevation of a portion of this improved auger of the form illustrated in Fig. I, but at a quarter-turn from the position shown therein. Fig. IV represents cross-sections of the auger on the line *iv iv* of Fig. I, according to the construction which is adopted. Fig. V illustrates different forms of transverse sections taken on the line *v v* of Fig. I, according to the construction adopted for the lower section of the auger. Fig. VI is a diagram illustrating one of the clearance-grooves developed in a plane, instead of being wound helically around the auger. Fig. VII shows the lower end of this improved auger provided with an ordinary drill-point, the worm and spurs being omitted. The same numerals of reference have been applied to corresponding parts in the several figures of the drawings.

The shaft of this improved auger is of cylindrical or any other desired construction, and is preferably provided at its upper end with an ordinary angular tapered shank adapted to fit the socket of a brace or bit-stock; or it may

be provided with a handle or other means for turning it in the direction desired.

The twisted blade of this improved auger comprises an upper portion, 1, having a regular or uniform twist, and a lower portion, 2, having an irregular twist, or a twist of greater pitch than that of the upper portion. The cross-section of the upper portion or regular twist is of any suitable form, size, or thickness, several forms being illustrated in Fig. IV. The blade of the auger at the irregular twist is thicker at the periphery than at the center, and may be of different forms, two variations being illustrated in Fig. V.

The auger is provided with two delivery-grooves, 3 4, which gradually widen from the cutters upward, preferably through the irregular to the regular twist, in which they are of uniform width. The delivery-grooves may be of uniform width through the lower section of the auger, if desired. It will be obvious that the steep pitch of the grooves near the cutters will cause the chips to be lifted rapidly away from said cutters into the grooves of regular pitch and of easier grade above, through which they will be conveyed upward and discharged at the mouth of the hole being bored as rapidly as may be necessary; and when the delivery-grooves are gradually widened from the cutters upward, as stated, clogging is prevented and the auger or drill does better work. The blade of the auger at the irregular twist, being thicker at the periphery than at the center, presents a greater bearing-surface to the grain of the wood, thus keeping it true and steady to its course, especially when used with the grain of the wood or diagonally to it. The peculiar construction of the twisted blade of this improved auger and of the grooves formed therein thus adapt it to boring in wood, metal, or stone with great rapidity and facility.

The floor lips or cutters 5 and 6 may be either horizontal or inclined; but I prefer to make them inclined toward the sides. They present slightly concave or convex or straight cutting-edges to the work, as may be desired, and extend tangentially from the root of the worm 8 to the circumference of the auger. The cutters are preferably beveled or cut away in the rear of the cutting-edge to render the latter sharp.

On the end of the auger and upon the edges

of the blades, slightly in the rear of the cutters, are formed downwardly-projecting spurs 7, which serve the ordinary function of circularly incising the material being bored. I may, however, if desired, dispense with either of the spurs 7 or the worm 8, or both; but when the worm, or both the worm and spurs, are dispensed with the cutting-edges should be shaped, by grinding or otherwise, as shown in Fig. VII.

An auger constructed as hereinbefore described possesses the advantages of rapidly clearing the hole being bored of chips, of operating either across, diagonally to, or in line with the grain of the wood or through knots or other obstacles therein, and of being readily ground when dulled by long continued use.

If by long use the auger or drill becomes smaller in circumference at its lower end than at the regular twist, it can be enlarged by swaging it at the center of the delivery-grooves 3 and 4.

The lower section of this improved auger can be made of any length desired, and when it is constructed without a worm or spur, as shown in Fig. VII, may be ground and used as long as this portion of the auger will last.

I claim as my invention—

1. A boring-tool comprising a twisted blade and cutters at the lower end thereof, said blade in its lower part being thicker at its periphery than at its center, and having two spiral delivery-grooves the pitch of which is greater at the lower than at the upper part of the blade, substantially as described.

2. A boring-tool comprising a twisted blade and cutters at the lower end thereof, said

blade in its lower part being thicker at its periphery than at its center, the thickness gradually increasing toward the cutters, and having two spiral delivery-grooves, the pitch of said grooves increasing and the width thereof decreasing toward the cutters, substantially as described.

3. A boring-tool comprising a twisted blade and a worm and cutters at the lower end of the blade, said cutters being provided with spurs slightly in the rear of their cutting-faces, and said blade in its lower part being thicker at its periphery than at its center, and having two spiral delivery-grooves the pitch of which is greater at the lower than at the upper part of the blade, substantially as described.

4. A boring-tool having a spiral delivery-groove, the lower part of said spiral groove being of steeper pitch than the upper part thereof and said groove being gradually widened from the cutter upward, substantially as described.

5. A boring-tool having a twisted blade forming two spiral clearance-grooves, said grooves being of uniform pitch at the upper part of said tool and of an increasing pitch from the lower end of said uniform pitch to the cutters, the spiral delivery-grooves being gradually decreased in width from said uniform pitch to the cutters, substantially as described.

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Witnesses:

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