

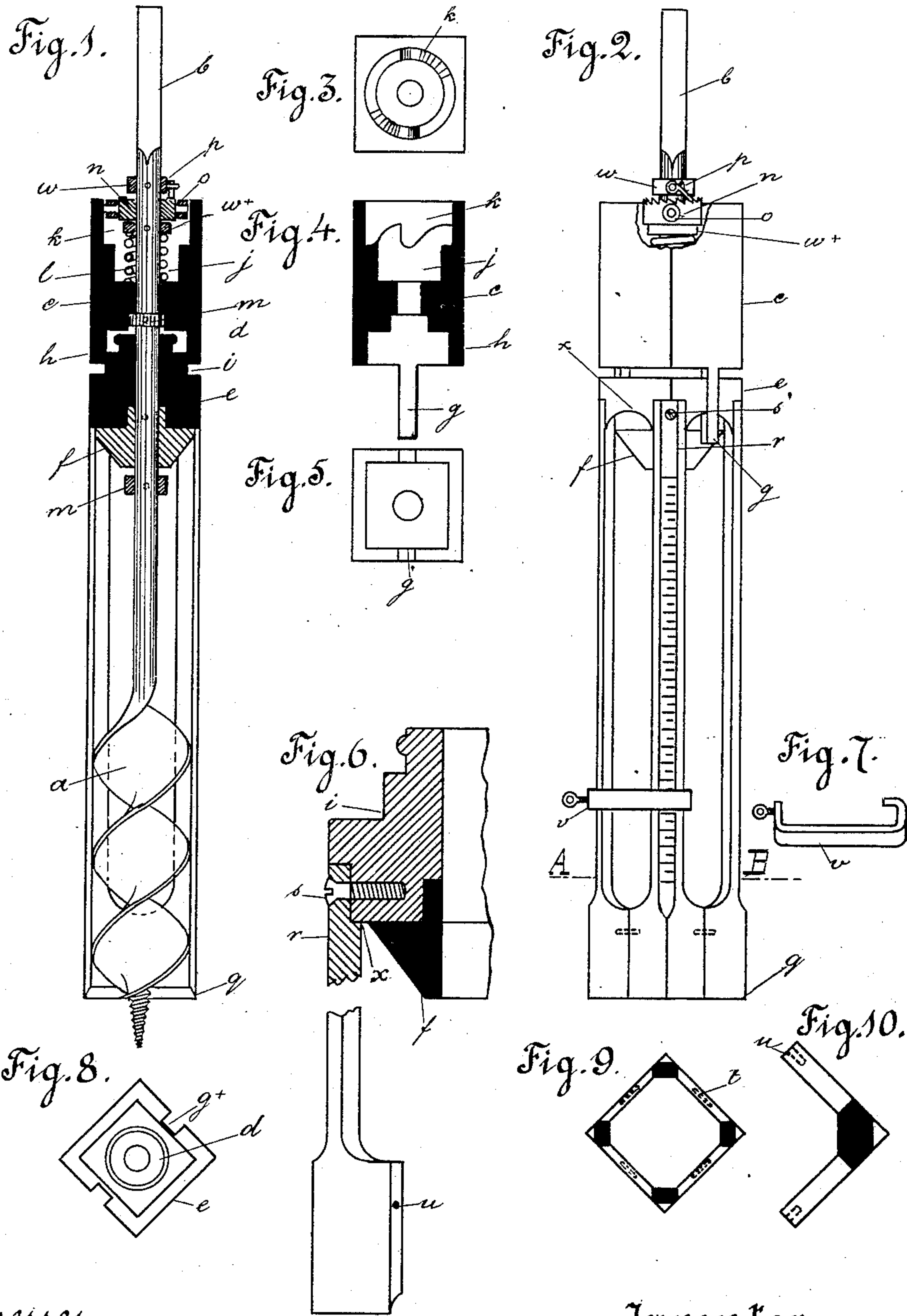
(No Model.)

W. PATTERSON.

AUGER FOR CUTTING SQUARE HOLES.

No. 333,662.

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Witnesses.

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AUGER FOR CUTTING SQUARE HOLES.

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Application filed April 20, 1885. Serial No. 162,842. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PATTERSON, a resident of San Francisco, State of California, have invented certain new and useful Improvements in Augers for Cutting Square Holes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

My invention relates to the class of wood-cutting tools, known as "mortising" augers or tools for cutting square holes; and my improvements consist of certain novelties in the construction of the cutting-tools and the mechanism for operating them, and of the combination therewith of a twisted auger or boring-tool, from the rotation of which in the operation of boring the cutting-tools are driven into the wood.

The parts and features constituting my said invention are combined to produce an improved tool of the character described.

The following description fully explains the nature of my said invention and the manner in which I proceed to construct, apply, and operate the same, the accompanying drawings being referred to by figures and letters.

Figure 1 represents a longitudinal section of the auger, showing the internal mechanism. Fig. 2 represents elevation of the auger. Fig. 3 is a plan view of the hammer. Fig. 4 represents a section of the hammer. Fig. 5 is an inverted plan view of the hammer. Fig. 6 is an enlarged view of part of the anvil, showing attachment of the chisels. Fig. 7 represents elevation of the adjusting-clamp. Fig. 8 is a plan view of the anvil. Fig. 9 represents a section of the auger through the line A B. Fig. 10 is an enlarged view of the chisel.

In Fig. 1, *a* is the auger; *b*, auger-shank; *c*, hammer; *d*, anvil; *e*, four-sided part of anvil; *f*, conical end of anvil; *h*, flanges on lower end of hammer; *i*, shoulder on anvil for flange of hammer; *j*, spiral spring chamber in hammer; *k*, cams in spring chamber; *l*, spiral spring; *m*, regulating fixed collars; *n*, rotating ratchet-collar; *o*, cam-pin with friction-roller attached to rotating ratchet-collar; *p*, pawl and spring on upper fixed collar; *q*, chisels; *w*, upper fixed collar, and *w*^x, lower fixed collar.

In Fig. 2, *b* is the auger-shank; *c*, hammer; *e*, four-sided part of anvil; *f*, conical end of anvil; *g*, longitudinal guides attached to hammer; *n*, rotating ratchet-collar; *o*, cam-pin with friction-roller attached to rotating ratchet-collar; *p*, pawl and spring on upper fixed collar; *q*, chisel; *r*, chisels attached to shank; *s*, screw connecting chisels to anvil; *v*, adjusting-clamp with set-screw; *w*, upper fixed collar; *w*^x, lower fixed collar; and *x* chamfered lower edge of anvil between chisel-shanks, Fig. 3; *k*, cam in spiral-spring chamber.

In Figs. 4, 5, *c* is the hammer; *g*, longitudinal guides attached to hammer; *h*, flanges on lower end of hammer; *j*, spiral-spring chamber in hammer, and *k* cam in spring chamber.

In Fig. 6, *f* is the conical end of anvil; *i*, shoulder on anvil for flange of hammer; *r*, chisels attached to shank; *r*^x, shoulder on inner side of chisel-shank, and *s* screw connecting chisel-shank to anvil.

In Figs. 7, 8, *v* is the adjusting-clamp with set-screw; *d*, anvil; *e*, four-sided part of anvil; and *g*^x slots for longitudinal guides *g*.

In Figs. 9, 10, *t* represents connecting-pins in edge of chisel-bits, and *u* hole for pin in edge of chisel-bit.

The auger *a* is of the ordinary twisted form, having two or more twists, the feed or point being coarser than usual. The lips differ from the ordinary construction in that the edge of the pod or twist at the point of intersection with the lip is ground on its upper surface, giving a rectangular cutting-lip. The shank *b* of the auger may be of any suitable length. The hammer *c* is made of steel or iron or other suitable metal, and its external form may be either square or cylindrical in its internal construction. It is drilled out on its upper end to a depth suitable to form chamber *j* for the reception of the spiral spring *l*, which surrounds the auger-shank and operates between the bottom of the chamber and the lower fixed collar, *w*^x, on the auger-shank.

In the upper part of chamber *j* are formed with the hammer or attached thereto cams *k*, for operating pin *o*, attached to rotating ratchet-collar *n* on the auger-shank between fixed collars *w* *w*^x, the collars being held on by the shank by screws. The lower end of the hammer is also drilled out to a suitable depth to

receive the anvil *d*, and in the center of the cavity there is a further drilling for the admission of regulating-collar *m*, which is held to the auger-shank by a screw. The solid metal between the chamber *j* and the cavity in the lower end of the hammer constitutes the hammer proper, and extends below the collar *m*, and may be of any required thickness. In drilling the lower cavity in the hammer, a flange, *h*, is formed which passes over a square shoulder, *i*. The anvil *d*, the face of which is formed of tempered steel, projects above the four-sided part into the square cavity formed by flanges *h*. The middle part of the anvil has four plane sides, *e*, the corners of which for the required length are cut in dovetail for the reception of the ends of the chisel-shanks *r*, which, when in position, butt against the solid metal above the dovetail, Figs. 2, 6. The chisel-shanks have a shoulder, *r*^x, on their inner sides fitting directly under the square part of the anvil, and are held by a screw, *s*, Fig. 6. The lower edges of the anvil between the chisel-shank are chamfered, *x*, and conform in their angle to the conical end *f*. The conical end may form part of the anvil or be constructed separately and attached thereto. Both hammer and anvil are bored centrally for the reception and action of the auger-shank. On the lower end of the hammer are two or more projecting guides, *g*, which pass into slots *g*^x in the sides of the anvil and hold both hammer and anvil in position and prevent their rotating with the auger. The bits of the chisels *q* may be right angled or other desired form, and the edges straight, convex, or concave, and are ground on their inner side. They may be connected by a pin, *t*, or other suitable way, the head of the pin being attached to the edge of one bit and the point entering the hole *u* in the edges of the other bit. One or more chisel-shanks may be graduated to desired mortise and adjusted by the clamp and set-screw *v*. The clamp is placed on the outside of the shank, and in the flange is the set-screw, and in the other end a hook form to catch on inner side of shank. The rotating ratchet-collar *n* works between the fixed collars *w w*^x. The ratchets are on its upper face, in which the pawl *p* operates, and is held in the ratchets by a small spring, Figs. 1, 2.

The operation of the tool is as follows: By the rotation of the auger the pin *o* on the ratchet-collar *n* travels on the edge of a cam, *k*, to its extreme lower end, causing the hammer *c* to rise and the spiral spring *l* to contract. From the lower extremity of the cam the pin moves upward to the starting-point of the next cam, which causes the spring to expand and the hammer to drop and deliver successive blows upon the face of the anvil, which drive the chisels *q* slightly in advance of the auger-feed and produces a square cut in the wood, the chips from which is lifted out by the rotation of the auger and the form of its lip. The collar *m* regulates the feed of the chisels, according to the quality of the wood

operated upon. The rotating collar *n*, combined with the action of the pawl and spring *p*, checks the feed of the auger by a reverse motion and permits it to be withdrawn. The conical end *f* of the anvil, combined with the chamfered edges *x*, permits the free passage of chips from the mortise between the chisel-shanks. The longitudinal hammer-guides *g*, acting in slots *g*^x in the anvil, bind hammer and anvil and prevent their rotation with the auger, and also prevent the disconnection of hammer and anvil when the hammer is raised to deliver blows.

As I have shown, the straight cuts and the angles or corners are made in the wood in advance of the action of the lips and cutting-edges of the boring-tool, the effect of which is to produce a clean hole with sharp corners. This cannot be accomplished with certainty if the boring-tool works in advance of the chisels.

The improved tool thus produced is adapted for use in a frame or holder similar to that used for a common mortising-auger, and it may be used also in a machine worked by hand or power.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of an auger, *a*, having two or more twists, and the feed or point coarse, and a rectangular cutting-lip, chisels *q*, surrounding said auger, and formed in right angle or straight, with their edges straight, convex, or concave, a hammer, *c*, having a vertical movement on the shank *b* of the auger to deliver a succession of blows upon an anvil, and the anvil *d*, to which the shanks of the chisels *q* are attached, the said movement of the hammer being produced in one direction by the rotation of the auger, and in the other direction by the spiral spring *l*, substantially as hereinbefore described.

2. In a mortising-tool for cutting square holes, the combination of the auger or boring device, the cutting device formed of a chisel or chisels, a hammer having a vertical movement, and an anvil to which the chisels are attached, the said hammer being adapted to deliver a succession of blows upon the said anvil during the rotation of the auger, and the whole adapted to move on the auger-shank, substantially as specified.

3. The combination of an auger, *a*, chisels *q*, surrounding the auger-blades, the hammer *c*, and anvil *d*, surrounding the auger-shank, the guides *g*, extending from the hammer, slots *g*^x for the passage of the guides, the spiral spring *l*, engaging the hammer, cam *k*, regulating-collar *m* of the auger-stem, ratchet-collar *n*, arranged on the auger-stem, the cam-pin, pawl and ratchets, and fixed collars *w w*^x on the auger-stem, substantially as specified.

4. The combination of the separable, angular, or straight chisels *q*, having pins, and holes *u*, to receive the pins to preserve true linear position of the chisels, and the clamp carrying

a set-screw to embrace and lock the chisel-sections together and serve with an auger, substantially as specified.

5 The combination of a rotating auger, *a*, surrounding chisels *g*, the hammer *e*, and anvil, *d*, arranged, respectively, on the shank of the auger, and the said hammer being operated by the rotary movement of the auger so as to deliver successive blows upon the said

anvil to which the shanks of said chisels are attached, substantially as specified.

In testimony whereof I have hereunto set my hand and seal.

WILLIAM PATTERSON. [L. S.]

Witnesses:

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