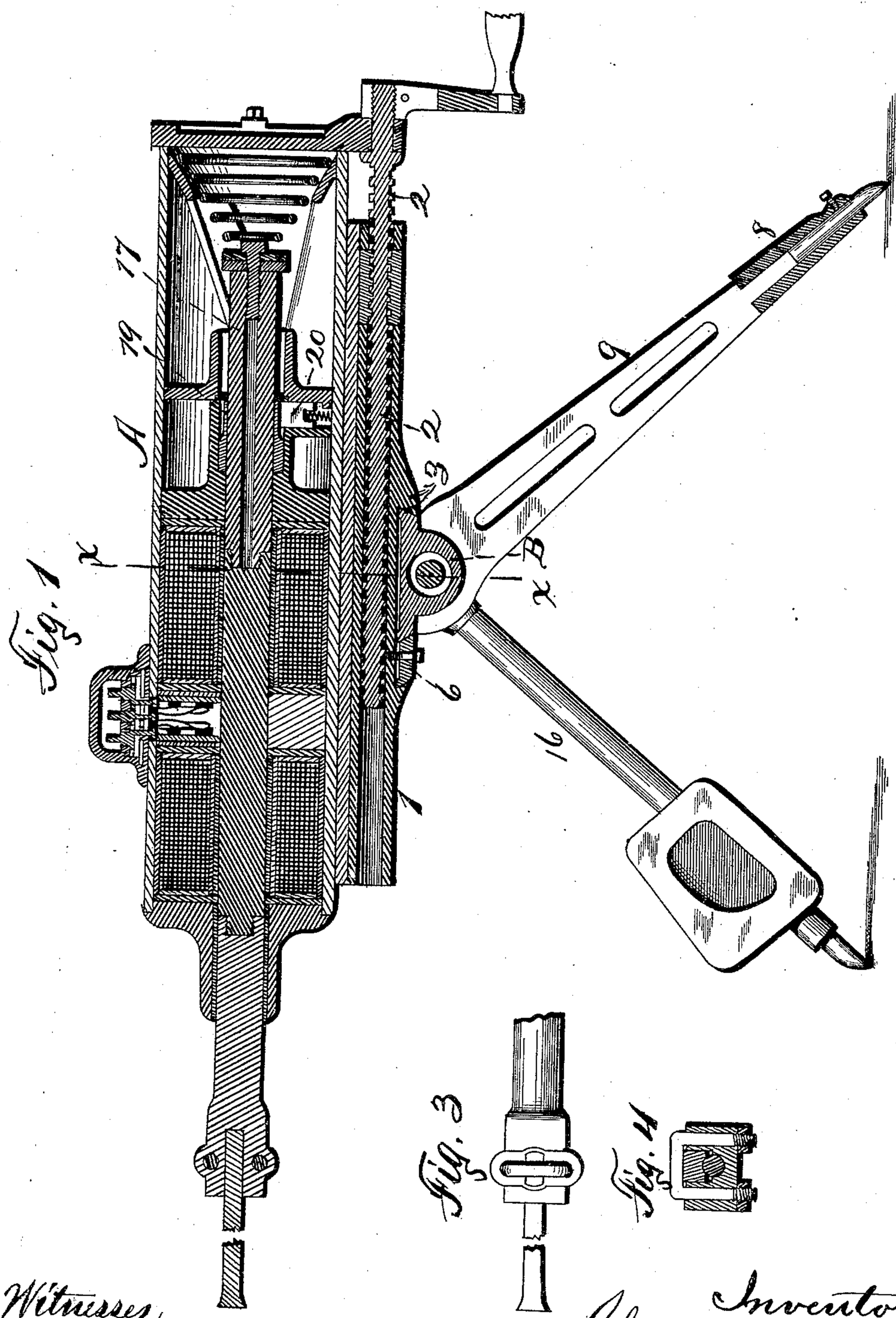
(No Model.)

2 Sheets—Sheet 1.

C. E. LIPE.

RECIPROCATING TOOL.

No. 460,089. Patented Sept. 22, 1891.



Witnesses
E. V. Mark
G. W. Skinner

Inventor
Charles E. Lipe
By Smith & Denison
his Attorneys

(No Model.)

2 Sheets—Sheet 2.

C. E. LIPE.

RECIPROCATING TOOL.

No. 460,089. Patented Sept. 22, 1891.

Fig. 2.

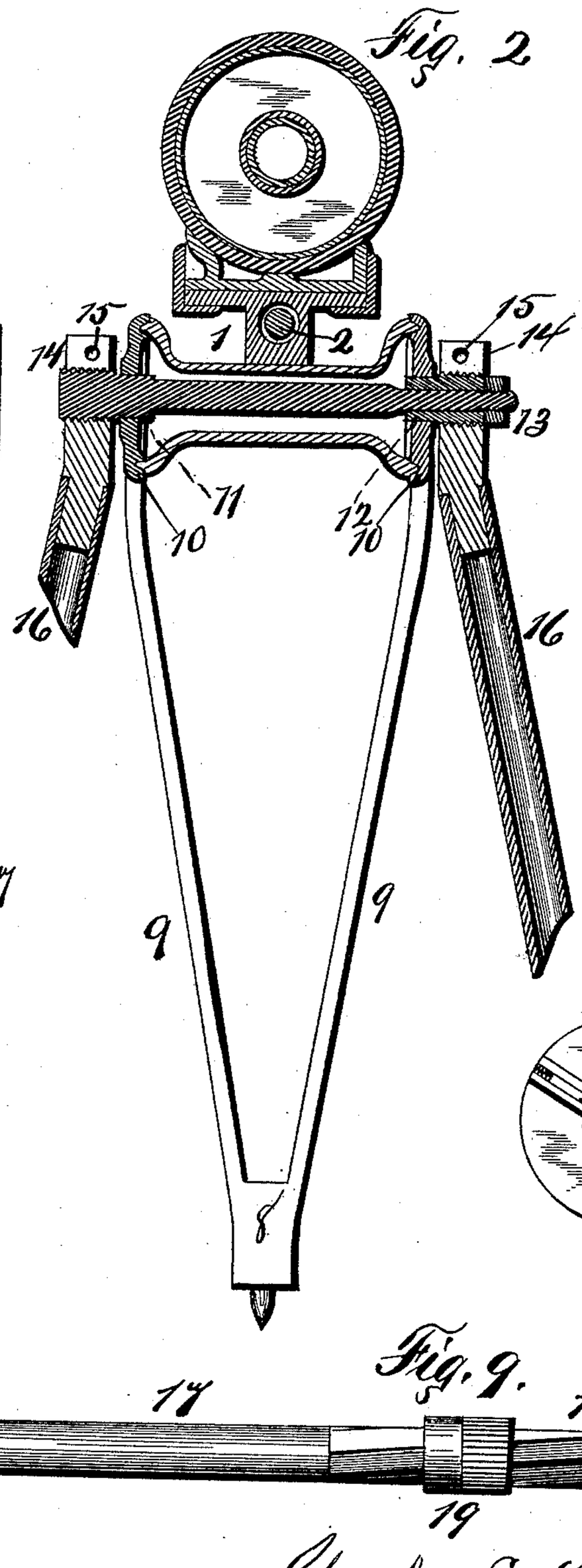


Fig. 5.

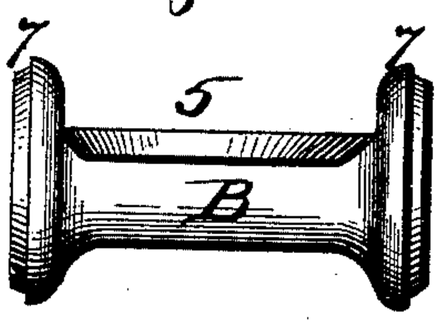


Fig. 6.

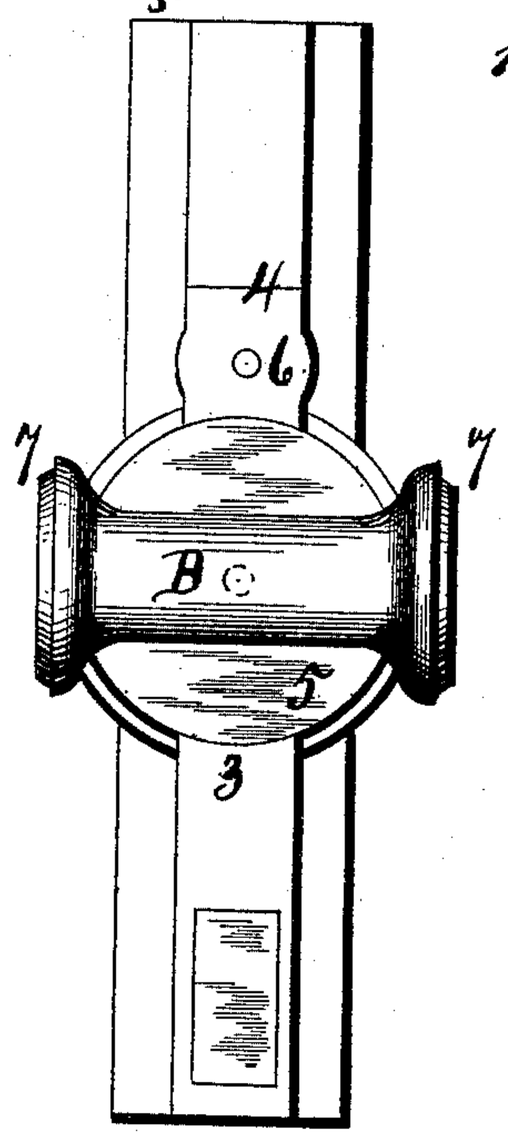


Fig. 7.

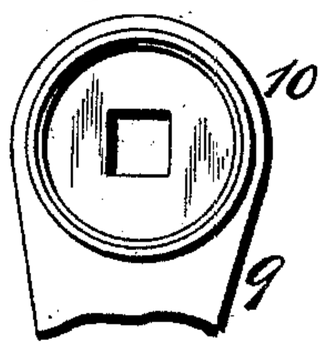


Fig. 8.

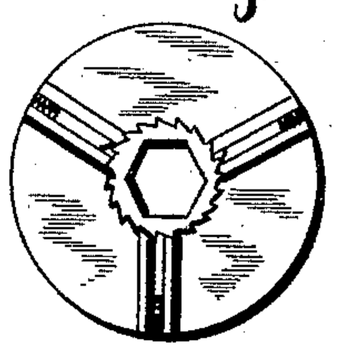


Fig. 9.

WITNESSES:

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BY

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HIS ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES E. LIPE, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MARVIN ELECTRIC DRILL COMPANY, OF SAME PLACE.

RECIPROCATING TOOL.

SPECIFICATION forming part of Letters Patent No. 460,089, dated September 22, 1891.

Application filed October 8, 1890. Serial No. 367,434. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. LIPE, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Reciprocating Tools, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to reciprocating tools in which the motor causes the tool-carrier to traverse its casing, and in which means are provided for adjusting the tool by mounting the casing upon a universal joint, and in which means are provided for automatically turning the tool upon its longitudinal axis.

My object is to improve the construction and operation and increase its utility by enabling the operator to direct the tool to different points, horizontally or vertically, in any direction within the range of the universal joint, the tool when in operation being automatically turned or twisted by the automatic rotation or partial rotation of its carrier, such rotation being effected through the traverse of the carrier, which is actuated by solenoids.

My invention consists in the several novel features of construction and operation hereinafter described, and which are specifically set forth in the claim annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a rock-drill in which the tool and its carrier are reciprocally actuated by a solenoid. Fig. 2 is a vertical transverse section of the same on line X X, Fig. 1. Fig. 3 is a top plan of the front end of the tool-carrier. Fig. 4 is a vertical transverse section of same alongside of the staple, giving details of the tool grip or chuck. Fig. 5 is a side elevation of the spool device, part of the universal joint. Fig. 6 is a bottom plan of the spool and the connections making the joint for horizontal adjustment of the implement and swing of the tool. Fig. 7 is a plan view of the inner face of one of the disks which engages with one end of the spool. Fig. 8 is a front elevation of the ratchet-and-pawl mechanism detached. Fig. 9 is a side elevation of the rear portion of the tool-carrier, showing the ratchet in position on the spiral portion thereof.

A is the casing of the drill, and 1 is the case receiving the feed-screw 2, secured to or integral with the casing. A slotway is cut across the lower face of this case dovetailing and having its rear side curved, as at 3 in Fig. 6, while the front side of the slot is straight, as at 4, or it may be curved, if desired.

B is a tubular spool-shaped piece of metal provided on its upper side with a circular bevel-edged table 5, adapted to fit the curved side 3 of the slotway, and 6 is a filling-piece, beveled on both edges, which secures this table in the slotway; and this table and slotway beneath the casing constitute that part of the universal joint which permits the casing and drill to be swung sidewise. The ends of the spool are enlarged and beveled and provided with a stop-shoulder, as at 7. The leg 8 is provided with arms 9, which are provided with disks 10 on their upper ends, which disks are grooved in their inner faces to receive the beveled ends of the spool, the shoulder bearing against said faces, and the spool and these disks constitute the other part of the universal joint, which permits the vertical swing of the casing thereon to elevate or lower the front end thereof. The disks 10 are each provided with a rectangular or polygonal central opening, in which on the left the squared or polygonal portion of the pintle 11 fits closely. The other disk receives the squared or polygonal end of the internally-cylindrical sleeve 12, through which the reduced and rounded end of the pintle passes, and 13 is a nut screwed thereon to hold the parts together. The left-hand end of the pintle is rounded and threaded, and 14 is a split nut screwed thereon and provided with holes 15 to receive a tightening-bolt, and 16 is a leg secured to said nut.

The outer end of the sleeve 12 is rounded and threaded and a split nut, like 14, is screwed thereon and carries the other leg 16 on that side. Thus either leg can be shifted to set the implement without affecting the universal joint, and

the joint can be operated either horizontally or vertically without affecting the set of the legs; and, further, the nut 13 can be screwed up tight enough to spring the arms of the leg and disks inward far enough to make all tight and hold the casing at any point of its vertical adjustment, whether at or above or below a horizontal.

The automatic mechanism for turning the drill and drill-carrier comprises the carrier 17, consisting of a cylindrical shaft of metal, the rear portion of which is cut to form a polygonal or other spiral 18, as shown in Fig. 9, and a ratchet-nut 19, adapted to properly fit upon or engage with the spiral and spring-pawls 20, engaging with the ratchet. Then when the drill and carrier are thrown forward the spiral rotates the ratchet, and then when the carrier is drawn back the pawl holds the ratchet, and through its partial rotation the drill is held in a new position for the next stroke, the turning of the drill being usually about one-tenth.

The chuck for holding the drill or tool in the front end of the carrier comprises a recess in the carrier to receive the shank of the drill, a vertical slot in the carrier opening into the recess, a grip-block fitting loosely in the slot and bearing upon the shank of the drill, and a staple-bolt, the cross-bar of which engages with the block transversely. Then when the nuts on the arms of the staple are screwed up the blocks grip the shank of the tool.

The frusto-conical coil-spring at the rear of the tool-carrier operates to store up energy and absorb power with the upward stroke of the carrier, which bears against it and compresses it, and upon the reversal of the stroke gives better action and more resiliency of operation, and consequently a better and more effective blow than single or double helically-coiled springs.

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

The combination, with the casing and legs, of the shaft threaded on one end to receive one leg, a sleeve fitting on the other end of said shaft and threaded externally to receive a second leg, a third leg provided with branching arms having disks upon their ends and having grooves in their inner faces, a spool fitting over said shaft and into the grooves in said disks, a bevel-edged table upon the spool, a seat for the table in the casing, and means for securing the table therein.

In witness whereof I have hereunto set my hand this 13th day of March, 1890.

CHARLES E. LIPE.

In presence of—
C. W. SMITH,
H. P. DENISON.