

No. 671,447.

Patented Apr. 9, 1901.

R. L. MORGAN & D. D. WILLIAMS.
TAP DRIVING HEAD.

(Application filed July 12, 1898.)

(No Model.)

2 Sheets—Sheet 1.

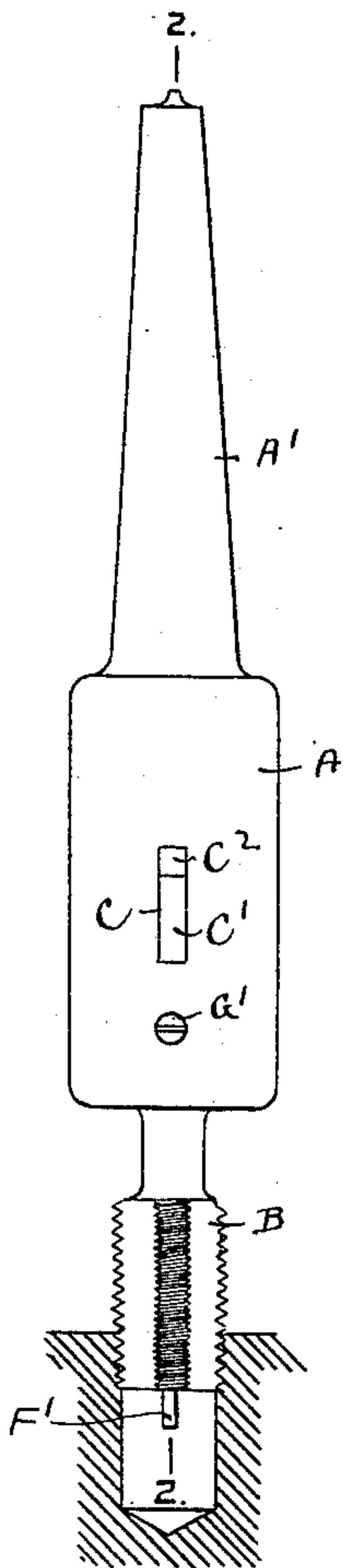


Fig. 1.

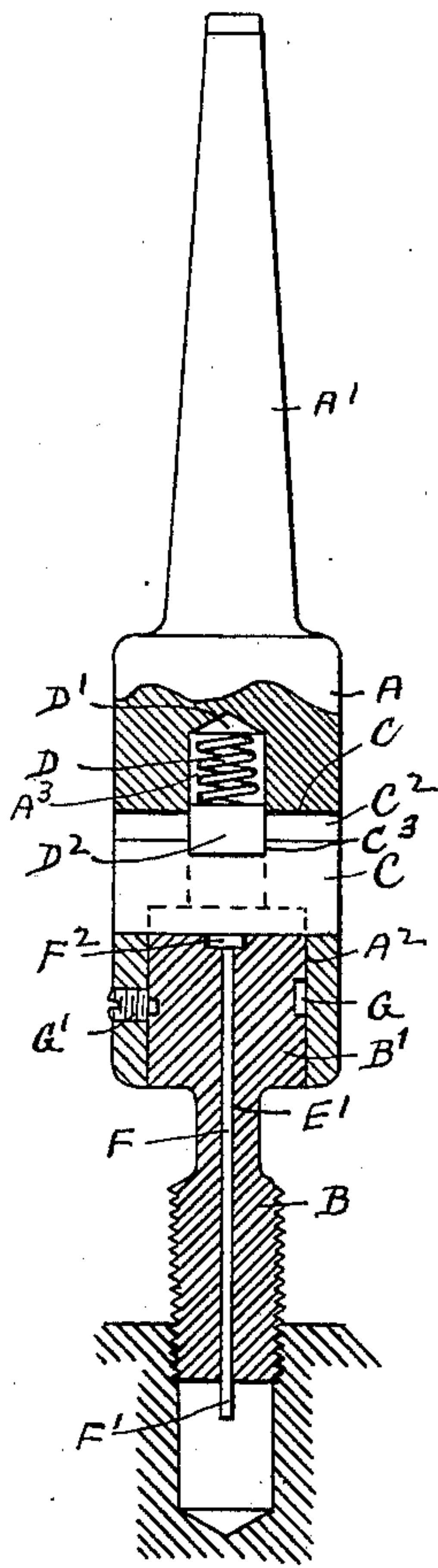


Fig. 2.

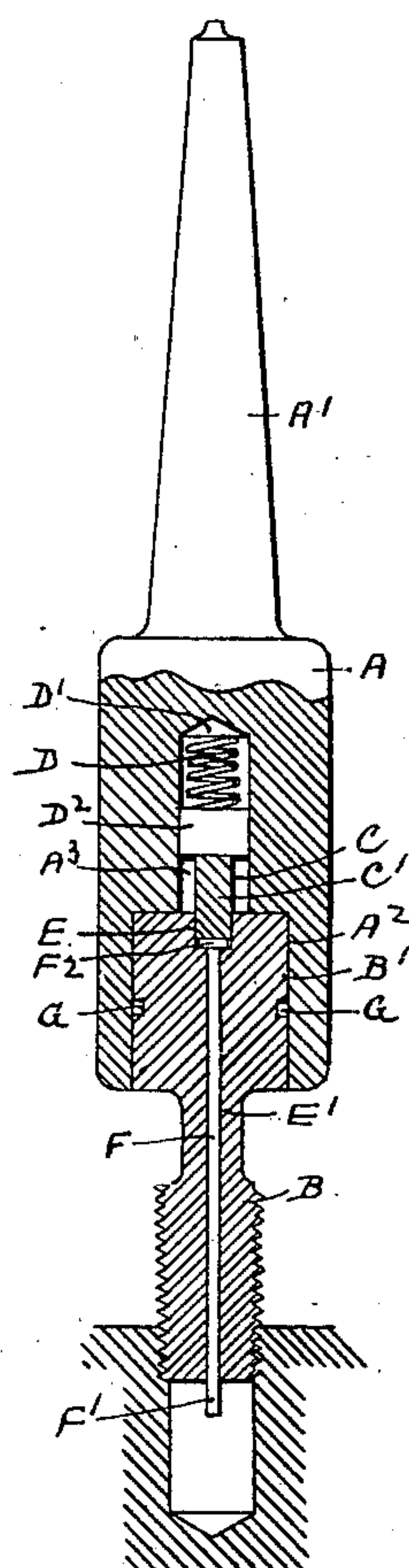


Fig. 3.

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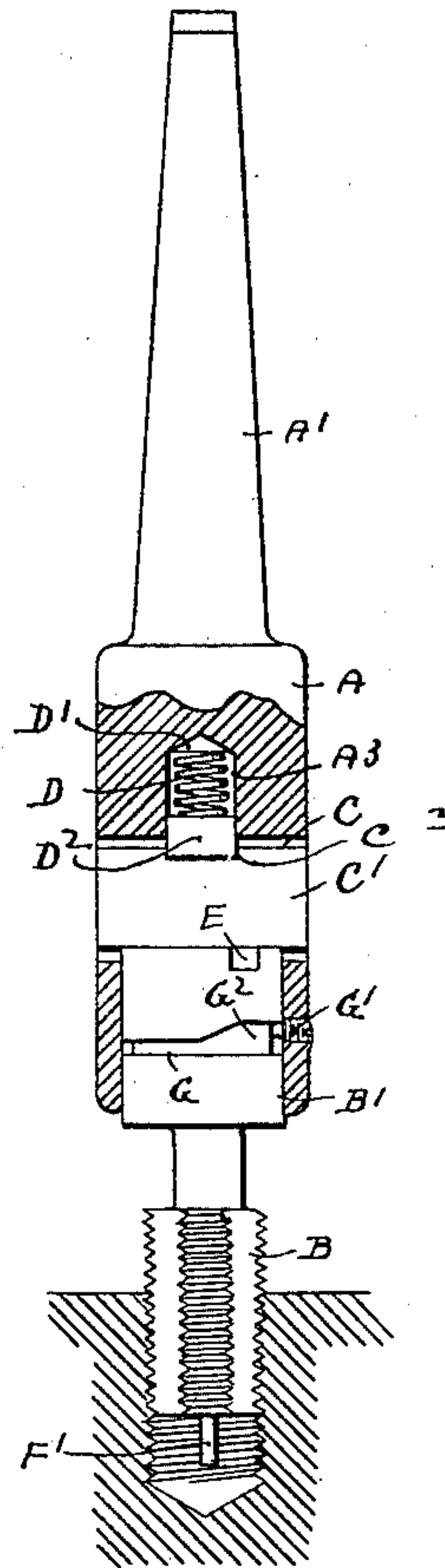
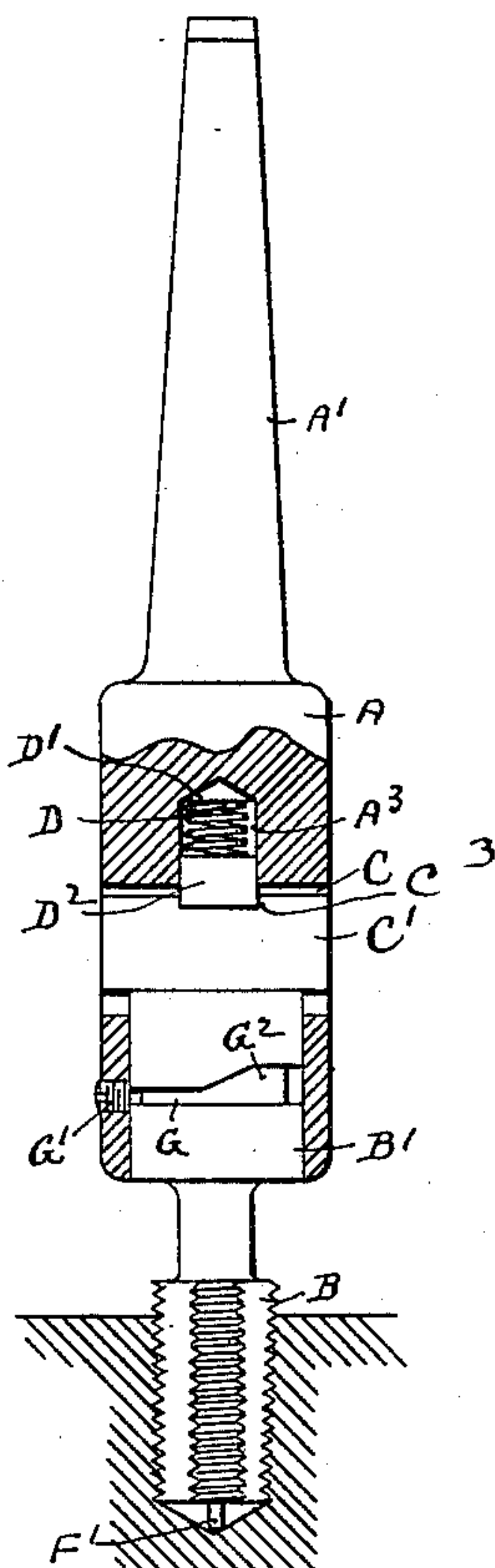
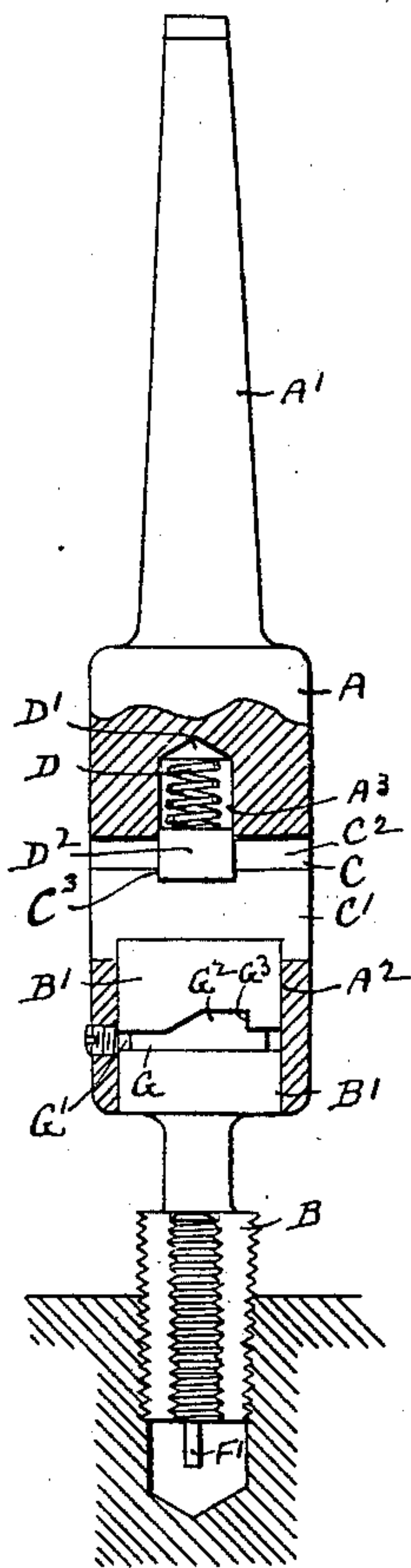
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2 Sheets—Sheet 2.



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RALPH L. MORGAN AND DAVID D. WILLIAMS, OF WORCESTER, MASSACHUSETTS; SAID WILLIAMS ASSIGNOR TO SAID MORGAN.

TAP-DRIVING HEAD.

SPECIFICATION forming part of Letters Patent No. 671,447, dated April 9, 1901.

Application filed July 12, 1898. Serial No. 685,749. (No model.)

To all whom it may concern:

Be it known that we, RALPH L. MORGAN and DAVID D. WILLIAMS, citizens of the United States, residing in Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Tap-Driving Heads, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a view of our improved tap-driving head with the tap held therein. Fig. 2 is a central vertical sectional view on line 2-2, Fig. 1. Fig. 3 is a vertical central sectional view on a plane at right angles to that shown in Fig. 2. Fig. 4 is a central sectional view of the head, showing the position of the tap-rotating mechanism during the operation of tapping. Fig. 5 is a central sectional view of the head, showing the position of the tap-rotating mechanism when the tap is released. Fig. 6 is a central sectional view of the head, showing the operation of the device when reversing and withdrawing the tap.

Similar letters refer to similar parts in the different figures.

Our present invention relates to a tap-head for holding a screw-tap, comprising mechanism by which the rotation of the head is communicated to the tap in the operation of cutting a screw-thread, mechanism for automatically disengaging the tap from the rotating head as the end of the tap approaches the bottom of the hole to be tapped, and mechanism for reengaging the tap as the rotation of the head is reversed and the head is raised for the purpose of withdrawing the tap; and it consists in the construction and arrangement of parts, as hereinafter described, and set forth in the annexed claims.

Referring to the drawings, A denotes the tap-head, provided with a tapering shank A', adapted to be inserted in and rotated by the hollow revolving spindle of a lathe or drill-press, by which the tap-head can be rotated and advanced or withdrawn by means of the usual and well-known feeding mechanism connected with the spindles of lathes and drill-presses. The end of the tap-head A is provided with a central circular chamber forming a socket A², adapted to receive the

cylindrical shank B' of a tap B. Extending upward from the socket A² is a central circular chamber A³. The tap-head A is provided with a diametrical mortise C, with its upper portion passing through the chamber A³ and with its lower portion passing through the socket A². The mortise C contains a flat steel key or driving-bar C', which is somewhat narrower than the mortise C, leaving a space C², which allows a slight sliding motion of the driving-bar C' in the tap-head A. The central chamber A³ contains a spiral compression-spring D, which presses against the end wall D' of the chamber A³ and a disk D², held in a notch C³ in the upper edge of the driving-bar C', so that the pressure of the spiral spring D will push the driving-bar C' against the lower end wall of the mortise C.

The shank B' of the tap is provided with a groove E in its upper end to receive the edge of the driving-bar C' when the shank is inserted in the cylindrical socket of the tap-head, causing the rotation of the tap-head A to be communicated to the tap B.

The tap is provided with a concentric hole E' to receive a sliding spindle F, which projects beyond the end of the tap at F'.

The upper end of the shank B' is counter-bored in the bottom of the groove E to receive the head F² of the sliding spindle F. The shank B' is provided about midway its length with a circumferential groove G, which receives the point of a screw G', held in the tap-head, and holds the tap from falling out when used in an upright drill-press. Upon the upper side of the groove G is a notch G², having a vertical abutting wall G³, so that when the tap is held in the tapped hole the point of the screw G' will be drawn into the notch G² by raising or withdrawing the tap-head, causing the point of the screw to strike against the wall G³ when the tap-head is reversed, and thereby reversing the tap for the purpose of withdrawing it from the tapped hole.

The operation of our improved tap-head in the operation of tapping, releasing the tap, and withdrawing it from the tapped hole is as follows: The rotation of the tap-head A is imparted to the tap by means of the driving-bar C', which is held in the mortise C and is pressed into the groove E in the end of the

tapped shank B' by the spiral compression-spring D, forming a clutch between the tap-head and the cylindrical shank B' of the tap. When the tapping is completed, the projecting end F' of the sliding spindle F is brought in contact with the bottom of the hole, which pushes the spindle F into the tap and lifts the driving-bar C' against the pressure of the spring D, thereby removing it from the groove E in the shank B' and releasing the tap. The rotation of the tap-head is then reversed and raised slightly, bringing the end of the screw G' into the notch G² and against the wall G³, causing the tap to be rotated backward and withdrawn from the work.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination with a tap-head provided with a socket adapted to receive a tap, a tap provided with a diametrical groove in the end of its shank, said tap-head having a mortise entering said socket and overlapping the grooved end of a tap-shank inserted therein, of a driving-bar held in said mortise and arranged to engage the grooved shank of the tap and capable of sliding in said mortise lengthwise the tap-head, a spring bearing against said driving-bar to hold it in engagement with the groove of the tap and means for moving said driving-bar against the pressure of said spring and releasing the tap, substantially as described.

2. The combination with a tap-head provided with a central socket for a tap, a central chamber in alinement with said socket and a mortise passing diametrically through said tap-head, of a driving-bar held in said mortise and capable of sliding lengthwise said tap-head, a tap held in said tap-head having a groove adapted to receive said driving-bar and a central longitudinal hole for a sliding spindle, a sliding spindle held in said tap and projecting from its end, said spindle bearing against said driving-bar and a spring applied to said driving-bar to hold it in engagement with the tap, substantially as described.

3. The combination of a tap-head provided

with a circular socket for a tap, a tap having a cylindrical shank held in said socket and provided with a circumferential groove, a pin or screw held in said tap-head with its end entering said groove whereby the tap is held from withdrawal by one of the side walls of said groove, said groove having a notch in its opposite side wall adapted to receive the end of said pin as the tap-head is raised, whereby the tap is reversed by the engagement of said pin and said notch, substantially as described.

4. The combination with a tap-head provided with a central socket A² and a central chamber A³ and a diametrical mortise C, of a tap having a cylindrical shank B', provided with a transverse groove E in its end, a driving-bar C' held in said mortise and having a notch C², a disk D² held in said notch and a compression-spring D held in the chamber A³ with its tension applied to said disk to hold the driving-bar C' in the groove E of the tap, substantially as described.

5. The combination with the tap-head and tap held therein and provided with a grooved shank of the driving-bar held in said tap-head and engaging the grooved shank of said tap, a spring with its tension applied to hold said driving-bar in engagement with said tap and means for automatically pushing said driving-bar out of engagement with said tap when the operation of tapping has been completed, substantially as described.

6. The combination with a rotating tap-head provided with a socket to receive a tap-shank, a driving-bar held by said tap-head and projecting into the tap-socket, a tap having a shank fitting said socket and engaged by said driving-bar and means for automatically disengaging said driving-bar from the tap-shank, substantially as described.

Dated this 6th day of July, 1898.

RALPH L. MORGAN.
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Witnesses:

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