

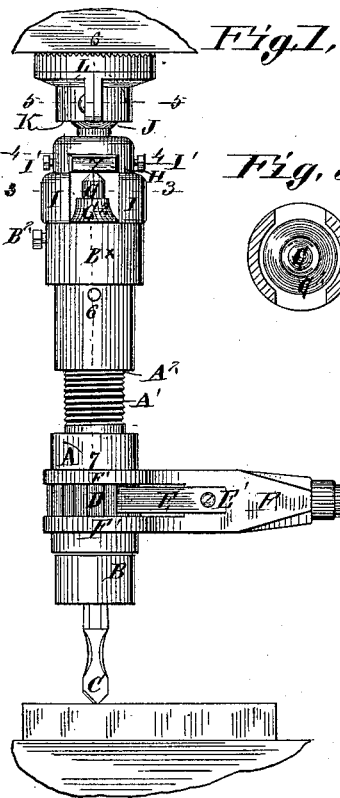
(No Model.)

J. M. SHERMAN.

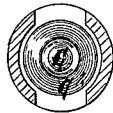
RATCHET DRILL.

No. 345,547.

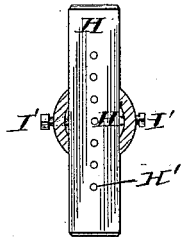
Patented July 13, 1886.



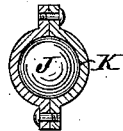
*Fig. 3,*



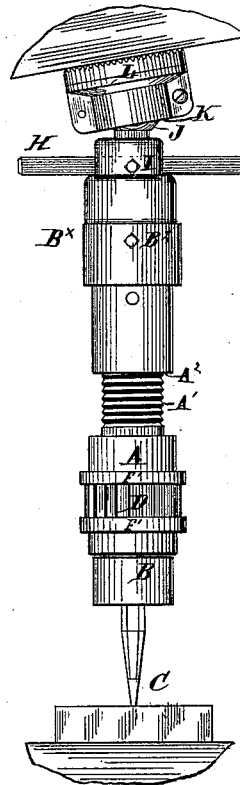
*Fig. 4,*



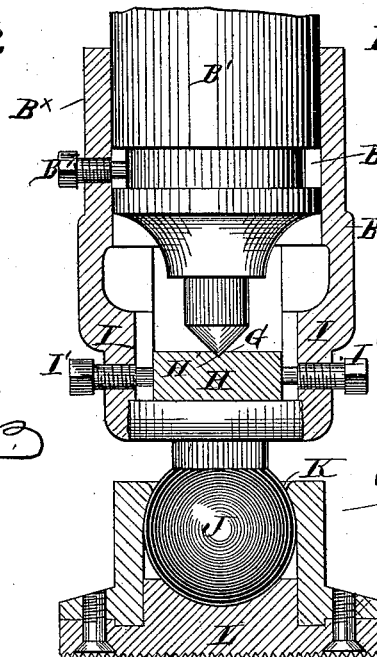
*Fig. 5,*



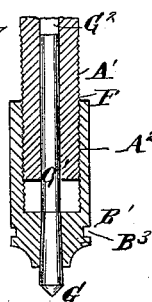
*Fig. 2,*



*Fig. 6,*



*Fig. 7,*



*Attest:*  
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By Knight & Bro.  
attys

# UNITED STATES PATENT OFFICE.

JAMES M. SHERMAN, OF ST. LOUIS, MISSOURI.

## RATCHET-DRILL.

SPECIFICATION forming part of Letters Patent No. 345,547, dated July 13, 1886.

Application filed December 30, 1885. Serial No. 187,151. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. SHERMAN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Ratchet-Drills with Self-Adjusting Heads, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figures 1 and 2 are side views showing the adjustable head placed with its axis respectively coincident and obliquely to the axis of the bore. Fig. 3 is a transverse section at 3 3, Fig. 1. Fig. 4 is a transverse section at 4 4, Fig. 1. Fig. 5 is a transverse section at 5 5, Fig. 1. Fig. 6 is an enlarged detail section at 6 6, Fig. 1, with the head inverted; and Fig. 7 is a detail section on line 7 7, Fig. 1, with the center point inverted.

My invention relates to a ratchet-drill with a stationary center bearing and adjustable head-rest; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, in which similar letters designate like parts in the several figures, A represents one of my ratchet-drills; B and B<sup>x</sup>, respectively, the lower and upper stocks of the drill; C, the drill-bit, and D the ratchet-wheel, with which a pawl, E, engages, its fixed end E' being attached to the operating-lever F, which is secured in working position to the ratchet, in the usual manner, by bands F' or otherwise.

A' represents the feed-screw, which is so connected to the lower stock, B, as to permit of the necessary relative rotation of the two. This screw engages at its upper end with corresponding screw-threads, A<sup>2</sup>, formed upon the interior of a socket-piece, B', said socket being in turn connected to the upper stock, B<sup>x</sup>, in such a manner as to permit of their relative rotation. In the present instance I have shown a circumferential groove, B<sup>3</sup>, cut in the socket B', with which engages the extremity of a screw, B<sup>2</sup>, tapped through the stock B<sup>x</sup>. This will be seen to permit of the free rotary, but to prevent longitudinal, movement of the parts relatively to each other.

G' represents a stem or spindle, the lower portion of which is cylindrical and fits a cor-

responding bore or socket, G<sup>2</sup>, formed axially in the upper end of the feed-screw A', and whose upper end is of enlarged conical shape and fits a corresponding perforation 55 formed axially through the upper end of the socket-piece B'. The upper extremity of the stem bears upon the upper stock, B<sup>x</sup>, through the intervention of a bearing-plate, H, said extremity being dressed to a point, G, so as to 60 reduce the bearing-surface to a minimum. The bearing-plate H may be of any desired length, and provided with any desired number of either perforations or indentations, H', for receiving, centering, and steadying the upper ex- 65 tremity of the stem G'. I do not desire to limit myself to the use of either the one or the other, as it is obvious that each will center the stem equally well. I will, however, for the sake of brevity, refer to them throughout this specifica- 70 tion as "indentations." The bearing-plate is passed through and bears against the upper side of an eye formed through the upper stock, B<sup>x</sup>, and is centered and held by set-screws I', tapped into the said stock and bear- 75 ing against it. From what has already been said it may be seen that the pressure is transmitted from the bit C to the lower stock, B, thence to the feed-screw A', thence to the socket B', thence to the stem G' G, thence to 80 the bearing-plate H, and thence to the upper stock, B<sup>x</sup>. The stem G' G being thus relied upon for transmitting the pressure, it is essential that it should be held absolutely against all lateral motion, and it is to this end that it 85 is given a conical bearing in the upper end of the socket B', (which, it will be understood, automatically takes up the wear between the friction-surfaces,) and its lower end extended far down into the bore formed in the feed-screw 90 A'. The slight longitudinal movement of the parts B' and B<sup>x</sup> for the purpose of taking up wear is provided for by forming the groove B<sup>3</sup> in the former somewhat wider than the extremity of the screw B<sup>2</sup> which enters it. This 95 last motion is also necessary in order to permit the withdrawal of the point G from its socket H' in the plate H when the latter is to be moved to bring a fresh socket, H', to operative position. 100

L represents the head-rest of the drill, whose bearing-surface is preferably flat (at right an-

gles to its axis) and serrated or toothed, in order that it may the more firmly engage the abutment by which the pressure is exerted.

J and K represent, respectively, the ball and the socket of the universal joint by which the head L is secured to the socket. I have shown the ball secured to the stock and the socket in the head L, but do not desire to limit myself to this particular arrangement, as the reverse would accomplish the desired end equally well.

By incorporating a universal joint in the stock-drill all lateral strains resulting from any irregularities or inequalities in the surface of the abutment which engages the head are avoided, as it will be seen that said head will automatically accommodate itself to such inequalities, always bearing on all sides with equal pressure. This dispenses with the need for wedges, &c., which are usually employed to fill any spaces that may be left between one side of the fixed head and the abutment which bears upon it when the surface of the latter is not exactly at right angles to the line of pressure.

Let it be observed that the advantages of my invention may be secured by other arrangements of the parts than that shown. For example, the feed-screw A', the hollow socket B', in which it works, the hollow stock B<sup>x</sup>, and the central bearing-stem, may be inverted with respect to the stock B and head-rest L, and the same operation would result.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a drill, the combination, with the hollow stock B<sup>x</sup> and the central bearing-stem extending upward thereinto, of the bearing-plate adjustable transversely to the axis of said stem, and having the indentations for the reception of the bearing-point of said stem, substantially as set forth.

2. In a drill, the combination, with the hollow stock B<sup>x</sup>, having the eye therethrough and the central bearing-stem extending upward thereinto, of the elongated plate adjustable in said eye, and having a number of indentations for receiving and centering the extremity of said stem, as set forth.

3. In a drill, the combination, with the hollow stock B<sup>x</sup>, the hollow socket B', and the feed-screw A', entering said socket, and hav-

ing the axial bore G<sup>2</sup>, of the central stem (upon the extremity of which said stock bears) extending through a central perforation in the socket B' and into the bore G<sup>2</sup> of the screw A', as and for the purposes set forth.

4. In a drill, the combination of the hollow stock B<sup>x</sup>, the internally-screw-threaded socket B', projecting thereinto and having the conical aperture formed axially through its upper end, the feed-screw A', entering said socket and having the axial bore G<sup>2</sup>, and the central bearing-stem entering said bore G<sup>2</sup> at its lower end, and having near its upper end the conical enlargement fitting the conical bore in the socket-piece B', substantially as and for the purposes set forth.

5. In a drill, the combination, with the hollow stock B<sup>x</sup> and a socket-piece entering said stock, and having a conical bearing-socket formed axially therein, of a central bearing-stem having a conical enlargement fitting said socket, and a bearing carried by said stock, with which the extremity of said stem engages, substantially as set forth.

6. In a drill, the combination, with the hollow stock B<sup>x</sup> and the socket-piece B', entering said stock, and having the elongated screw-threaded socket and the axial perforation, of the central stem, G', bearing upon said socket-piece B' and affording a bearing for said stock B<sup>x</sup>, as set forth, and the feed-screw A', entering said screw-threaded socket, and having a central perforation or bore for the reception of one extremity of said stem, for the purpose described.

7. In a drill, the combination, with the stock B<sup>x</sup>, the socket-piece B', and the central bearing-stem, of an adjustable bearing-plate having a number of indentations for receiving and centering said stem, as set forth.

8. The combination of the hollow stock B<sup>x</sup>, the internally-screw-threaded socket-piece B', having the circumferential groove B<sup>2</sup> and the conical perforation formed axially through its upper end, the set-screw B<sup>2</sup>, tapped into said stock and engaging said groove, and the stem G', having the conical enlargement fitting said conical socket, as and for the purposes set forth.

JAMES M. SHERMAN.

In presence of—

SAML. KNIGHT,  
JOE. WAILE.