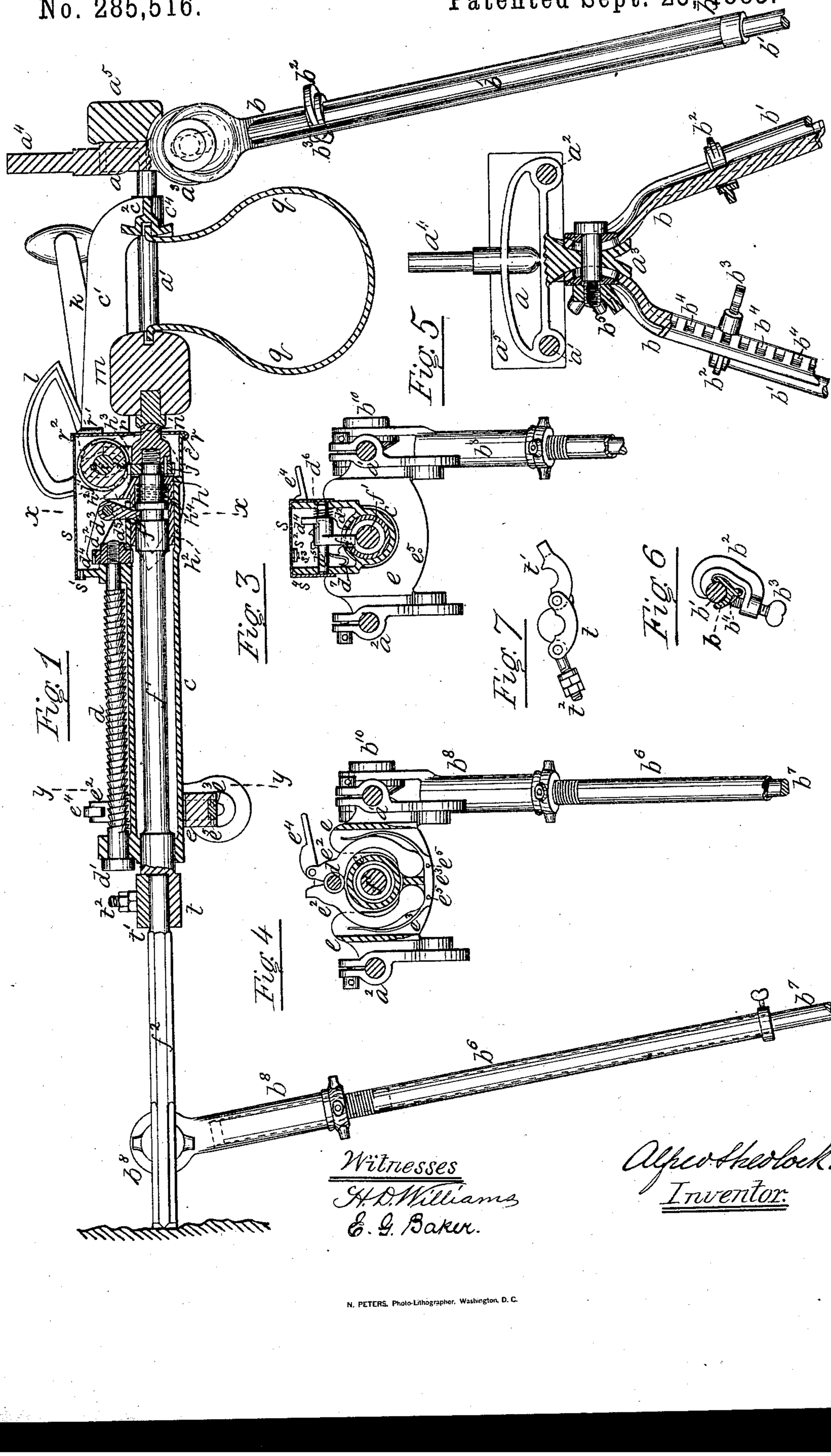
(No Model.)

2 Sheets—Sheet 1.

A. SHEDLOCK.

ROCK DRILL.

No. 285,516. Patented Sept. 25, 1883.



Witnesses
H. D. Williams
E. G. Baker.

Alfred Shedlock.
Inventor.

(No Model.)

2 Sheets—Sheet 2.

A. SHEDLOCK.

ROCK DRILL.

No. 285,516. Patented Sept. 25, 1883.

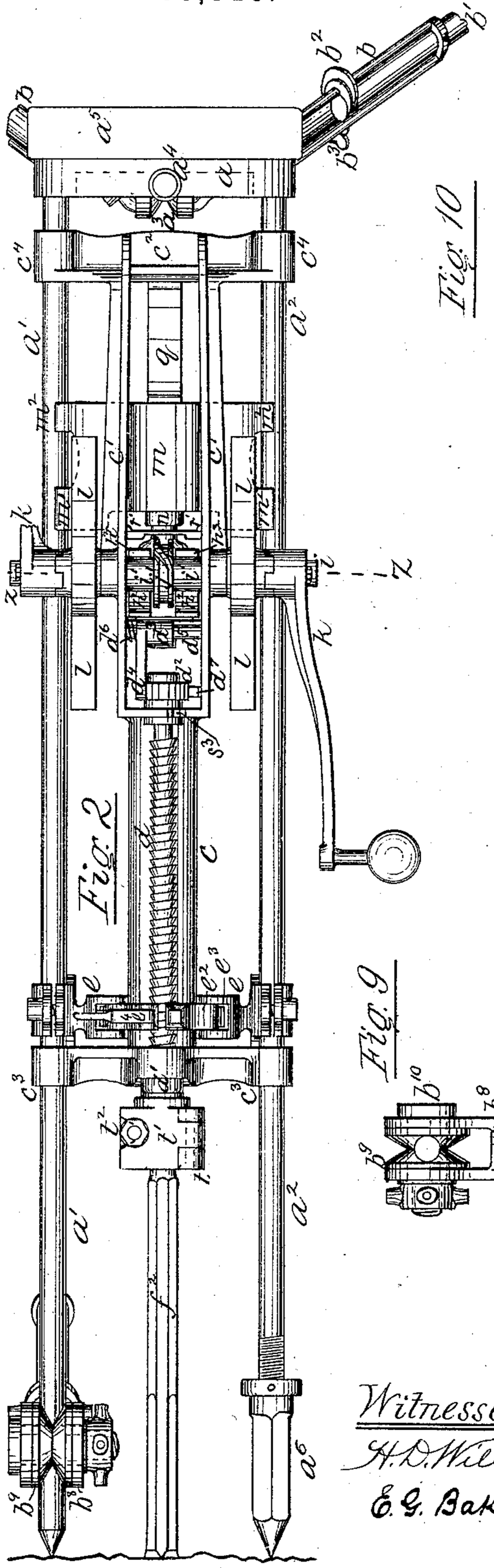


Fig. 2

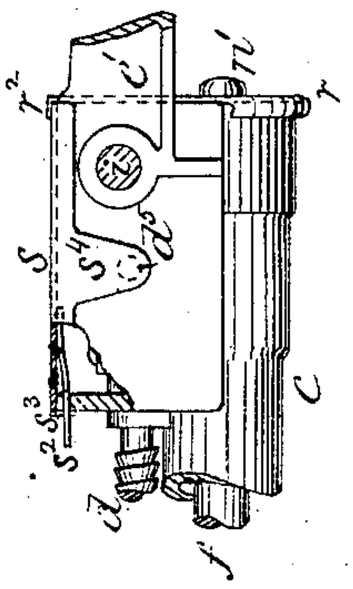


Fig. 10

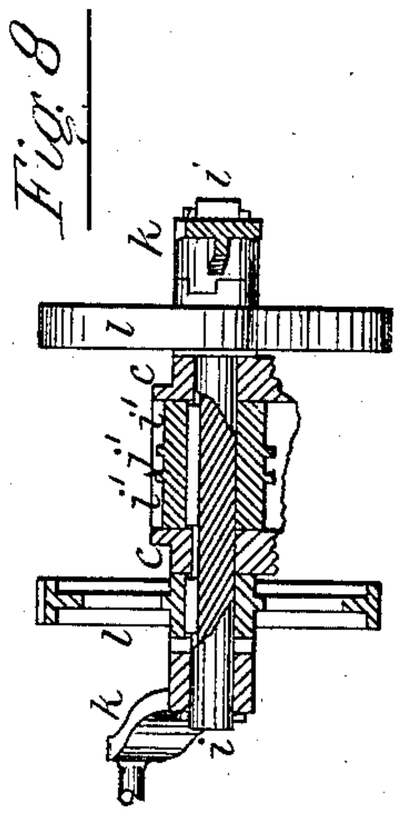


Fig. 8

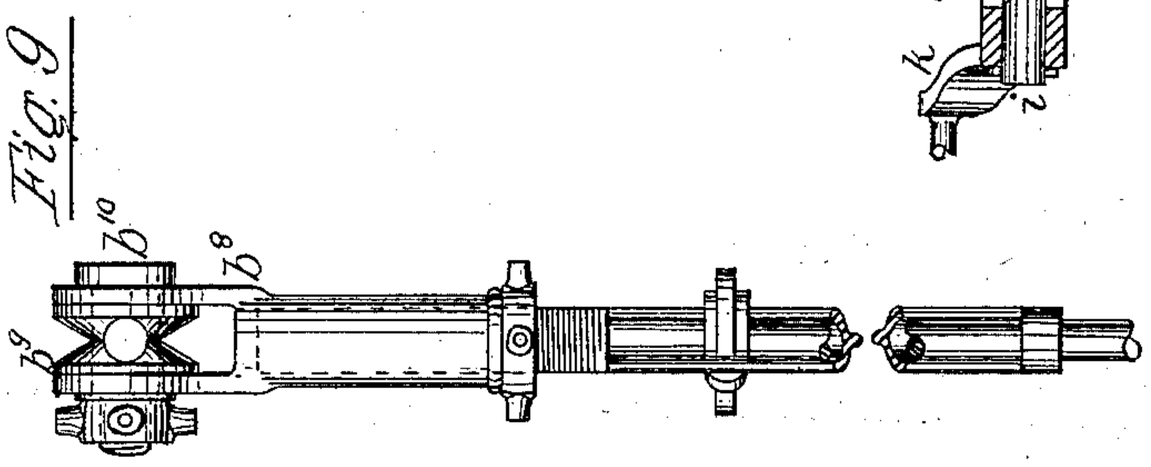


Fig. 9

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UNITED STATES PATENT OFFICE.

ALFRED SHEDLOCK, OF BROOKLYN, NEW YORK.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 285,516, dated September 25, 1883.

Application filed October 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SHEDLOCK, of Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Rock-Drilling Machines, of which the following is a specification.

This invention relates to hand-power rock-drilling machines, and particularly to improvements in the construction of the various parts of the machine patented February 28, 1882, and numbered 254,393.

Figure 1, Sheet 1, represents a longitudinal sectional elevation of the machine. Fig. 2, Sheet 2, is a plan view of the same. Fig. 3, Sheet 1, is a transverse section through the line *x x*. Fig. 4, Sheet 1, is a transverse section through the line *y y*. Fig. 5, Sheet 1, is a section of the upper part of rear supporting-legs. Fig. 6, Sheet 1, is a transverse section of one of the legs. Fig. 7, Sheet 1, is an end view of the drill-chuck open. Fig. 8, Sheet 2, is a transverse section on the line *z z*, Fig. 2. Fig. 9, Sheet 2, is a view of the front leg, detached from the machine; and Fig. 10, Sheet 2, is a side view of part of the body, showing the protecting-covers.

The machine described in the before-mentioned Patent No. 254,393 and the present invention are similar as regards the relative positions of the various devices and general construction, so I only deem it necessary to describe such parts as show novelty in construction and combination, and to facilitate comparison of the two inventions, similar letters of reference are employed to indicate corresponding parts.

The body of the machine $c\ c'\ c^2\ c^3\ c^4$, the frame $a\ a'\ a^2\ a^4$, the cams $l\ l$, the hammer $m\ m'\ m^2$, with solid bearing-faces $m'\ m'$ for the cams $l\ l$, instead of rollers, the spring q, the plunger f', feed-screw $d\ d'$, and nut-frame e are constructed substantially as shown in the before-mentioned Letters Patent, so further reference to the same here is unnecessary.

The improvements in the adjustable supporting-legs consist in making the upper part of each of the two rear legs, $b\ b$, with a semi-cylindrical groove and socket at the lower ends, in and through which slide longitudinally the lower rods, $b'\ b'$, provided at their upper ends with the clamps $b^2\ b^2$, shaped so as to pass around the parts $b\ b$, and having thumb-screws $b^3\ b^3$, adapted to be set in the notches $b^4\ b^4$, to hold the parts firmly together when the legs are once adjusted to the desired length. At the tops of the parts $b\ b$ are formed spherical cups, which fit into corresponding recesses in either side of the projection a^3 on the end piece, a, of the frame. These spherical cups have elongated holes, through which and a central hole in the projection a^3 is passed the clamping-bolt, provided with the nut b^5. Under the head of the clamping-bolt, and under the nut b^5, are placed spherical washers, which fit the concave sides of the cups on the ends of the parts $b\ b$. By this arrangement both of the rear legs may be set in any desired position and clamped rigidly to the frame by means of the one clamping-bolt and nut b^5.

The front leg is shown in Figs. 1 and 4, consisting of a tube, b^6, and extensible rod b^7; but in practice it is preferable to construct this part of the leg similar to the rear legs, as shown in Fig. 9, with the semi-cylindrical part, having a screw-thread formed thereon in place of the spherical cup, which screw-thread fits in the socket of the yoke b^8, and in the bifurcated part of this yoke are placed the two washers b^9, through which and the arms of the yoke is passed the bolt b^{10}. The washers have slots and the bolt has pins, by which means they are caused to turn in the yoke together, and a hole is formed through them to admit the end of the pointed side bar, a', or the stud a^4 of the frame, the hole in the bolt being larger than the bar a' or stud a^4, so that when the nut on the bolt b^{10} is screwed up the washers b^9 are caused to clamp the rod a' or stud a^4, preventing the leg from rotating thereon, and the inner sides of the yoke embrace firmly the sides of the washers, preventing the leg from turning on the bolt b^{10}. By this construction it is seen that this leg may be adjusted and clamped in any desired position, either on the bar a' or stud a^4, and the front end of the frame forced against the rock by means of the screw-thread on the end of semi-cylindrical-grooved part.

The plunger f' is constructed and actuated substantially as described in the before-men-

tioned Letters Patent. Its end passes through the cylindrical part h^2 of the sliding head h, and the compensating-spring h^4 is placed over the reduced portion of it inside the head h. On the extreme end is screwed the socket n', which receives the blows of the hammer m, instead of being screwed into the spindle, as heretofore. This blow-receiving socket holds the worm-wheel j against a shoulder on the spindle, the worm-wheel and socket being secured together by means of a dowel-pin, so that the whole rotates together when the worm-wheel j is actuated by means of the worm-cam j'. The worm-wheel j and socket n' may be made of one piece of metal, if desired.

The improvement in the sliding head h and its actuating-cams consists in making the horns or bearers h^2 h^3 and the cams i' so that each working-point of the cams works against the horns h^2 h^3 alternately, and so imparts to the sliding head the required reciprocating movement twice to each revolution of the main shaft i. These parts are hereby made much stronger, having twice as wide bearing-surfaces as heretofore, without necessitating any increase in their sizes. The main shaft i is provided with splines, which fit into keyways cut in the cams i' l l'. The hubs of the cams l l' have clutch-teeth formed thereon, into which interlock corresponding clutch-teeth, formed on the hubs of the handles k k, said handles being held on the shaft i by means of split pins.

The feeding device consists of the bell-crank lever or pawl d^3, supported on the shaft d^5, which has bearings in the sides of the box part of the body c. The lower end, f, of this pawl d^3 fits into the annular groove formed in the plunger f', and the other end, d^4, is shaped so as to catch over the teeth of the ratchet-wheel d^2 on the end of the feed-screw d. The spring d^6 on the shaft d^5 forces the pawl over the edge of the tooth of the ratchet when the end d^4 moves up sufficiently high to clear the edge of the tooth. This only takes place when the plunger makes its full stroke, for when the drill strikes the rock the compensating-spring h^4 is slightly compressed, and the plunger f' does not move forward its full limit until the hammer m has driven the drill sufficiently into the rock, and with certain kinds of rocks several blows of the hammer are required to cause the drill to cut as far as the body is fed forward for each movement of a tooth of the ratchet-wheel d^2. The ratchet-wheel d^2 is prevented from turning backward by means of the flat spring d^7, which is placed in the corner of the box part of the body, as shown at Figs. 2 and 3.

It was suggested in the before-mentioned Letters Patent No. 254,393 that the principal working parts could be protected by covers. These covers I construct and apply in such a manner that, as well as acting as protectors to the working parts, they retain some of them in position. The cover r slides up between the guiders c' c' in front of the short ribs r', and its lower part is turned over, so as to embrace the flange c^5 on the bottom of the body. The striking-socket n' projects through a hole in this cover. The top cover, s, fits over the box part of the body. Three of its sides are provided with flanges, and the fourth side slides under the right-angle flange r^2 on the cover r, thereby holding and locking the cover r in place. At the same time this end of the cover s is held down by the said flange r^2. The other end of the cover s is held down by means of a pin, s', secured in the flange and arranged to fit into a hole formed in the end of the box part of the body. To prevent the cover s from sliding forward a flat spring, s^2, is riveted to its under side and catches over the inner edge of the body, passing through a slot, s^3, (shown at Fig. 2,) as the cover is slid on the body. The end of this spring projects beyond the body, providing a means by which it may be raised when it is desired to remove the covers. This cover s holds the spring d^7 down in the corner of the box part of the body, and also prevents the shaft d^5 of the pawl d^3 from working out of its bearings in the side of the box by means of the ears s^4, forming parts of the flanges on the side of the cover. By this arrangement the employment of pins and screws for holding the working parts in place is avoided, obviating the possibility of any of the parts becoming deranged when the machine is operated, and enabling the parts to be separated for the purpose of cleaning, &c., without the necessity of using any other tool than the simple wrench employed for tightening the clamping-nuts of the legs, &c.

The improvements in the construction of the nut-frame e and half-nuts e^2 are clearly shown in Fig. 4. The half-nuts e^2 surround the cylindrical part of the body c, and are held in place by means of the lower part of spring e^3, which causes them to embrace the screw d when the lever e^4 is thrown back, as shown. The nuts and spring fit into the hollow nut-frame e, and the spring e^3 is the only part secured thereto by means of the two screws or rivets e^5 e^5.

To enable the drill f^2 to be readily placed in and removed from the chuck secured to the end of the plunger f', this chuck consists of the body t and hinged cover t', having an open slot-ear, in which the eyebolt t^2 passes when the cover is closed down upon the drill-shank, said eyebolt being provided with nuts, by means of which the drill-shank is firmly gripped in the chuck. Fig. 7 shows an end view of the said improved chuck open to receive a drill.

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

1. In combination, the sliding head h, provided with two sets of bearers, h^2 h^3, the cams i', adapted to work alternately against the bearers h^2 h^3, the blow-receiving socket n', the

worm-wheel j, the worm-cam j', the compensating-spring h^4, and the spindle f', substantially as set forth.

2. In combination, the bell-crank pawl d^3, the ratchet-wheel d^2, the plunger f', the spring d^6, and mechanism, substantially as described, by means of which the plunger is caused to reciprocate, as set forth.

3. The plunger f', compensating-spring h^4, and sliding head h, in combination with bell-crank pawl d^3, spring d^6, and ratchet-wheel d^2 on the feed-screw d, substantially as set forth.

4. In combination, the body c, the cover r, provided with flanges, and the cover s, provided with flanges and retaining-spring s^2 and pin s', substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand, at New York, county and State of New York, this 9th day of October, A. D. 1882.

ALFRED SHEDLOCK.

Witnesses:

J. H. GREENSWARD,

H. D. WILLIAMS.