(No Model.)

W. S. SHARPNECK.

ROCK DRILL.

No. 432,679. Patented July 22, 1890.

Fig. 1.

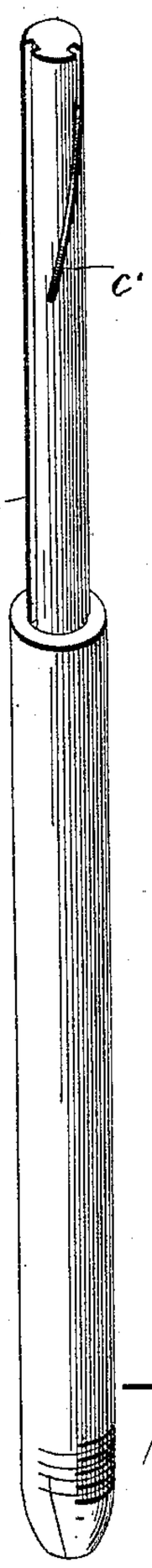

Fig. 2.

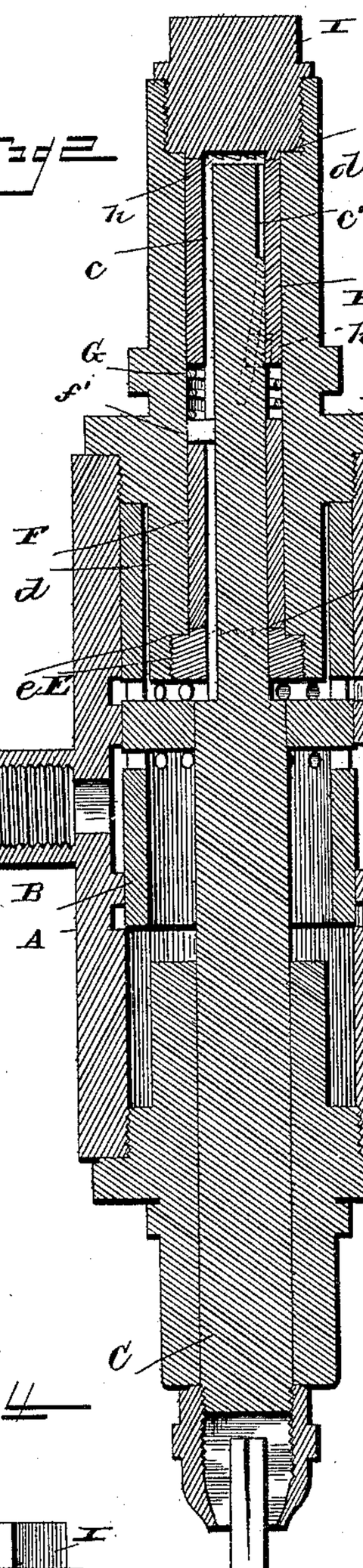

Fig. 3.

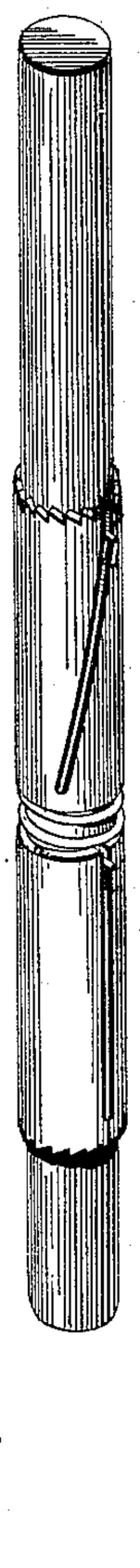

Fig. 4.

Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM S. SHARPNECK, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FRANCIS T. WHEELER, OF SAME PLACE.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 432,679, dated July 22, 1890.

Application filed May 6, 1890. Serial No. 350,779. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. SHARPNECK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

This improvement is more especially designed for use with the apparatus patented by me July 26, 1887, No. 367,119, but may be used with other devices with equally-good effect; and the invention consists in the peculiar construction, arrangement, and combination of parts hereinafter more particularly described, and then definitely claimed.

In the accompanying drawings, Figure 1 is a vertical central section of my improvement; Fig. 2, a perspective view of the piston-rod. Fig. 3 is a similar view of a modification. Figs. 4 and 5 are elevations of detached parts shown in section in Fig. 1.

Referring now to the details of the drawings by letter, A represents the cylinder of the engine before referred to, B the piston thereof, and C the piston or drill-rod having a vertical groove *c* and an inclined or spiral groove *c'*.

D is a cap screwed into the end of the cylinder and extending down inside the same. Screwed into the bottom of the extension *d* is a ring E, having ratchet-teeth *e*, above which is a tube F, also having ratchet-teeth *f*, meshing with the ratchet-teeth *e* and having at its upper end a spline *f'*, which engages in the vertical groove *c* in the piston-rod C. Above this is a spiral spring G, and above this again is another tube H, having ratchet-teeth *h* and a spline *h'*, which engages in the spiral or inclined groove *c'*. Screwed into the upward extension *d'* of the cap D is a plug I, having ratchet-teeth *i* engaging with the teeth *f* of the tube F.

The operation is as follows: Motion being given to the piston or drill-rod in any suitable manner, as it descends the inclined groove *c'*, acting on the spline *h'*, causes the tube H to slip under the teeth of the plug I and turn a small portion of a revolution equivalent to the inclination of said groove, and the spring G reacting causes the teeth of the tube H to engage with the teeth of the plug, and thus prevents its moving backward. As the drill or piston rod rises, the spline *h'*, being engaged in the inclined groove *c'*, and the tube being prevented from moving backward, as above described, the piston-rod is consequently caused to turn in accordance with the inclination of the groove, and as it turns, the spline *f* being in the vertical groove *c*, causes the tube F to turn with said rod, slipping over the teeth *e* of the ring E, and then dropping its teeth *f* into said teeth *e*, where they are held by the spring G until the next motion of the drill or piston rod, whereby an intermittent rotary motion of the drill is kept up at every upstroke of the same. It is evident that the position of the grooves and splines may be reversed—that is to say, the grooves may be in the tubes and the splines fast in the piston or drill rod, as shown in Fig. 3. By this construction a very rapidly-working drill may be turned positively at every stroke, and with an apparatus that is very durable and not likely to get out of order.

What I claim as new is—

1. The combination, with a drill or piston rod, of two tubes having ratchet-teeth on their ends engaging with stationary teeth arranged in the support for the rod, said rod and tubes being connected together by pins in one engaging in the grooves in the other, substantially as described.

2. The combination, with a drill-rod C, having a vertical groove *c* and inclined groove *c'*, of the tubes F and H, each having ratchet-teeth at one of its ends and a pin at the other end, the ring E and plug I, each having ratchet-teeth, and the spring G, set between the tubes, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 5th day of May, 1890.

WILLIAM S. SHARPNECK.

Witnesses:

T. J. W. ROBERTSON,

FRANCIS W. WHITE.