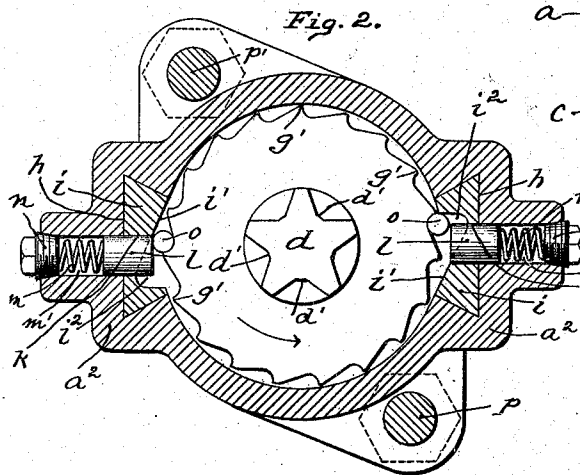
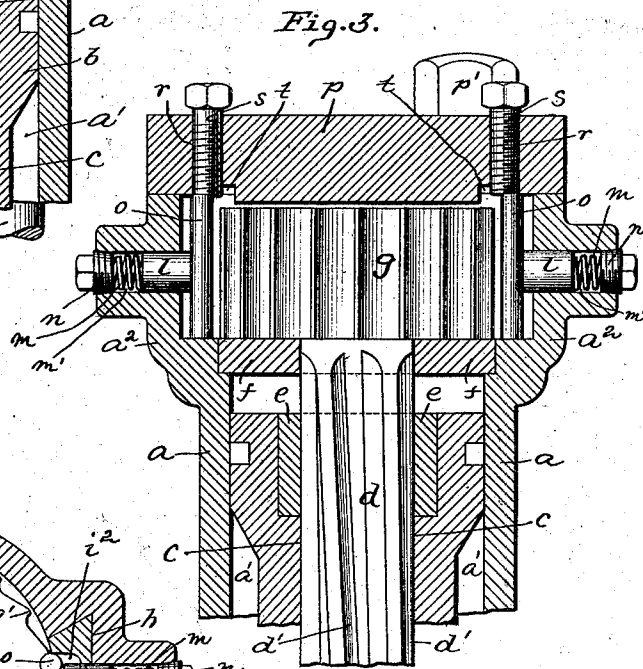
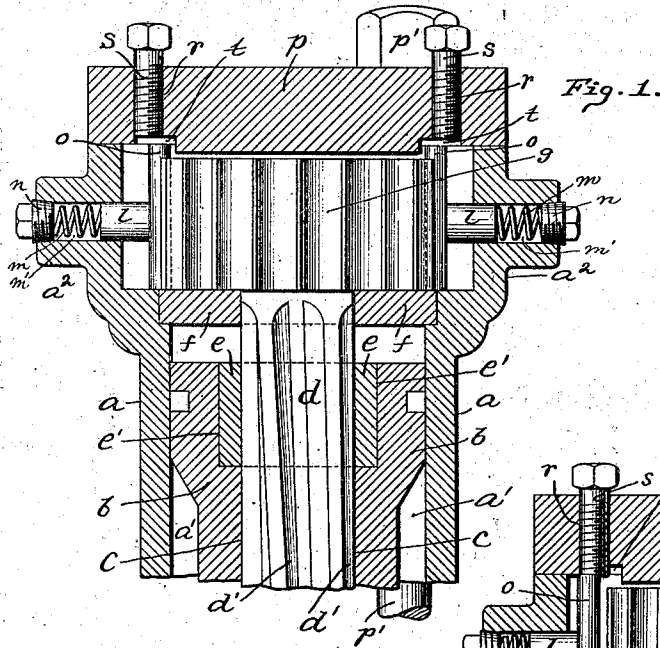


(No Model.)

T. OFFICER
ROCK DRILL.

No. 580,463.

Patented Apr. 13, 1897.



Witnesses:

Walter Tamariss
Robert C. Totten

Inventor:

Thomas Officer
By Kay & Totten
Attorneys.

UNITED STATES PATENT OFFICE.

THOMAS OFFICER, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO
THE SULLIVAN MACHINERY COMPANY, OF SAME PLACE AND CHI-
CAGO, ILLINOIS.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 580,463, dated April 13, 1897.

Application filed August 12, 1896. Serial No. 602,500. (No model.)

To all whom it may concern:

Be it known that I, THOMAS OFFICER, a resident of Claremont, in the county of Sullivan and State of New Hampshire, have invented a new and useful Improvement in Rock-Drills; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to rock-drills.

The special form of rock-drill to which my invention is applicable is that in which a cylinder is employed with a piston operating therein and a spiral rifle-bar working in a nut in the piston, together with mechanism at one end of said rifle-bar for permitting of the rotation of the rifle-bar upon the descent of the piston, but holding said rifle-bar from rotation upon the upward stroke of the piston, whereby the piston itself is turned upon the upward stroke.

The present invention relates to an improved form of mechanism for holding the rifle-bar during the upward stroke of the piston.

My invention comprises certain new features in this form of mechanism, all of which will be fully hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a sectional view of the upper part of a common form of rock-drill to which my invention has been applied. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a vertical sectional view showing the rollers held out of engagement with the ratchet-head.

Like letters indicate like parts in each of the figures.

As the form of rock-drill to which my invention is applicable is so well known, I have not deemed it necessary to illustrate the valve mechanism and the lower part of the apparatus, as there are different forms of valve mechanism which may be used, and such valve mechanism forms no part of my invention.

The letter *a* represents the upper portion of a suitable cylinder having a piston-chamber *a'* therein, together with valve-controlled

ports (not shown) for admitting steam to the ends of said piston-chamber. Within the chamber *a'* is the piston *b*, whose rod extends down therefrom and which has attached thereto a suitable drill-bit. The piston *b* has the cavity *c* formed therein, adapted to receive the rifle-bar *d*. This rifle-bar has the spiral grooves *d'* formed therein, said grooves engaging with the rifle-bar nut *e*, secured within a recess *e'* at the upper end of said piston. The upper end of the rifle-bar *d* passes through an opening in the division-collar *f*, and on the upper end of said rifle-bar is a ratchet-head *g*. This ratchet-head *g* has the teeth *g'* formed in its circumference. The upper end of the cylinder *a* has the enlargement *a''*, and within the walls of said enlargement *a''* are formed the dovetailed seats *h*, within which are placed the dovetailed blocks *i*. These dovetailed blocks *i* have the inclined faces *i'* and the recesses *i''*, formed on their inner faces. The blocks *i* are arranged at opposite points, but may be spaced as desired, in the enlargement *a''* of the cylinder and have the openings *k* therein, into which the plugs *l* are inserted. Springs *m* in recesses *m'* of the enlargement *a''* press against said plugs, and the nuts *n*, screwing in said recesses *m'*, hold said springs in position. Engaging with the teeth *g'* of the ratchet-head *g* are the rollers *o*, said rollers being normally forced into engagement with said ratchet-head by means of the plugs *l*. The rollers *o* also engage with the inclined faces *i'* of the blocks *i*.

Resting on the upper end of the cylinder is the head *p*, which is secured to said cylinder by means of the bolts *p'*. This head does not rest upon the ratchet-head *g*, but space is left between them to provide for the ready movement of said ratchet-head. Passing down through threaded openings *r* in the head *p* are the set-screws *s*, said set-screws being placed in such position as to engage with the upper ends of the rollers *o* when said rollers are forced into the recesses *i''* in the blocks *i*, as will more fully hereinafter appear. The rollers *o* extend above the ratchet-head *g* into recesses *t*, formed in the lower face of the head *p*.

When my improved rock-drill is in operation and it is desired to turn the piston on the upward stroke of the same, the parts will be in the position shown in Figs. 1 and 2. In that case as the piston descends the rifle-bar *d* will be turned in the direction of the arrow, Fig. 2, the rollers *o* permitting of the turning of the ratchet-head *g* in that direction, owing to the fact that said rollers being pressed against the plugs *l* by the teeth *g'* will push back said plugs to permit said rollers to move into the recesses *i*², formed by the inclined faces *i'* of the blocks *i*. Upon the ascent of the piston, however, the rifle-bar is held from rotation, as one of said rollers *o*, engaging with the inclined face *i'* of the blocks *i*, prevents the ratchet-head from turning in the opposite direction, so that the piston will turn upon its ascent. When it is desired to "broach," as it is termed, and in which case the piston is not revolved, by turning the piston slightly the ratchet-head will be turned in the direction indicated by the arrow in Fig. 2, whereupon the rollers will force back the plugs *l* and take position in the recesses *i*². The set-screws *s* are then lowered while the rollers *o* are in this position, and pressing down upon the upper end of said rollers holds said rollers in said recesses away from engagement with the teeth *g'* of the ratchet-head *g*. In this way the ratchet-head is free to turn in either direction, and consequently the piston does not revolve upon its upward stroke. Upon releasing said set-screws *s* the plugs *l*, actuated by the springs *m*, will immediately force the rollers *o* back into engagement with the teeth of the ratchet-head. What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a rock-drill, the combination with a suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head and inclined recesses on the inner face of said cylinder, substantially as set forth.

2. In a rock-drill, the combination with a suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head and inclined recesses on the inner face of said cylinder, and springs for holding said rollers in engagement with said ratchet-head, substantially as set forth.

3. In a rock-drill, the combination with a

suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head, dovetailed blocks fitting in corresponding recesses in said cylinder, said blocks having inclined recesses therein adapted to receive said rollers, and springs for holding said rollers in engagement with the teeth of said ratchet-head, substantially as set forth.

4. In a rock-drill, the combination with a suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head, said cylinder having recesses therein adapted to receive said rollers, and means for locking said rollers within said recesses, substantially as set forth.

5. In a rock-drill, the combination with a suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head, said cylinder having recesses formed therein adapted to receive said rollers, and set-screws adapted to engage the upper ends of said rollers and hold them within said recesses, substantially as set forth.

6. In a rock-drill, the combination with a suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head and inclined recesses within said cylinder, and yielding plugs adapted to hold said rollers normally in engagement with the teeth of said ratchet-head, substantially as set forth.

7. In a rock-drill, the combination with a suitable cylinder having a reciprocating piston therein, of a spiral rifle-bar engaging said piston, a ratchet-head on said rifle-bar, rollers engaging the teeth of said ratchet-head and inclined recesses formed in dovetailed blocks fitting within corresponding seats in said cylinder, plugs passing through said dovetailed blocks and adapted to bear against said rollers, springs in the rear of said blocks, and screws bearing against the outer ends of said springs, substantially as set forth.

In testimony whereof I, the said THOMAS OFFICER, have hereunto set my hand.

THOMAS OFFICER.

Witnesses:

H. H. MERCER,
FRANK A. BALL.