

(No Model.)

H. C. SERGEANT.
DEVICE FOR OPERATING FEED OF ROCK DRILLING AND CHANNELING
MACHINES.

No. 589,864.

Patented Sept. 14, 1897.

Fig. 1.

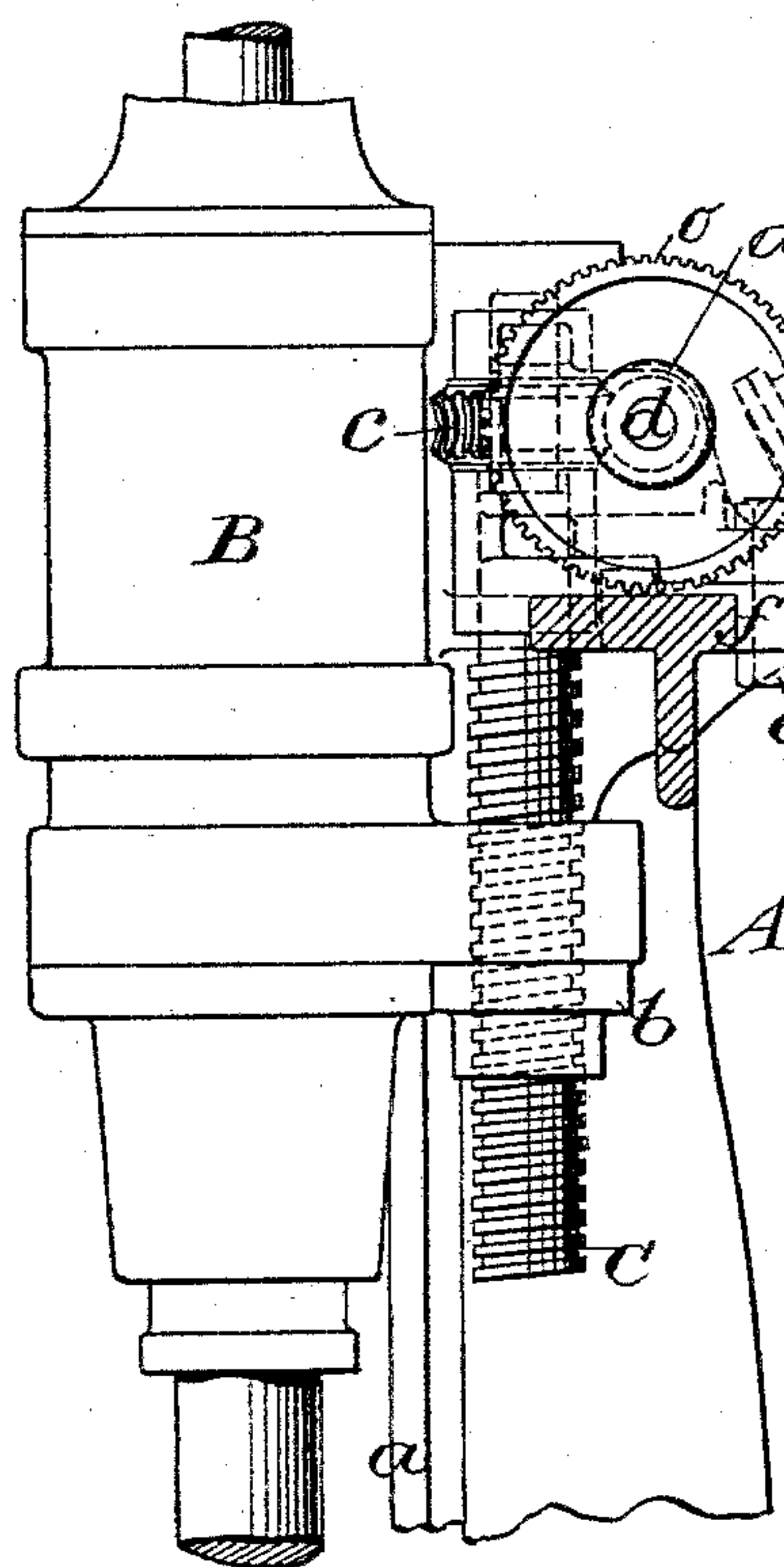


Fig. 2.

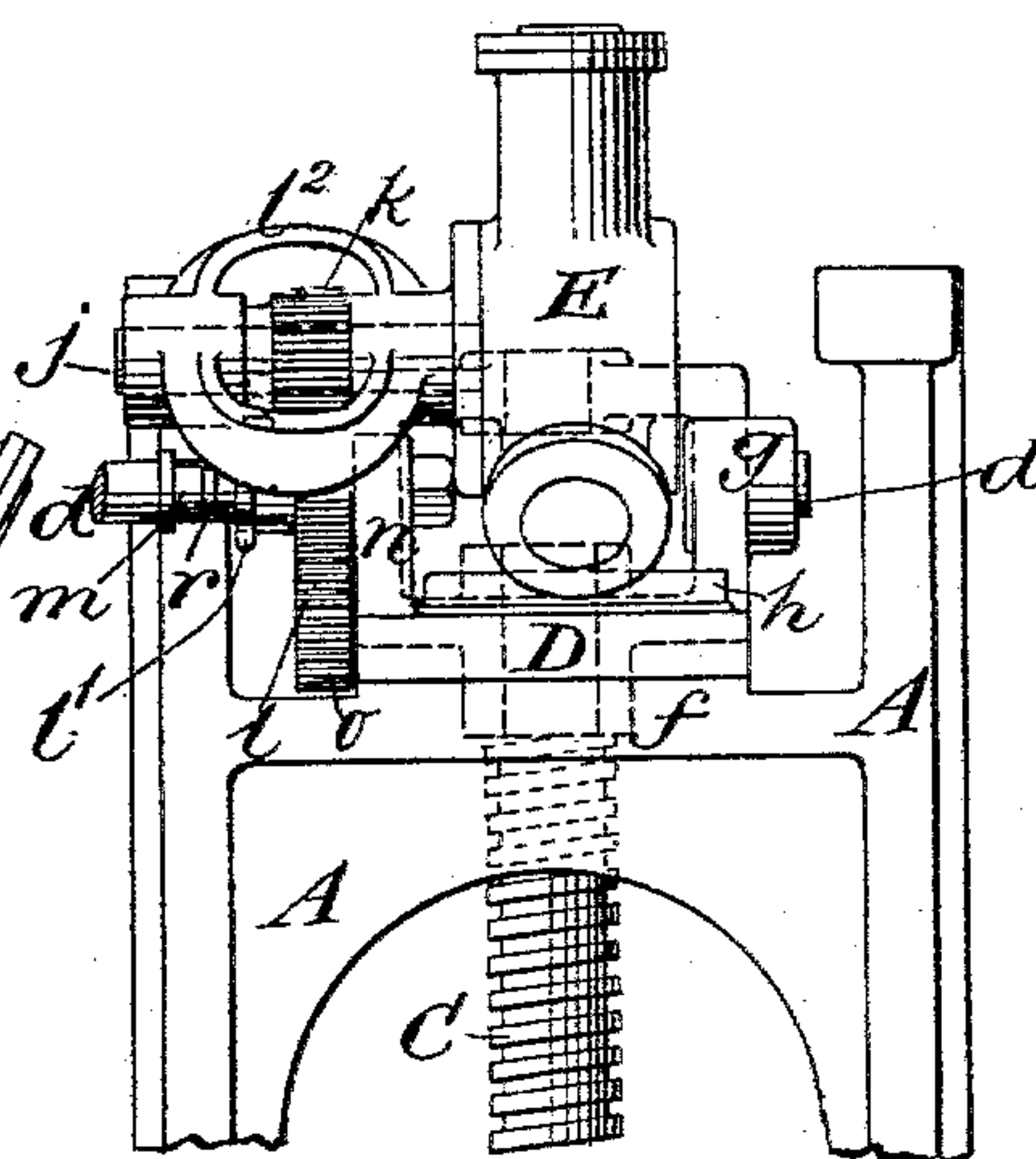


Fig. 4.

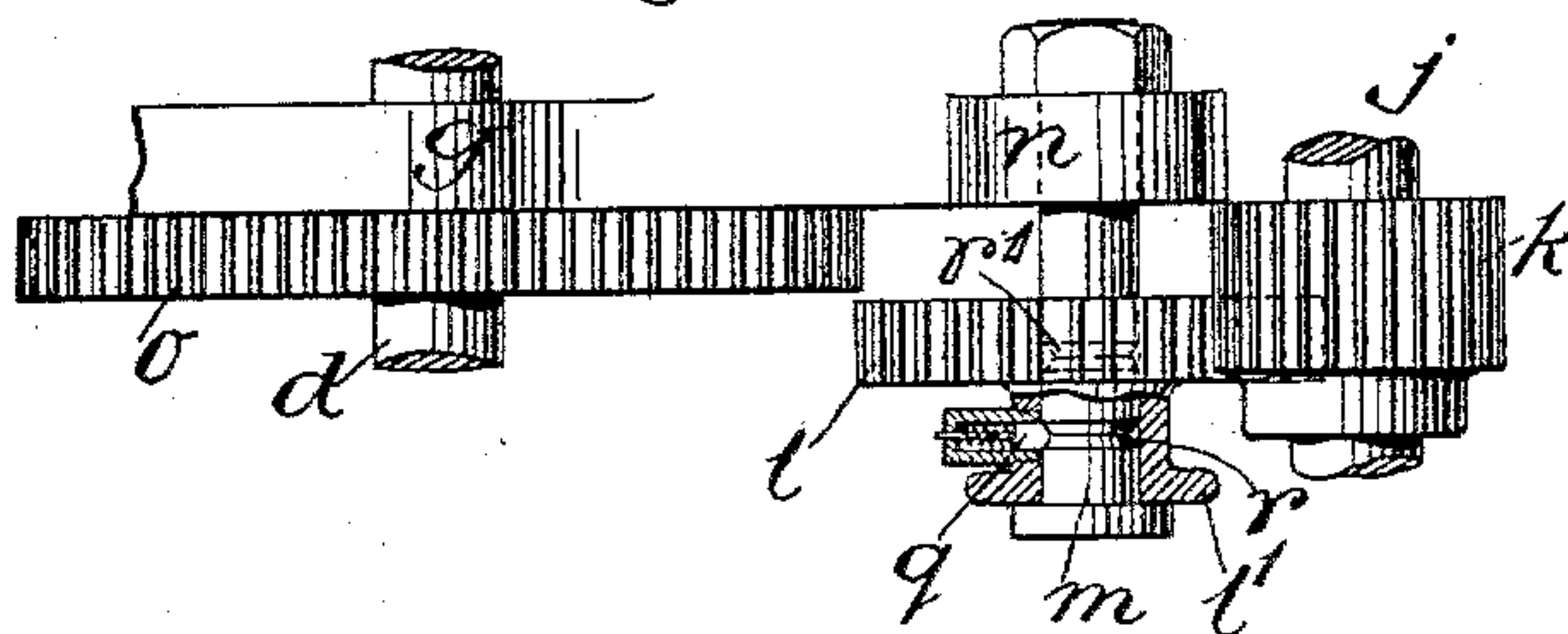
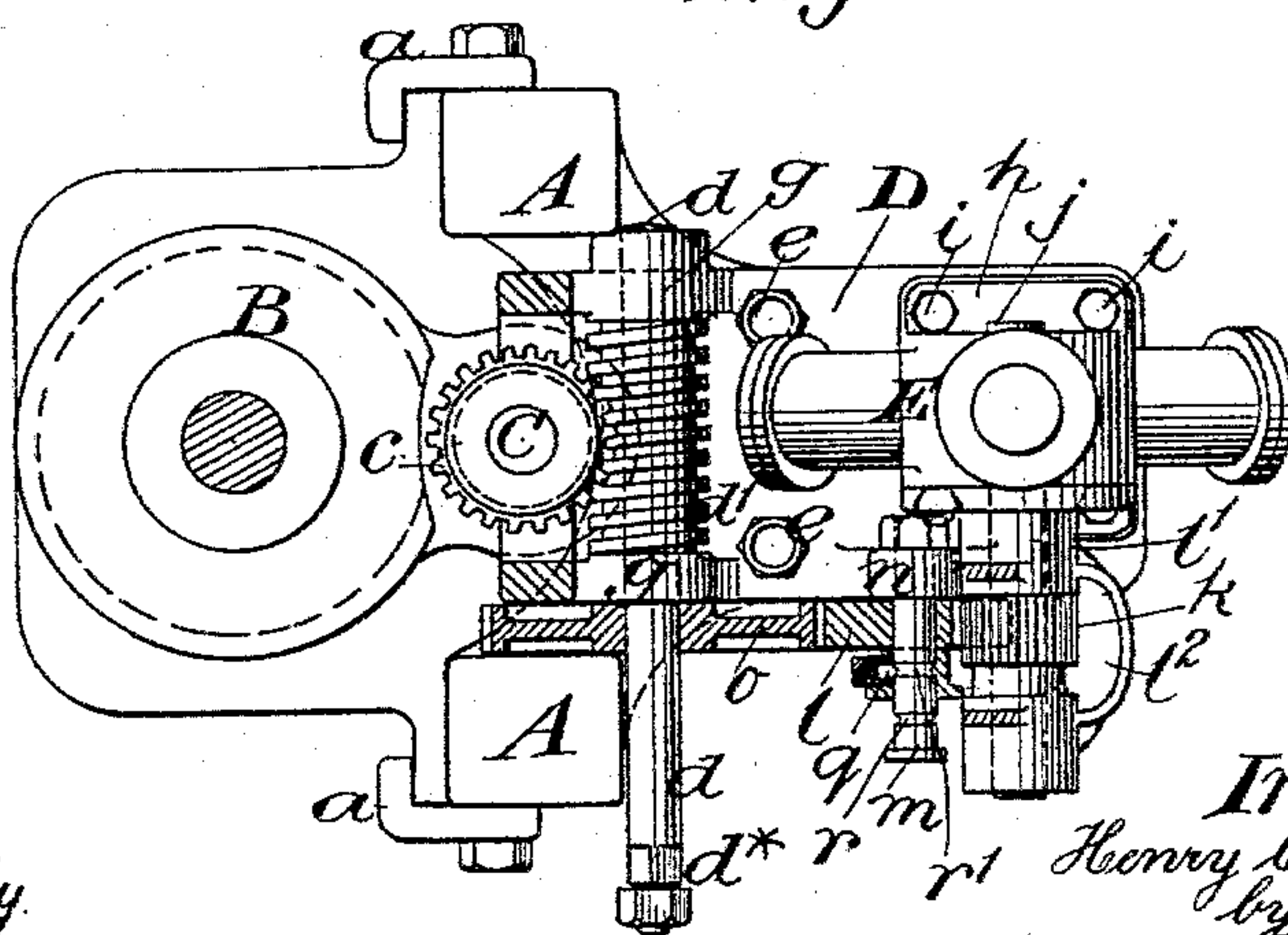


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY C. SERGEANT, OF WESTFIELD, NEW JERSEY, ASSIGNOR TO THE
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DEVICE FOR OPERATING FEED OF ROCK-DRILLING AND CHANNELING MACHINES.

SPECIFICATION forming part of Letters Patent No. 589,864, dated September 14, 1897.

Application filed October 21, 1896. Serial No. 609,513. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SERGEANT, of Westfield, in the county of Union and State of New Jersey, have invented a new and useful Improvement in Devices for Operating the Feed of Rock-Drilling and Channeling Machines, of which the following is a specification.

This invention is more especially designed for what are known as "channeling-machines," but is applicable to all machines for rock-drilling, quarrying, or channeling in which the feed for the depth of cut is effected by means of a screw which moves the drill-cylinder lengthwise within a guiding back or shell.

The object of the invention is to afford convenient and effective provision for applying power to the said screw for the purpose of raising or drawing back the cylinder and the drill or bit stock when it becomes necessary to change the drill or bits, which operation, when performed by hand, as is usual, is a very slow one, and, moreover, is very laborious, as not only has the weight of the cylinder, the piston, and the piston-rod to be lifted, but also the weight of the drill or bit stock and the drill or bits, which latter weight is often, especially in a channeling-machine, very considerable. To accomplish this object, I combine with the said screw, as hereinafter described, for the purpose of operating the same to lift or draw back the cylinder, piston-rod, stock, and drill or bits, a prime mover affixed to the drill-back and movable therewith in every direction in which the drill-back itself is capable of being moved.

In the accompanying drawings, Figure 1 represents a side view of the cylinder of a channeling or rock-drilling machine, the shell in which said cylinder slides lengthwise for the purpose of feeding the bits, and the mechanism for moving the cylinder lengthwise which constitutes this invention, the shell being represented in section. Fig. 2 is a front view of the shell and of the mechanism above mentioned. Fig. 3 is a plan view of the shell, the cylinder, and the aforesaid mechanism, part of which is shown in section. Fig. 4 is a horizontal sectional view corresponding with a portion of Fig. 3, but on a larger scale and showing the parts in different relation.

Similar letters of reference designate corresponding parts in all the figures.

A designates the drill-back or shell, of which only a sufficient portion to illustrate my invention is represented, and which may be supported in any suitable manner to provide for the adjustment of the drill-cylinder B at such angles or inclinations as may be desirable, according to the work to be performed. The cylinder B is represented as fitted to slideways *a a* on the shell, in or on which it is capable of being moved lengthwise in the usual manner by means of the screw C, which is arranged parallel with the cylinder alongside thereof and fitted to turn, but confined lengthwise in a bearing provided for it in the head of the shell, and the screw-thread of which works in a nut *b*, which is affixed to the cylinder. On the head of this screw is the usual worm-gear *c*, which engages with an endless screw *d'* on a shaft *d*.

D is a bracket, which is secured by bolts *e* to the flange *f* on the back of the shell A. This bracket contains or has upon it the bearings *g* for the shaft *d* of the endless screw *d'*, and it also has arranged upon it the small special or independent prime mover E for operating the said screw. This prime mover may be of any suitable kind, either a steam or compressed-air engine or an electric motor. It is represented as a three-cylinder steam-engine of a well-known kind having its base-plate *h* bolted to the bracket D by bolts *i*. The shaft *j* of the said engine is represented as extended through bearings *l'* in the yoke *l*², which is secured to the framing of the engine, and as carrying within the said yoke a spur-gear *k*, which gears with and drives an intermediate spur-gear *l*, which turns loosely on a fixed stud *m*, carried by a small standard *n* on the bracket D, and this spur-gear *l* gears with and drives the spur-gear *o*, which is fast on the screw-shaft *d*. The said shaft *d* is represented as having one end prolonged beyond one side of the shell A, as shown at *d** in Fig. 3, for the attachment of a hand-crank for turning the screw *d'* by hand when it may not be desirable or convenient to use the engine.

In order to provide for disengaging the screw-shaft *d* from the engine when the screw *d'* is to be worked by hand and for reëngag-

ing it for working by power, the spur-gear k is made with a broader face than l and o and the loose gear l is made capable of sliding lengthwise on the shaft to a position shown in Fig. 3, in which it gears with both k and o for working the screw d' by power, or to a position in which it leaves o free for turning the screw-shaft by hand, as shown in Fig. 4. To secure the gear l in either of the above positions, a spring-pressed locking-pin q is fitted to the outwardly-projecting hub of the said gear to enter one or other of two circumferential grooves r r' in the stud m , the said pin having a conical or beveled point and the grooves r r' being of corresponding form, so that the attendant by taking hold of a flange l' provided on the outer end of the hub may shift the gear from one to the other of the positions described, the pin q as he does so being allowed by the yielding of its spring to pass out of one groove and being caused by its spring to enter the other.

The prime mover employed in carrying out this invention when actuated by steam or other motive pressure may have the said fluid supplied to it through a flexible pipe from any suitable generator or reservoir, or when actuated by electricity will be supplied through a flexible conductor.

The arrangement of the engine and the gearing through which it engages with the gear on the feed-screw all upon one bracket to be attached to the drill-back or part of the machine upon which the drill-cylinder moves lengthwise affords great facility for applying my invention to existing machines.

It is only for the purpose of illustrating my invention in a way which may be easily understood that I have represented the prime mover as arranged on the drill-back or shell

of an ordinary machine. I should consider as the equivalent of the shell or drill-back any part of a channeling or drilling machine on which the drill-cylinder moves lengthwise, but which must move with the cylinder to set it and the drill or bits at different angles or inclinations.

What I claim as my invention is—

1. In a rock-drilling or channeling machine, the combination with the drill-cylinder, the drill-back to which said cylinder is fitted to move lengthwise but which otherwise moves only with the cylinder, and a screw arranged parallel with the said cylinder for effecting said movement lengthwise, of a prime mover carried by the drill-back to move therewith in all directions and geared with the said screw for the purpose of applying thereto the power for raising or drawing back the cylinder, the drill or bit stock and the drill or bits, substantially as herein described.

2. The combination with the drill-cylinder, the drill-back on which the said cylinder moves lengthwise, a screw arranged parallel with the cylinder but confined lengthwise to the drill-back, a nut affixed to the cylinder and fitting said screw, and a shaft arranged upon the drill-back and geared with said screw for operating it by hand, of a prime mover arranged on the drill-back and gears between the said prime mover and said shaft one of which gears is movable for disengaging the prime mover from said shaft to permit its use by hand, substantially as herein described.

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Witnesses:

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