

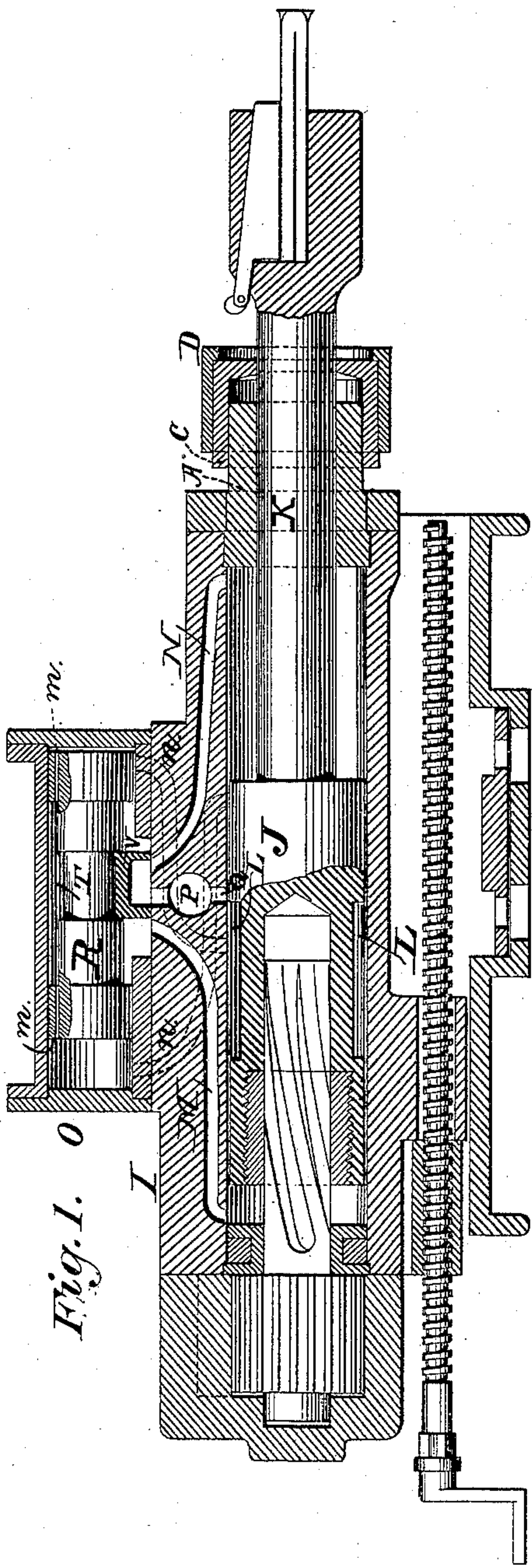
(No Model.)

DE VOLSON WOOD.

## ROCK DRILL.

No. 316,716.

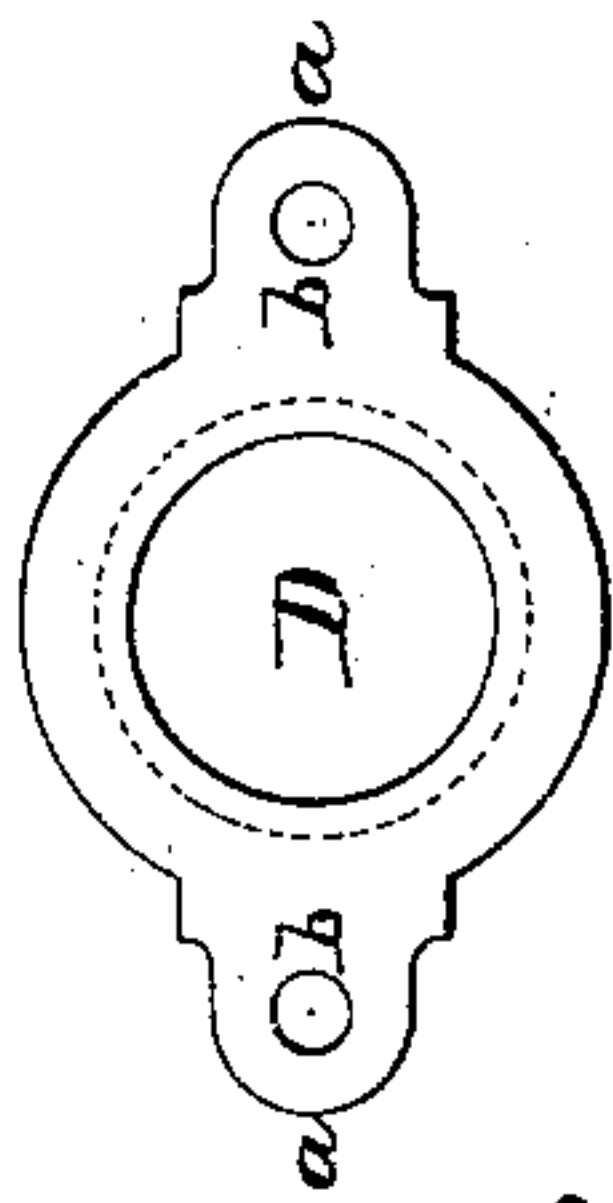
Patented Apr. 28, 1885.



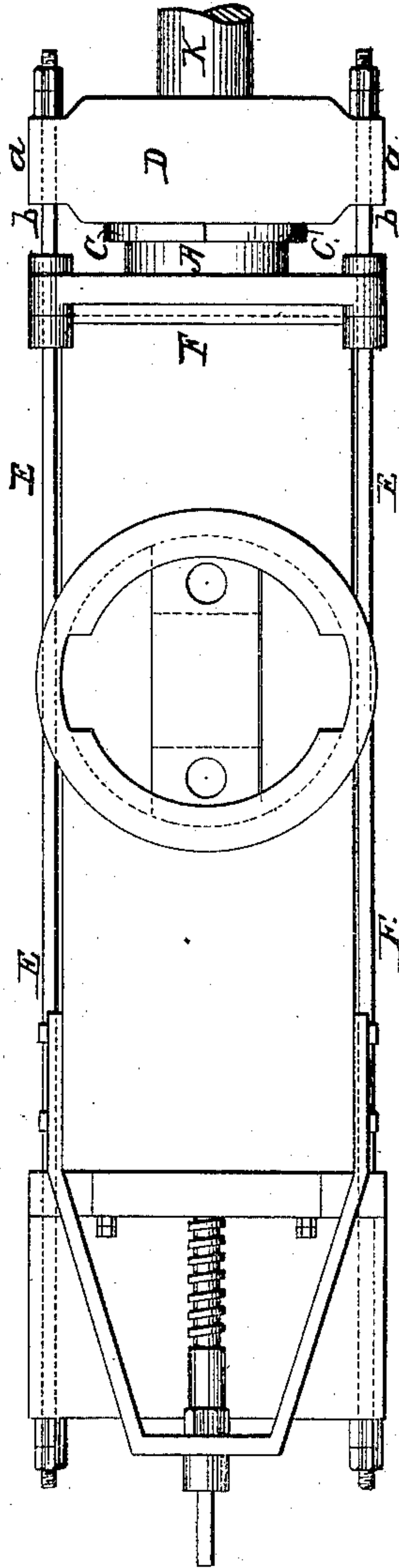
*Fig. 1. 0*



*Fig. 4.*



*Fig. 3.*



*Fig. 2.*

~~WITNESSES:~~

*Justave Diénitch*

Chas. C. Gill

INVENTOR

INVENTOR  
De Volson Wood



# UNITED STATES PATENT OFFICE.

DE VOLSON WOOD, OF BOONTON, NEW JERSEY.

## ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 316,716, dated April 28, 1885.

Application filed July 12, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, DE VOLSON WOOD, a citizen of the United States, and a resident of Boonton, in the county of Morris and State of New Jersey, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification.

The invention relates to improvements upon rock-drills operated by steam or compressed air; and it consists, first, in an improved stuffing-box and gland, and, second, in an improved arrangement of means for controlling and admitting the steam or compressed air to the piston carrying the tool.

The invention will be more fully understood from the description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section of a machine embodying the elements of the invention. Fig. 2 is a bottom view of same. Fig. 3 is an end view of the stuffing-box, and Fig. 4 is a sectional view of same.

Heretofore the packing at the front end of the piston-rod has been secured by screwing a cap onto the gland or by screwing the gland into a cavity formed for that purpose; but the constant jar to which the machine is subjected by the tool striking the rock causes the thread to wear rapidly and soon makes the stuffing-box worthless, thus inducing expense in repairs. The object of the first part of my invention is to avoid this difficulty, and in carrying it into effect I make the gland and box without threads and secure the box by bolts and nuts, which may be easily replaced by an ordinary blacksmith when renewals are necessary.

In the drawings, A denotes the gland through which the piston-rod K passes, and which is cylindrical in outline. The box C fits upon the gland A, and is supported by the encompassing piece D, which is provided on opposite sides with ears *a*, containing apertures *b*, of appropriate size to receive the forward end of the rods E E, as indicated in Fig. 2. The rods E extend from one end to the other of the cylinder of the rock-drill, and, in addition to holding the front head, F, to the cylinder, extend forward, as indicated, through the ap-

ertures *b* in the piece D to receive the nuts which force the stuffing-box into position and hold it there. In the drawings the stuffing-box is made in segments, because the piston-rod and the enlarged chuck are one piece.

I am aware that glands and stuffing-boxes have been made on engines without screw-threads, and which have been secured by stud-bolts; but the peculiar structure of the rock-drill prevents the use of means which are common with ordinary engines.

Referring to the second part of my invention, I denotes an ordinary steam-cylinder inclosing the piston J and piston-rod K, to the forward end of which is attached the drilling-tool. The piston J has formed in it the annular groove or space L. The cylinder I is provided with the usual ports, M N, leading from the steam-chest O to the opposite ends of the piston J, and with the exhaust P, which has a port, Q, passing to the annular space L around the piston. The steam-chest O is of usual construction, and to it steam is admitted in the customary manner. The said steam-chest contains the piston R, which is recessed at T, forming an annular space between its ends, into which space small openings *m* lead from the ends of the chest. The usual sliding piece, V, is operated by the piston R, and from each end of the steam-chest passes downward to the cylinder I a port or channel, *n n*, as shown. The arrangement of the ports *n n* is such that whatever may be the position of the piston J one of them will open into the annular space L, while the other will be closed by the piston. The passages *m*, leading to the space around the piston R, are constantly open, and are smaller in diameter than the ports or channels *n n*.

The piston R, provided with passages *m*, as well as the sliding piece and the ports M N with the exhaust P, are elements well known, and they are not consequently sought to be claimed herein.

The main feature of the second part of the invention consists in the arrangement of the channels *n n* with reference to the space L and passages *m*, the effect of which is that steam is continually admitted into the space T around the piston R and exhausted by a larger open-

ing *n* into the space *L* around the main piston at alternate strokes, the other opening *n* being closed by the piston.

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

1. The combination, with a steam-cylinder, of a stuffing-box consisting of the parts *A C D*, and rods *E*, secured to the cylinder, the forward ends of the latter supporting the said stuffing-box, substantially as set forth.

2. In a rock-drill, the stuffing-box composed of the parts *A C D*, the latter having apertures *b*, in combination with the side rods, *E*, which enter said apertures and retain the stuffing-box in place, substantially as described.

3. The combination, with the steam-cylinder *I*, provided with the ports *M N*, and the

exhaust *P*, having a port, *Q*, passing to an annular space around the piston, of the piston *J*, provided with the annular recess *L*, connected with the exhaust, the piston *R*, provided with the small openings *m*, and the steam-chest *O* with the larger openings, *n*, and the piston *R*, also provided with the recess *T*, and into which the smaller openings, *m*, lead, the above parts being arranged and adapted to operate substantially as described.

Signed at New York, in the county of New York and State of New York, this 30th day of June, A. D. 1884.

DE VOLSON WOOD.

Witnesses:

CHAS. C. GILL,  
HERMAN GUSTOW.