

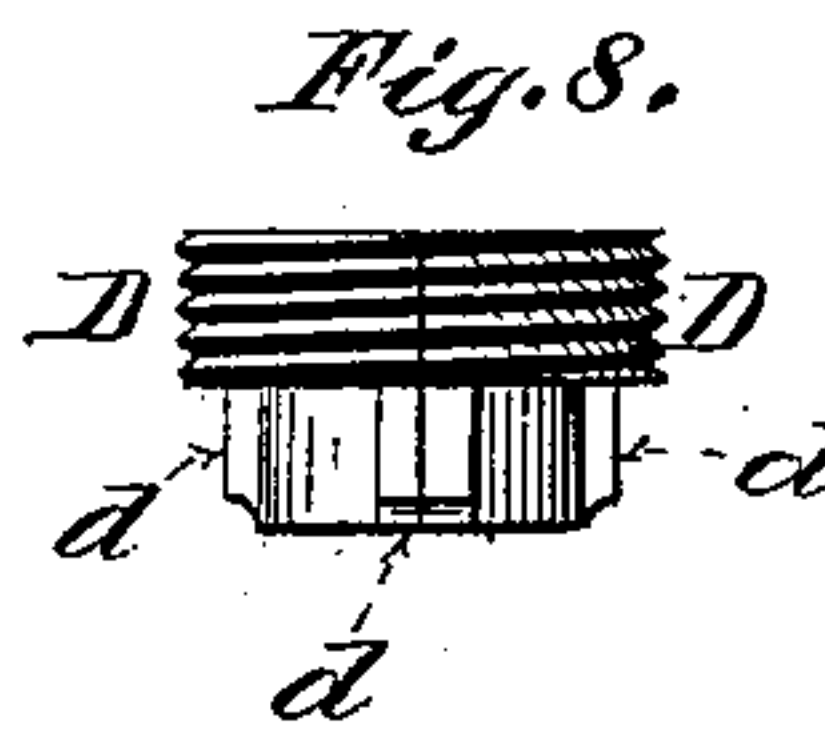
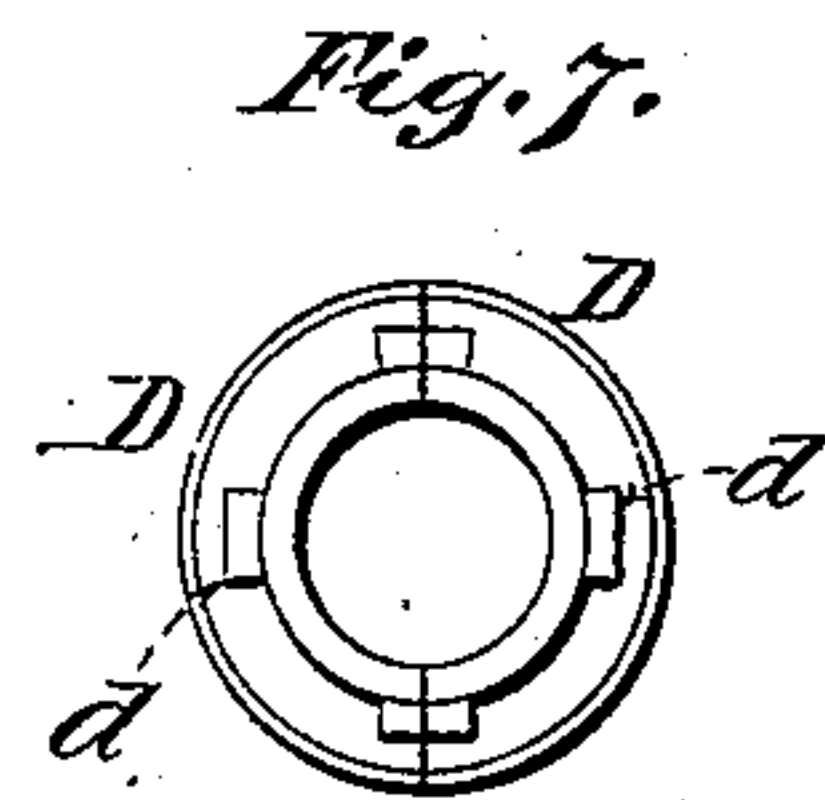
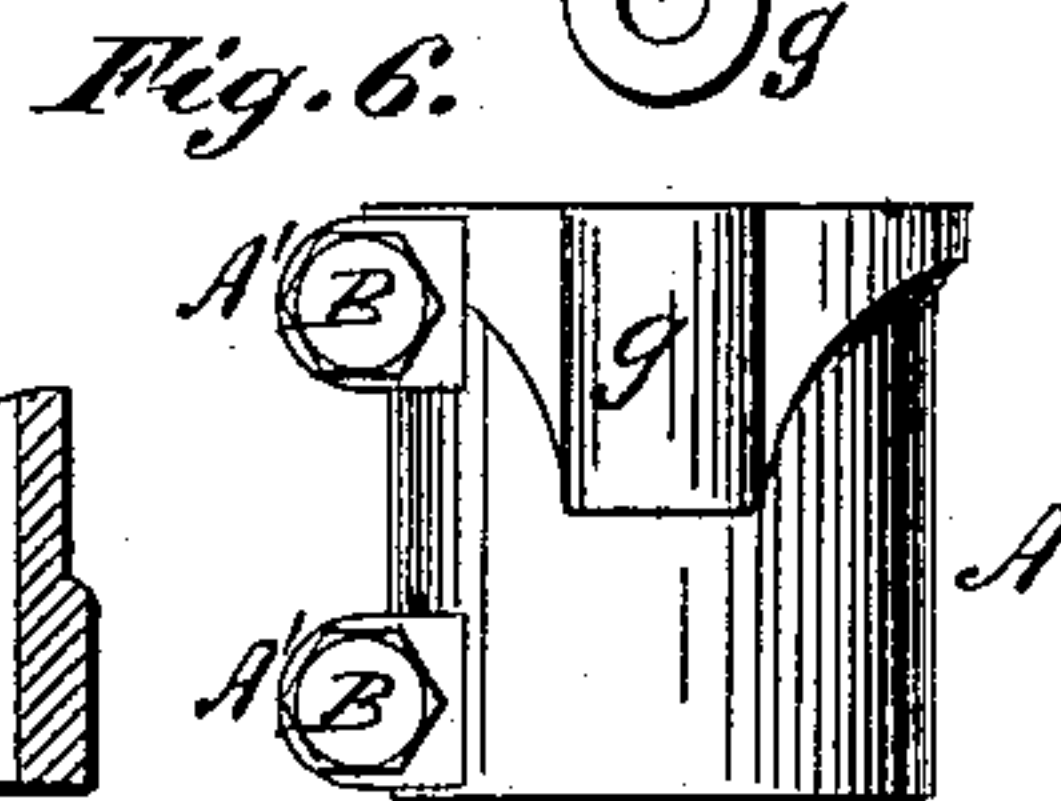
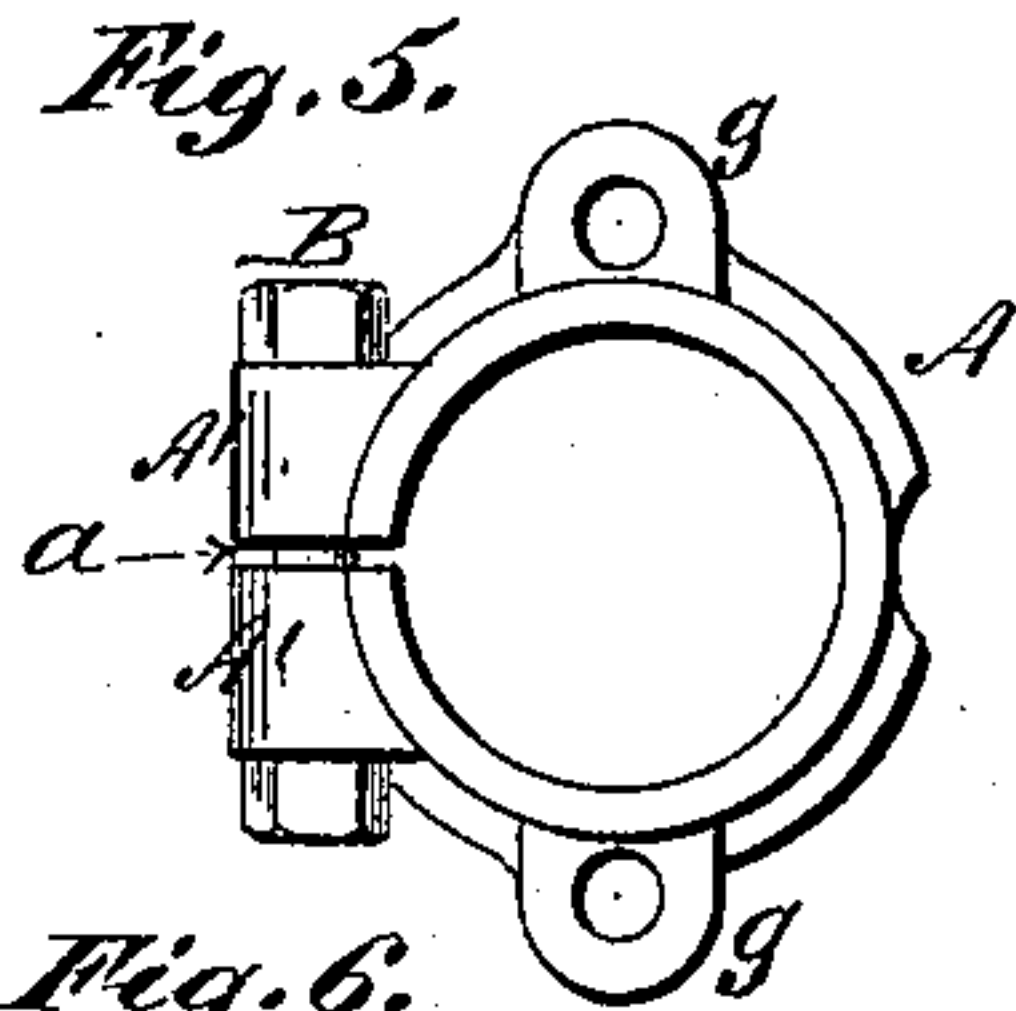
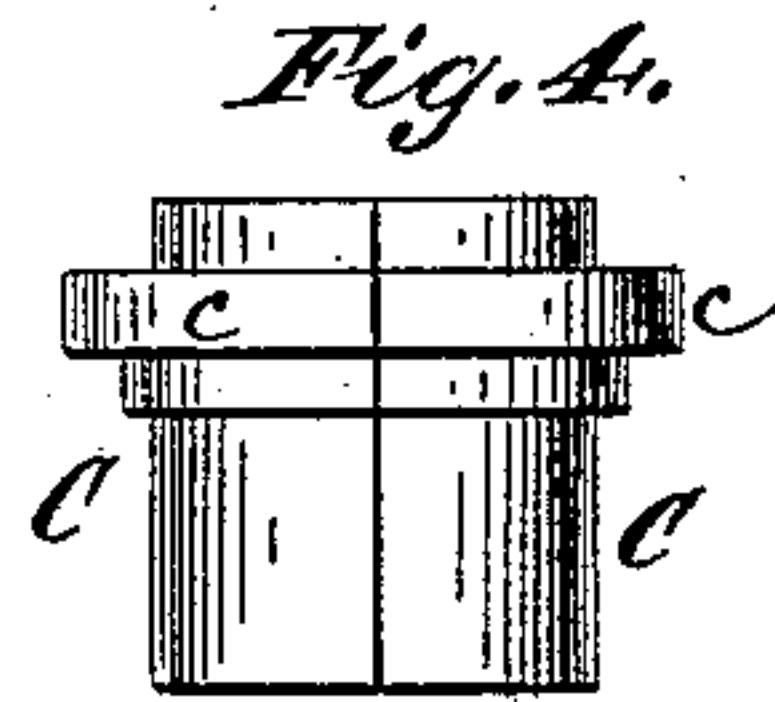
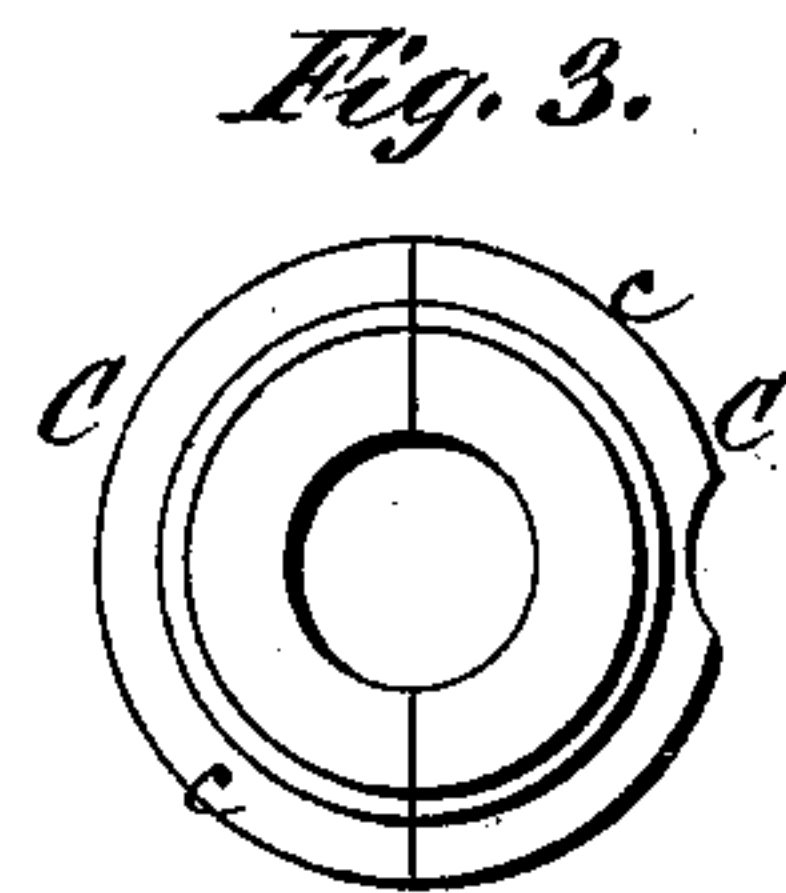
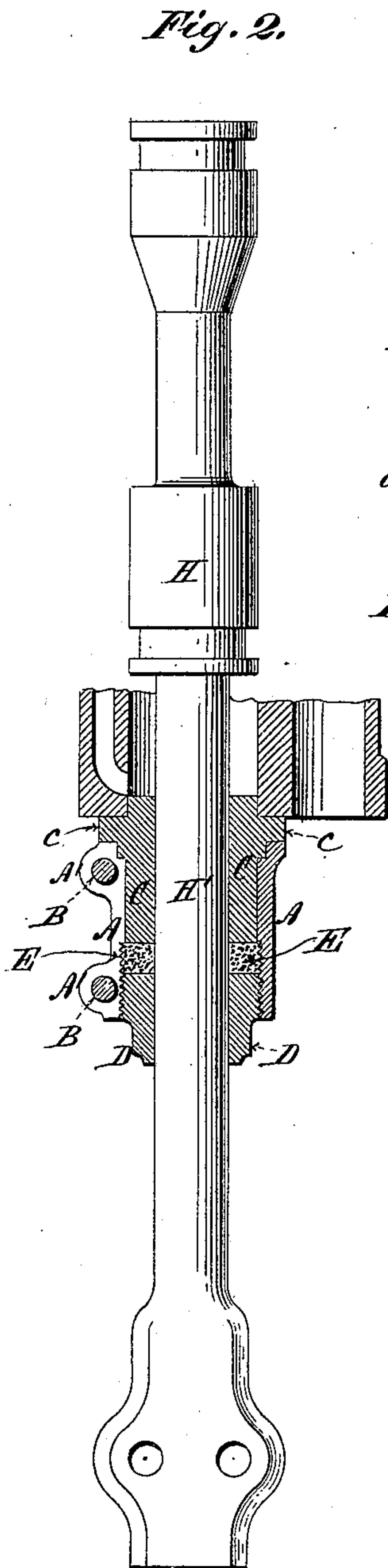
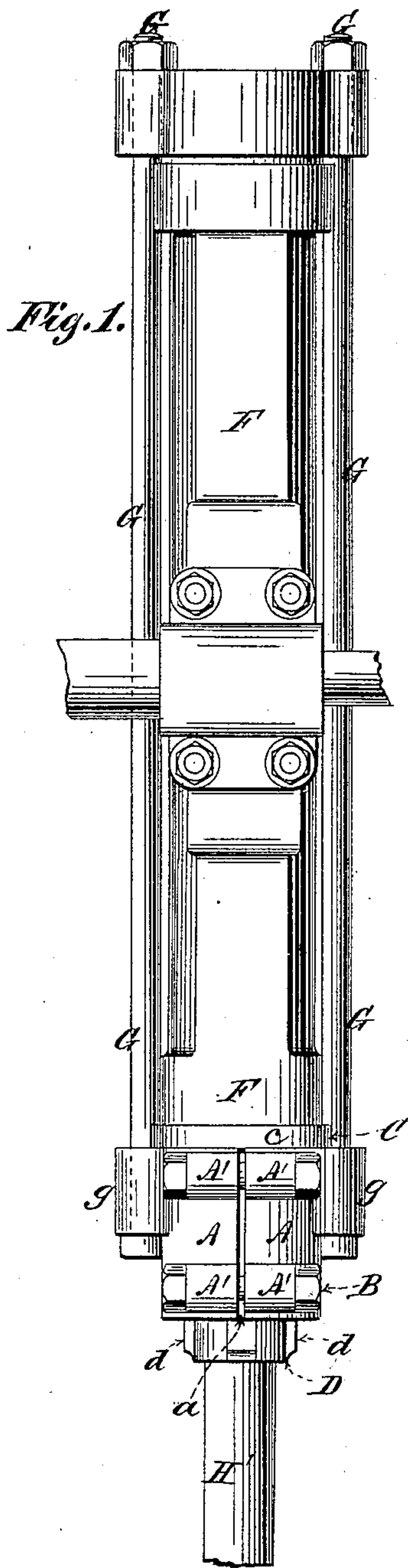
(No Model.)

J. C. GITHENS.

ROCK DRILL.

No. 356,464.

Patented Jan. 25, 1887.



Witnesses:  
Geo. W. Mott  
R. C. Howe.

Inventor:  
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# UNITED STATES PATENT OFFICE.

JOSEPH C. GITHENS, OF NORTH TARRYTOWN, NEW YORK.

## ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 356,464, dated January 25, 1887.

Application filed September 17, 1886. Serial No. 213,775. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH C. GITHENS, of North Tarrytown, New York, have invented certain Improvements in Rock-Drills, of which the following is a specification.

The object of this invention is to provide a steam rock-drill with a cylinder-head which will permit the use of a piston formed in one piece with the piston-rod and drill-chuck, and to so construct the cylinder-head that access to the bushings and packing which surround the piston-rod can be easily obtained for the purpose of renewing them when worn without removing the piston from the cylinder or otherwise deranging the parts of the drill, it being only necessary to loosen the bolts holding the cylinder-head and to draw it away from the cylinder.

My improvement consists in making what is usually called the "front cylinder-head" in the form of a sleeve which is longitudinally slit on one side, and which has an internal diameter sufficiently great to permit the piston to pass freely through it, and which is provided with clamping devices by means of which it is securely clamped upon a removable parting bushing, through which the piston-rod passes.

The accompanying drawings, illustrating my improvement, are as follows:

Figure 1 is an elevation of a rock-drill cylinder provided with my improved cylinder-head. Fig. 2 is a sectional view of the front cylinder-head and a portion of the cylinder, showing the piston and piston-rod in elevation. Figs. 3 and 4 are end and side elevations, respectively, illustrating the construction of the parting bushing. Figs. 5 and 6 are end and side elevations, respectively, of the slit sleeve; and Figs. 7 and 8 are end and side elevations, respectively, of the divided packing-gland.

As shown in the drawings, the front cylinder-head is composed of a cylindrical sleeve, A, which is slit open longitudinally at one side, and is provided with four perforated lugs, A', two on either side of the slit *a*, through which lugs are inserted the screw-bolts B B, which draw the edges of the slit sleeve A together and bind it firmly upon the parting

bushing C, which is inserted within the sleeve A.

The sleeve A is longer than that part of the bushing C which it incloses, and the portion which extends beyond the end of the bushing is provided with an internal screw-thread for engaging the screw-threads formed upon the exterior of the split packing-gland D, between which and the end of the bushing C is inserted packing material E. When the bolts B B are tightened, the split gland D is clamped within the sleeve A, and is prevented from being loosened by the vibration of the machine in use.

One end of the bushing C is turned to fit the interior of the steam-cylinder F, and the other end to fit the interior of the sleeve A, and is provided with a flange, *c*, near its cylinder end. One side of the flange bears against the end of the cylinder F, while the other bears upon the end of the sleeve A, and the flange is thus clamped between the ends of the cylinder F and the sleeve A, when the bolts G G, which pass through perforated lugs *g g* on the sleeve A, are tightened. The bolts G G pass through similar lugs formed on the rear cylinder-head, which is of the usual construction, and serve to secure both the front and rear heads to the cylinder.

In erecting the machine the piston H is passed through the sleeve A and inserted in the cylinder F. The halves of the parting bushing C are then placed together, encircling the piston-rod H', and the sleeve A slipped over their ends. The other end of the bushing C is then inserted in the end of the cylinder F, and the bolts G G put in place and screwed up. Then the packing material E is inserted in the annular space between the end of the sleeve A and piston-rod H', and the split gland D placed upon the piston-rod and screwed in upon the packing E. The bolts B B are then tightened and the cylinder-head is in place.

To renew the bushing C it is only necessary to loosen the bolts G G and B B and draw the sleeve A away from the cylinder F, when the halves of the bushing C may be easily drawn out and replaced by new ones.

The sleeve A is preferably made of malleable iron, and the parting bushing C and pack-

ing-gland D of cast-iron or other suitable material. The outer end of the gland D is provided with lugs *d d* to engage the notches of a spanner-wrench.

5 I claim as my invention—

In a rock-drill, the combination, substantially as herein set forth, with a steam-cylinder, piston, and piston-rod, of the longitudi-

nally-slitted sleeve A, the parting bushing C, the divided packing-gland D, and the bolts B B, 10 for clamping the sleeve upon the said bushing and gland.

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Witnesses:

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