(No Model.)

A. C. RAND.

ROCK DRILL.

No. 421,613. Patented Feb. 18, 1890.

Fig. 1.

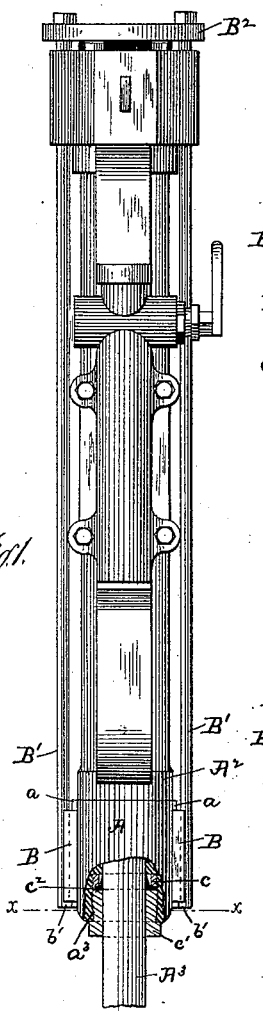


Fig. 5.

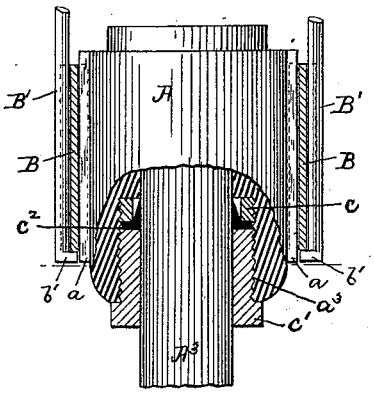


Fig. 3.

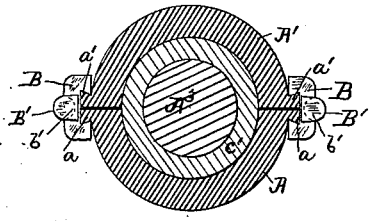


Fig. 4.

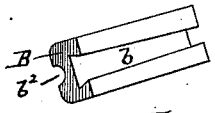


Fig. 2.

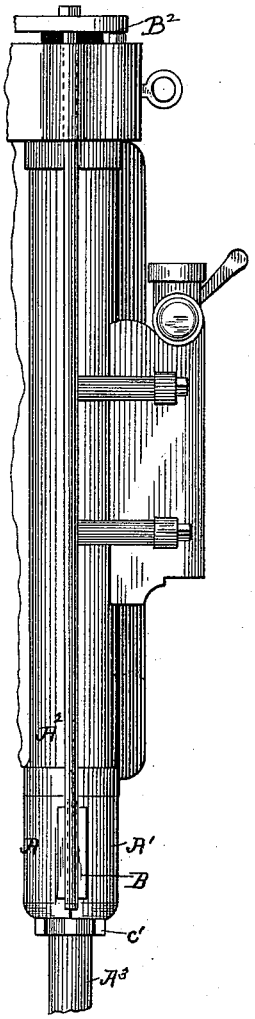
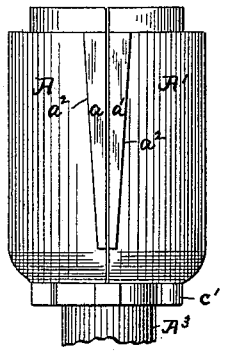


Fig. 6.



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ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 421,613, dated February 18, 1890.

Application filed June 2, 1888. Renewed July 24, 1889. Serial No. 318,549. (No model.)

To all whom it may concern:

Be it known that I, ADDISON C. RAND, of the city, county, and State of New York, have invented certain Improvements in Rock-Drills, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

My invention relates to a rock-drill; and it consists in the combination in and with the lower head of the cylinder thereof of the devices hereinafter particularly described and named, and as recited in the claims, arranged to operate as set forth.

Figure 1 is a vertical elevation, partly in longitudinal section, of a rock-drill, showing the devices constituting my invention. Fig. 2 is a vertical elevation of the same taken at right angles to the view shown in Fig. 1. Fig. 3 is an enlarged cross-section of the lower cylinder-head on line $x\,x$, Fig. 1. Fig. 4 is an under face view in perspective of the clamp-shoe hereinafter described. Fig. 5 is an enlarged view, partly in section, of the lower cylinder-head and its attached devices; and Fig. 6 is a side elevation, enlarged, of the sectional lower head.

The lower cylinder-head shown in the drawings is made or divided in longitudinal sections A A′, such form of said head being preferable and prevalent in rock-drills in which the tool-holding chuck carried by the piston-rod is formed integral with said piston-rod.

A^2 is the cylinder, and A^3 the piston-rod.

One feature of my invention consists in the devices I employ to separably unite the longitudinal sections of the divided lower head. Upon the outer edges of the meeting-faces of the sections A A′, and extending longitudinally thereof, I form the laterally-projecting flanges $a\,a'$, respectively, and said flanges on the respective sections are adapted to correspond to and coincide with each other at the section edges when the sections are united at their meeting-faces, as shown. The contiguous under faces of the respective pairs of flanges $a\,a'$ meet each other flatwise as substantial continuations of the meeting-faces of the sections, as shown. The opposite or upper faces of said flanges are inclined, as shown at a^2, so that each flange has a taper from the upper end of the head toward the lower end, and so that when the flanged sections are united the coinciding flanges thereof will constitute a wedge-like projection at the section edges with the toe or narrow end of the wedge toward the lower end of the head. The upper faces a^2 of the flanges are preferably given a downward inclination from the flange edge toward the body of each section, so as to form a dovetail, or its equivalent, of the coinciding flanges when they are united, as shown plainly in Fig. 3.

At B are shown clamp-shoes, each of which is formed or provided with a tapered and, preferably, dovetail channel b, extending longitudinally of the shoe from end to end, as shown plainly in Fig. 4, and adapted to fit upon the united wedge-like flanges $a\,a'$, as shown in Figs. 5 and 6. The shoes B thus serve as clamps to hold united the flanged sections of the lower head. The long bolts B′, extending from the yoke B^2 at the upper end of the drill and reaching longitudinally of the cylinder to the lower ends of the shoes, engage said shoes and serve to draw the shoes upward on the wedge-like flanges of the sections, and thus bind the sections tightly together. The bolts B′ may have the broad laterally-extended heads b', adapted to reach across the under faces or ends of the shoes, and the external face of each shoe may be channeled at b^2 to afford a seat or way for the bolts B′, passing longitudinally of the shoe, as shown. If desired, the shoes may be bored longitudinally and the bolts B′ may pass through the apertures thus formed, but I believe the arrangement represented in the drawings and above described to be preferable.

By means of the described devices the sections of the lower head may be effectively united to each other and held to the lower end of the cylinder, and may also be readily and expeditiously separated from each other and detached from the cylinder, while there is not that liability to fracture of the parts by the concussion and strain thereon when the drill is in operation, which is incurred when the sections of the head are conical, and are held together by a ring, also conical, fitted upon the exterior of the united section

and held by the long bolts B′, passed through lugs on said ring. When such ring is employed, the tendency of the strain thereon by the long bolts is to fracture the ring at its lower edge at a point or points on its circumference.

At *c*, Fig. 5, is shown a ring which is of an external diameter, adapting it to pass into and be seated at the bottom of the recess a^3 in the lower end of the cylinder-head, and which may be externally threaded to be screw-seated in said recess, which is threaded, as shown. The internal diameter of the ring is greater than the diameter of the piston-rod, so that an annular space will exist between the rod's surface and the internal face of the ring when the ring is seated.

At *c′* is shown a follower adapted to screw into the mouth of the recess a^3 around the piston-rod. When the lower cylinder-head is made in the described longitudinal sections, the follower is also usually divided into separable sections, so that it may be removed from the rod without displacing the piston or tool-chuck therefrom; but this feature of my invention is adapted for use not only in drills in which the lower head and the follower are thus each divided, but also in drills in which the said head and its follower are respectively in one piece.

The object of the ring *c* is to enable the use alternatively, at pleasure, of a leather packing-ring c^2, for the piston-rod, in the lower head or of the ordinary cotton-waste or equivalent packing. The leather packing-ring c^2 has its flange seated and held between the perimeter of the ring *c* and the end of the follower *c′*, its body lying against the piston-rod between the internal face of the ring and the rod-surface, as shown; or the ring being removed from the recess a^3, said recess may be filled with ordinary packing, and the follower *c′* then screwed into the opening to compress said packing to the rod in said recess. The necessity of forming a shoulder at the bottom of the recess within the cylinder-head to constitute a permanent seat for the leather packing-ring is thus avoided, and the permanency of such shoulder in the recess, necessitating the use only of a leather packing-ring, is thus obviated. By simply withdrawing the follower and removing the ring *c*, the recess a^3 may at any time be left free and open throughout for the use therein of ordinary packing.

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

1. In a rock-drill, the combination, with the separable longitudinal sections of the lower cylinder-head, of the tapered flanges *a* *a′*, extending longitudinally of the respective sections at their edges, together with the clamp-shoes B′, having tapered channels *b*, and the bolts B′ engaging said shoes, substantially as and for the purpose set forth.

2. In a rock-drill, the combination, with the lower cylinder-head having the recess or enlarged internal diameter a^3 at its lower end, and the follower *c′* adapted to fit and be seated in said recess, of the removable ring *c*, having an internal diameter greater than that of said follower and adapted to be seated in the bottom of said recess, and with the said follower to constitute a clamping-seat for the packing-ring c^2, substantially as and for the purpose set forth.

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