

(No Model.)

H. F. PARSONS.
ROCK DRILL.

No. 250,385.

Patented Dec. 6, 1881.

Fig. 1.

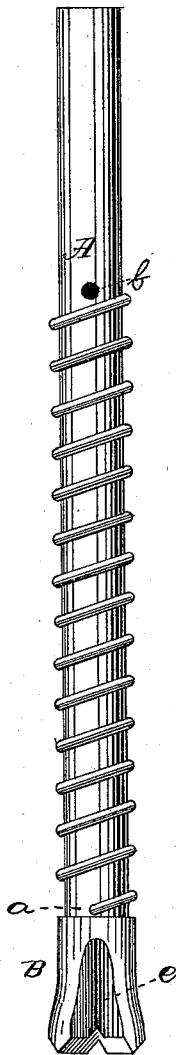


Fig. 2.

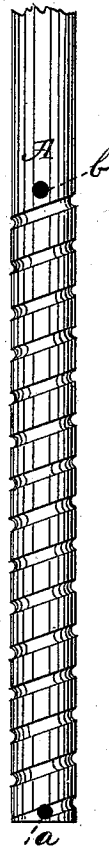


Fig. 3.

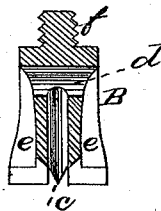
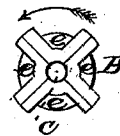


Fig. 4.



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ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 250,385, dated December 6, 1881.

Application filed September 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. PARSONS, of the city and county of San Francisco, in the State of California, have invented a new and
5 useful Improvement in Rock-Drills, of which the following is a description.

My improvement relates particularly to that class of rock-drills which are used with drill-
10 ing-machines operated by power or hand.

It consists in providing the drill-rod with a projecting rib wound spirally around it from the cutter of the drill upward. By this construction I am enabled to facilitate the upward discharge of the cuttings by producing on the
15 drill-rod a spiral of a less pitch than it was practicable to produce by the use of the twisted drills which had been used heretofore.

My improvement further consists in constructing a drill in two parts, one being the
20 rod around which the projecting rib is wound spirally, and the other being a cutting-head which is screwed or otherwise attached on the end of the rod directly below the lower end of the spiral rib.

My improvement further consists in providing this cutting-head with a hole which extends upward through the center of the cutting-head and intersects another hole which extends transversely through the cutting-head
30 near its top, so that a portion of the cuttings may find their way up through the central hole, and thus into the intersecting hole, and out of each end of said intersecting hole, and thence upward, so as to be caught and lifted
35 by the spiral rib.

In the drawings, Figure 1 represents a side view of my improved drill. Fig. 2 represents a side view of the drill-rod with the cutting-head and spiral rib removed. Fig. 3 represents a longitudinal section of the cutting-head through its axis. Fig. 4 represents a
40 lower end view of the cutting-head.

A is the drill-rod, which is preferably round and of steel or any other suitable material, and which is provided at its lower end with
45 means of attachment to the cutting-head B, which means of attachment is represented in the drawings as a screw.

The projecting rib, which is preferably of
50 wire, may be secured to the drill-rod in the following manner:

The drill-rod is provided with a slight spiral groove of the pitch which it is desired to give the spiral wire. This groove begins at a hole through the drill-rod situated at the lower
55 portion thereof, as at *a*, and extends upward to the hole *b*, situated near the upper portion of the drill-rod. One end of the wire is inserted in the hole *a*, and the wire is wound spirally around the drill-rod in the grooves
60 heretofore referred to until the hole *b* is reached, into which the upper end of the wire is inserted. The position of the wire is thus insured; but other means of securing the spiral rib in position might be employed.

The cutting-head is constructed of steel or other suitable material. The cutting-edges of the cutting-head B run nearly to the center, as shown in Fig. 4, and from these cutting-edges the cutting-head extends upward and
70 slightly contracts in its diameter until a sufficient height is reached—say two inches—when the cutting-head is provided with a means of attachment to the drill-rod A, which means is preferably a screw, *f*, as shown in the draw-
75 ings. At the point where the cutting-edges meet begins a hole, *c*, which extends upward in the center of the cutting-head until it intersects with the hole *d*, extending through the cutting-head near its top and open at both
80 ends. Vertical grooves *e e e e* are formed in the sides of the cutting-head, between the cutting-edges.

In operation the cuttings or drillings which are produced by the cutting-edges of the drill
85 will accumulate in the spaces *e e e e* until they have accumulated there to such an extent as to extend upward to the lower portion of the spiral wire around the drill-rod, which, in consequence of the rotary motion of the drill-rod
90 in the direction of the arrow, Fig. 4, which is necessary for operating the drill, takes under the waste drillings and causes them to advance up around the drill-rod on the spiral wire until they are discharged at the top of the drill-hole.
95 Other cuttings or drillings also pass up through the center opening, *c*, and are discharged out at each side through the opening *d*, where they join the cuttings or drillings passing through the grooves *e e*, heretofore referred to, and are
100 also carried upward on the spiral wire on the drill-rod.

I am aware that drills have been constructed heretofore which contained a spiral groove extending upward on the drill-rod, for causing the discharge of the cuttings, which spiral groove is produced by twisting the drill; but such groove is necessarily of too great a pitch to be of much use for discharging the drillings. By the use of the wire described herein a spiral is produced around the rod of much less pitch than was heretofore practicable, and thus I am able to greatly facilitate the discharge of the drillings. On a drill-rod three-quarters of an inch in diameter I prefer to give the spiral rib about one-half inch pitch.

As stated above, I prefer to have a cutting-head detachable from the drill-rod, because it is obvious that by so doing I am enabled to produce an economy in the apparatus used, for as soon as one cutting-head becomes dull or worn, or unfit for use, I can remove it and substitute therefor another cutting-head, and thus one drill-rod will be made to answer the purpose for an indefinite period without reference to the wear of the drill, which would not be the case if the drill-rod and cutting-head were all in one piece, because as soon as the cutter became too much worn for use the drill-rod would have to be thrown away and wasted.

The arrangement of holes or internal passages here described in the cutting-head enables the cuttings or drillings to pass upward through the center as well as on the outside of the cutting-head, and the combination of these holes with the spiral enables the spiral to lift the cuttings which are passed up from the center of the cutting-head as well as from the outside.

It will sometimes be found desirable to slightly incline the cross hole or passage *d* upward from the place where it intersects the hole *c* toward its two ends to facilitate the discharge of the drillings through it.

It is obvious that in the construction which I have shown the spiral may be readily removed or replaced, if desired, and that should the ends of the rib break at *a*, the shoulder formed by the head would support the spiral rib and prevent it coming off.

I claim—

1. The combination, with a drill-rod, of a separate spiral rib to carry up the borings, substantially as described.

2. The combination, with a drill-rod, of a spiral rib constructed to be removably attached thereto and to lift the borings upward as the drill revolves, substantially as described.

3. The combination, with the spiral rib, of a drill-rod provided with a groove to support the rib, substantially as described.

4. The drill-rod *A*, in combination with a removable rib and a cutting-head, *B*, whereby the rib may be securely held in position, substantially as described.

5. The drill-head *B*, provided with the exterior groove or grooves, *e*, central passage, *c*, extending down to the cutting-edge, and the transverse passage *d*, substantially as and for the purpose specified.

6. The combination of the interior passages, *c* and *d*, with the spiral on the drill-rod, substantially as described.

7. The combination of the exterior groove or grooves, *e*, with the spiral on the drill-rod, substantially as described.

8. The combination of the rod *A*, having a spiral groove, and the spiral rib, with the removable head *B*, provided with a shoulder to hold the rib on the rod, substantially as described.

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