(No Model.)

L. D. CONNER & C. F. PEEBLES.

CORE ROCK DRILL.

No. 312,093. Patented Feb. 10, 1885.

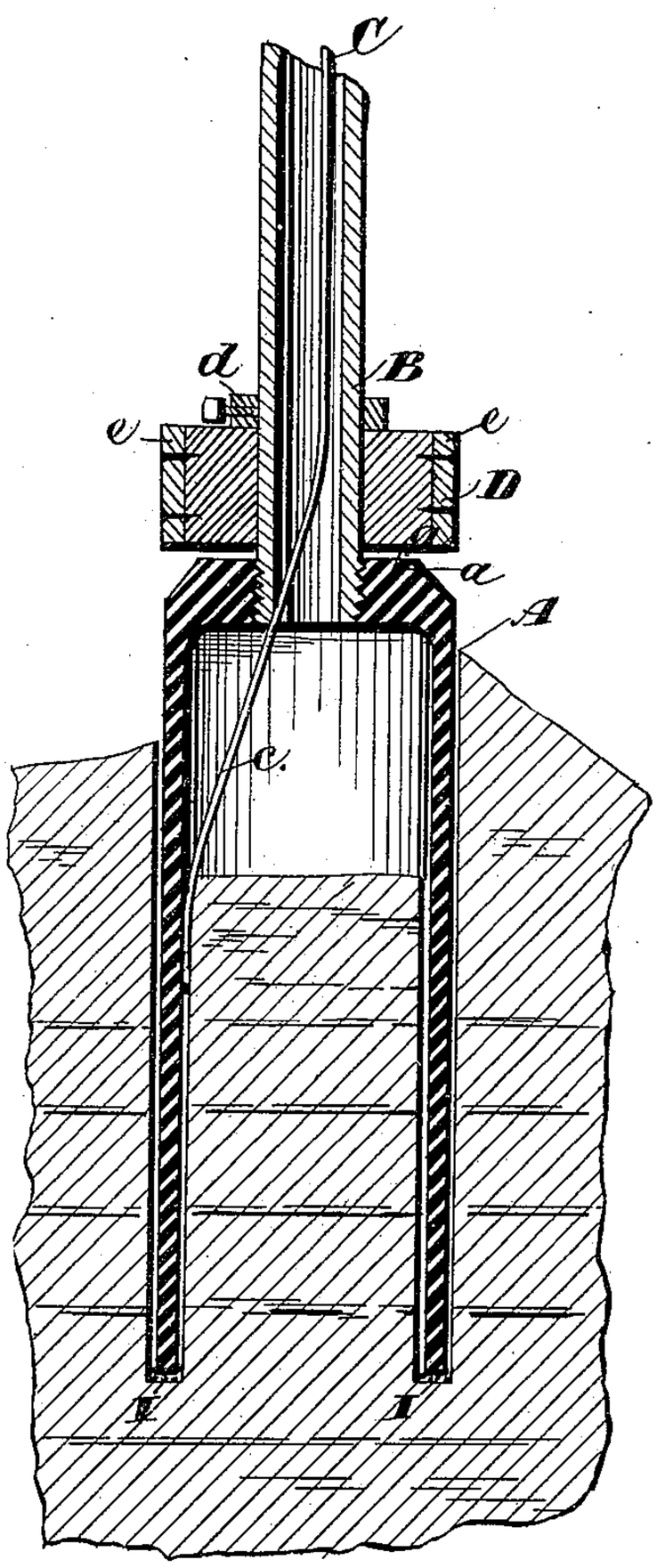

FIG. 1.

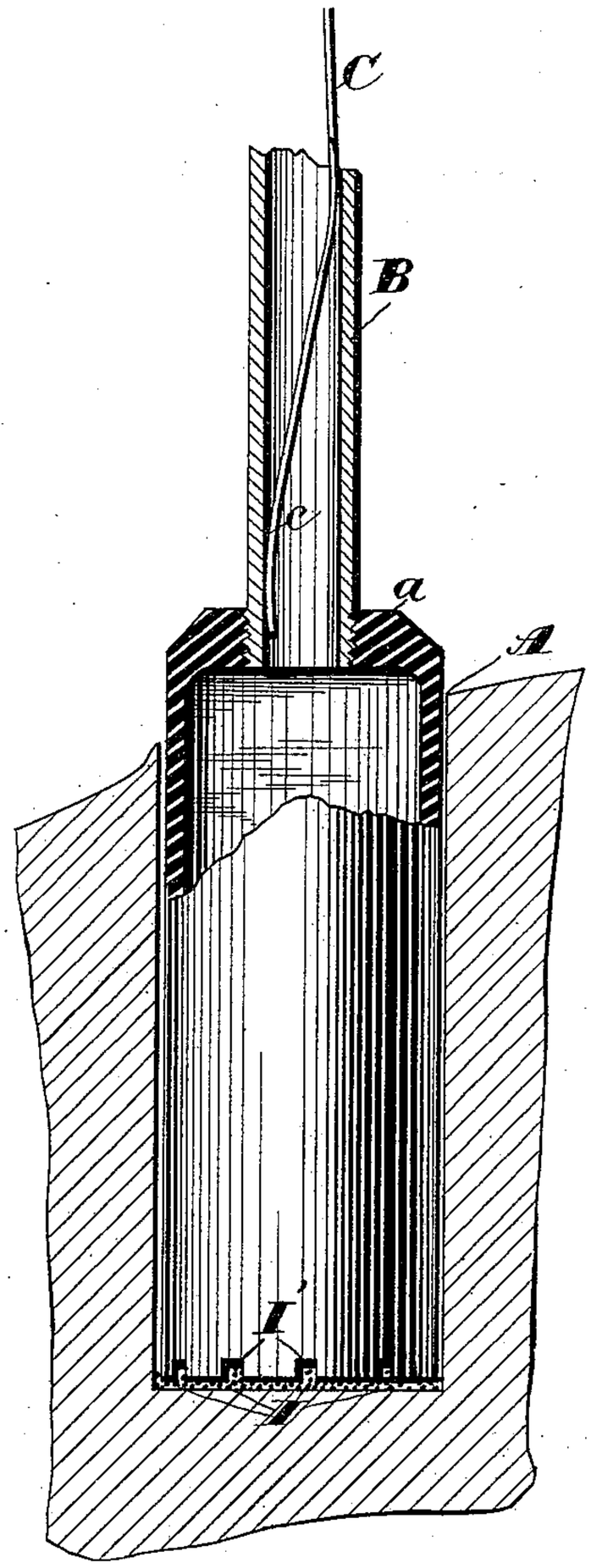

FIG. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

LEWIS D. CONNER, OF OBERLIN, AND CHARLES F. PEEBLES, OF BEREA, OHIO.

CORE ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 312,093, dated February 10, 1885.

Application filed August 26, 1884. (No model.)

To all whom it may concern:

Be it known that we, LEWIS D. CONNER and CHARLES F. PEEBLES, respectively of Oberlin, in the county of Lorain and State of Ohio, and of Berea, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Core Rock-Drills; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

Our invention relates to improvements in core rock-drills and to a process for operating the same, the object being to provide a core rock-drill at a less initial cost than devices of this kind heretofore in use.

Our invention also relates to a process of drilling rock by friction caused by rotating the drill with sand, chilled-iron globules, or other hard material of small size intermediate between the core-drill and the rock, in combination with water or other fluid to soften the rock and absorb the cuttings from the rock.

With these objects in view our invention consists in certain features of construction, and in combination of parts, and in a process, that are hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation in section of our improved core-drill in position in the rock. Fig. 2 is an elevation, partly in section, of the same.

The drill proper consists of a metal tube, A, preferably of the ordinary wrought-iron tubing, and of such size as may be required, according to the size of the hole to be drilled in the rock. The part A is usually some five or six feet, more or less, in length, and has a head, *a*, formed, preferably, by closing or swaging the end of the tube; but if the tube A is quite large, a separate piece may be had inside of the tube to form the part *a*. A smaller tube, B, usually about one and a half or two inches in diameter inside, is secured to the head *a*, and forms the shank or spindle by which the drill is rotated. The mechanism for rotating and elevating the drill is of the ordinary construction, and is so well known that it is not considered necessary to describe it. Small chilled-iron globules, sand, or other hard material of small size are from time to time placed in the hole, and the rock is cut away by the friction of such material caused by the rotation of the drill. The action is similar to that had in the well-known process of sawing stone. The chilled-iron globules are preferable, for the reason that they cut the stone very fast, and are comparatively inexpensive, in view of the fact that there is no waste of material, as the globules are confined in the bottom of the hole, as shown at I. The tube B is extended from time to time by attaching additional lengths of tubing in the usual manner. This tube usually extends some ten or fifteen feet, more or less, above the ground, and a stream of water is constantly kept flowing into it, which, passing down under the drill, absorbs the cuttings from the rock, that of course are fine dust. By this means the drill is released from the cuttings that are carried up with the water and overflow at the top of the ground. One or more slots, I′, should be made in the end of the drill in order that the water may have free passage from the inside to the outside of the drill. Wooden guide-blocks D are from time to time placed upon the tube B, and are held down by a collar and set-screw, *d*. As the hole is always full of water, the blocks D are buoyed up thereby, so that no collar is required under the guide-blocks. These blocks should fit easily on the tube and form journal-boxes for the same, but should not fit the hole in the rock so closely as to prevent the free passage of water. We prefer square blocks for these guides of such size that strips of rubber *e* may be nailed to the corners of the blocks to make these corners fit the holes in the rock. Such blocks leave a free passage-way for the water, and are easily forced along the bore in the rock to the position required. One of these guide-blocks should be near the upper end of the drill, and others should be attached around the tube, say twelve to fifteen feet, more or less, apart, according to the circumstances, of which the operator will be the best judge. A small tube or rod, C, extends through the tube B, and has a long, narrow, thin, elastic blade bent or curved longitudinally, so that it has to be sprung back or partially straightened when it is placed in the tube B. Of course, this tube is lengthened from time to time by additional lengths. Af-

ter the drill has cut into the rock for some distance a core, D, is left inside the drill, and must be removed. The rod C is thrust down, and as the end of the blade *c* passes into the tube A the recoil of the blade carries the point thereof to one side and enters between the side of the tube A and the core D. There are usually more or less seams in the rock, so that the core is readily broken, when the blade *c* is wedged in on one side of the core, and at the same time the portion of the core that is broken off is held sufficiently firm in the tube A by means of the wedge to be lifted out with the drill. In commencing the work, if the rock extends to the surface, a shallow annular groove is usually first cut in the rock to form a seat for the drill and to hold the said globules, sand, or other material used. This drill and process are well adapted to "channeling" rock in quarrying stone, and for this purpose the drills may be used in gangs of any desired number, and the cores, if of large size, are available for columns, and the smaller sizes are useful for ornaments and various purposes.

The small initial cost of the drill and the cheapness of the process render the device available to farmers or others who cannot afford the more expensive devices heretofore in use.

What we claim is—

1. A core-drill consisting, essentially, of a metal tube or drill proper, secured to a smaller tube, which serves as a water-supply pipe and a spindle, and adjustable guide-blocks secured to said spindle, substantially as set forth.

2. The combination, with the tube A, provided with the head *a* and one or more slots or openings, I′, and secured to the tube B, of the rod or tube C, provided with the elastic blade *c*, bent and operated in the manner shown, substantially as set forth.

3. The combination, with a core-drill and a hollow spindle secured to one end of the core-drill, of the wooden guide-blocks and the collars adjustably secured to the spindle, substantially as set forth.

In testimony whereof we sign this specification, in the presence of two witnesses, this 18th day of August, 1884.

LEWIS D. CONNER.
CHARLES F. PEEBLES.

Witnesses:
D. C. WISNER,
EDWD. ROBINSON.