(No Model.)

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CORE DRILL.

No. 387,680. Patented Aug. 14, 1888.

Fig. 1.

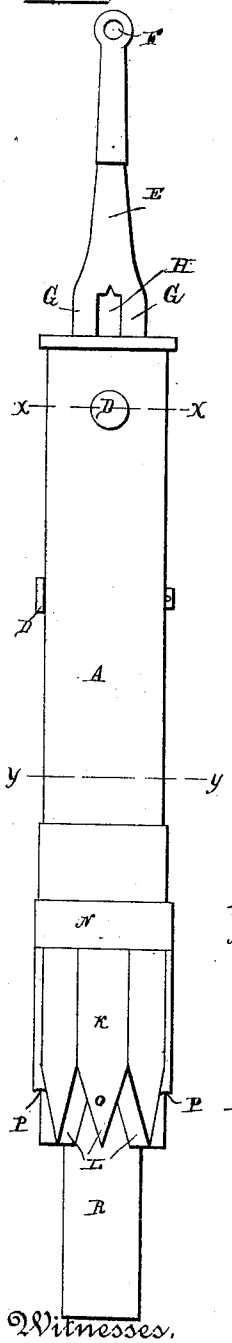


Fig. 2.

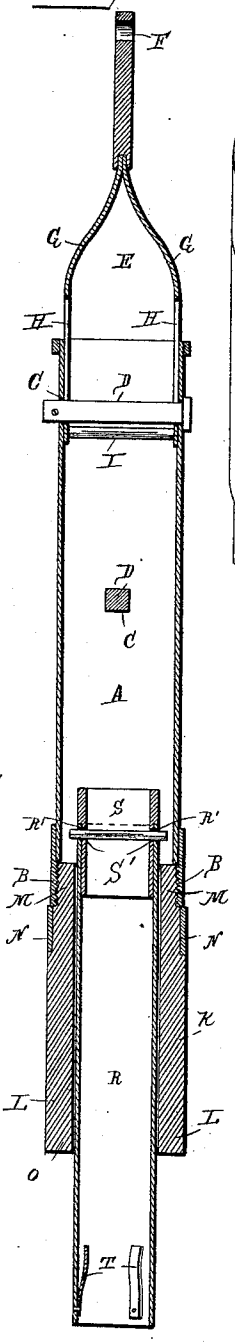


Fig. 3.

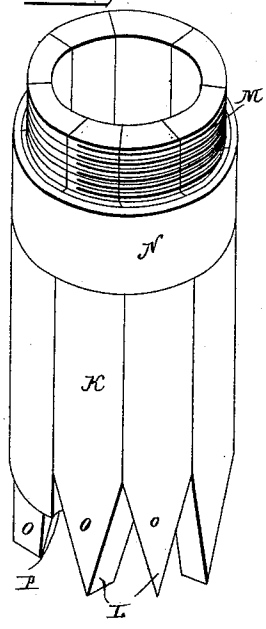


Fig. 4.

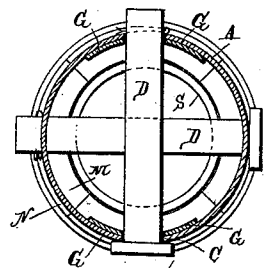


Fig. 5.

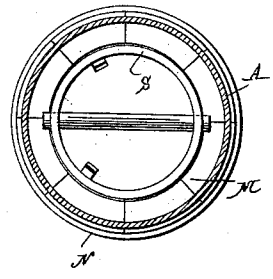
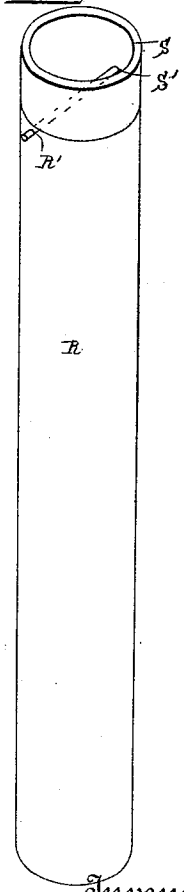


Fig. 6.



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CORE-DRILL.

SPECIFICATION forming part of Letters Patent No. 387,680, dated August 14, 1888.

Application filed February 21, 1888. Serial No. 264,707. (No model.)

To all whom it may concern:

Be it known that we, JOHN F. GOURLEY, THOMAS G. WINEY, and JOHN F. HERTZLER, citizens of the United States, residing at Lawrence, in the county of Douglas and State of Kansas, have invented a new and useful Improvement in Core-Drills, of which the following is a specification.

Our invention relates to an improvement in core-drills, adapted especially for use in prospecting for coal and ores; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a core-drill embodying our improvements. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a detached perspective view of the drill point or head. Fig. 4 is a horizontal transverse sectional view taken on the line *x x* of Fig. 1. Fig. 5 is a similar view taken on the line *y y* of Fig. 1. Fig. 6 is a detached perspective view of the core-sleeve used for prospecting for mineral ores.

A represents a cylindrical tube of suitable length and diameter, which is provided at its lower end with internal screw-threads, B. At suitable distances from the upper end of the said tube are aligned openings C, through which pins D are inserted at right angles to each other.

E represents a yoke, which is adapted to be connected to the lower end of the rod for lowering the drill and rotating the same, and is provided at its upper end with an eye, F, by means of which it is attached to said rod. The latter, being well understood by persons well skilled in this art, is not shown in the accompanying drawings, nor described in this application. The yoke E is further provided with a pair of downwardly-extending bifurcated arms, G, which fit in the upper end of the tube A and are provided with vertical slots H, through which the upper transverse pin D extends, so as to secure the yoke to the tube A and at the same time permit the said yoke to reciprocate vertically a suitable distance in the upper end of the said tube. The lower ends of the arms G of the yoke are connected by a cross-bar, I.

K represents the drill point or head, which comprises a series of separable cutters, L, which are arranged to form a hollow cylinder, as shown, and have their upper ends reduced and threaded on their outer sides to provide a threaded projection, M, which is adapted to be screwed into the lower end of the tube A. The said cutters L are secured together by means of an annular band or ring, N, which is forced over their reduced upper end. There are eight in all of these cutters employed, six of which—three on each side of the head—have their lower ends beveled on opposite sides to a point at O, and two of which—on diametrically-opposite sides between the two sets or series of cutters having said points O—have their lower ends truncated and provided with concaves P. The cutters having the points O cut or abrade the vein of ore or coal when the drill is rotated therein, and the truncated cutters P prevent the drill from becoming choked in the bore.

R represents a cylindrical hollow tube, which is the core lifter and receiver, and passes through and is fitted in the vertical cylindrical bore of the drill-head K. In the upper end of said tube or core-lifter is fitted a cylindrical sleeve, S, which is removable therefrom and has openings S′ in opposite sides, which are adapted to register with openings R′ in the upper end of the core-lifter or tube. At the lower end of the core lifter, on the inner side thereof, are a number of springs or catches, T, the lower ends of which are rigidly secured to the core-lifter, and the upper ends of which are free and normally project inward toward the center of the core-lifter.

In order to secure the core-lifter after the same is passed upward in the bore of the drill-head, the lower pin D is withdrawn from the openings in the tube A, the openings in the upper end of the core-lifter and its sleeve are secured to register with said openings in tube A, and a pin, U, is inserted in the opening of the core-lifter and its sleeve. The ends of said pin project beyond opposite sides of the core-lifter and engage the upper edge of the drill-head, thereby preventing the core-lifter from dropping from the drill-head. The lower pin D is then replaced in the openings in tube A. By this same means the core-lifter may be de-

tached from the drill without unscrewing the drill-head from the tube A, as will be readily understood.

The operation of our invention is as follows: When the drill is lowered in the bore, the core-lifter is driven upward therein by contact with the bottom of the bore until its upper end engages the lower transverse pin D. The rotation of the drill—imparted in the common well-known manner—causes the drill-head as it descends to cut out a core, which moves upward in the core-lifter R, and is retained therein by the springs T. From time to time the drill is raised from the bore, the core-lifter removed and emptied of its contents.

It will be readily understood from the foregoing description that a drill thus constructed and adapted to retain the core as a specimen of the vein of ore or coal through which it works enables prospectors to ascertain definitely the character of the mine and the thickness and quality of the vein therein.

The core-lifter shown in detail in Fig. 6 is precisely similar to the core-lifter R, with the exception that it is provided at its lower end on diametrically-opposite sides with vertical open slots *a*, which facilitate the operation of the core-lifter in passing through a vein of mineral ores.

Having thus described our invention, we claim—

1. The combination, in a core-drill, of the tube A, having the hollow cylindrical drill-head at its lower end, and the tubular core-lifter R, vertically movable in the tube and in the drill-head extending through the bore of the latter, and having the retaining devices T at its lower end, substantially as described.

2. In a core-drill, the drill-head K, comprising the series of segmental separable cutters arranged in contact with each other to form a hollow cylinder, and having the lower cutting-edges, substantially as described.

3. The cutter-head for core-drills, comprising the series of segmental separable cutters L, arranged in contact with each other to form a hollow cylinder, in combination with the annular band or ring N, securing the said cutters together, substantially as described.

4. The combination, in a core-drill, of the tube A, the hollow cylindrical cutter-head K, secured to the lower end of tube A, and removable therefrom, and the tubular vertically-movable core-lifter R, arranged in the lower portion of tube A and extending through the bore of the drill-head, substantially as described.

5. The combination, in a core-drill, of the tube A, having the hollow cylindrical drill-head at its lower end, the vertically-movable core-lifter R, arranged in the lower portion of the tube and extending through the bore of the drill-head, and the yoke E, attached to the upper end of tube A and vertically movable therein, substantially as described.

6. The combination, in a core drill, of the tube A, having the hollow cylindrical drill-head at its lower end, the yoke E, having the slotted arm arranged in the upper end of the tube, and the pin D, extending transversely through the latter and through the slot in the yoke-arms, substantially as described.

7. The combination, in a drill-head for core-drills, of the segmental cutters L, arranged in contact with each other to form the hollow cylinder, some of the said cutters having the point beveled on opposite sides at O, and the remaining cutters on diametrically-opposite sides of the head having their lower ends truncated and provided with the concaves P, substantially as described.

8. The combination, in a core drill, of the tube A, having the hollow cylindrical drill-head at its lower end and the vertically-movable core-lifter R, arranged in the lower end of the tube and extending through the bore of the drill-head, said core-lifter having the retaining-springs T on its inner side at its lower end, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

JOHN F. GOURLEY.
THOMAS G. WINEY.
JOHN F. HERTZLER.

Witnesses:
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A. J. MARTIN.