

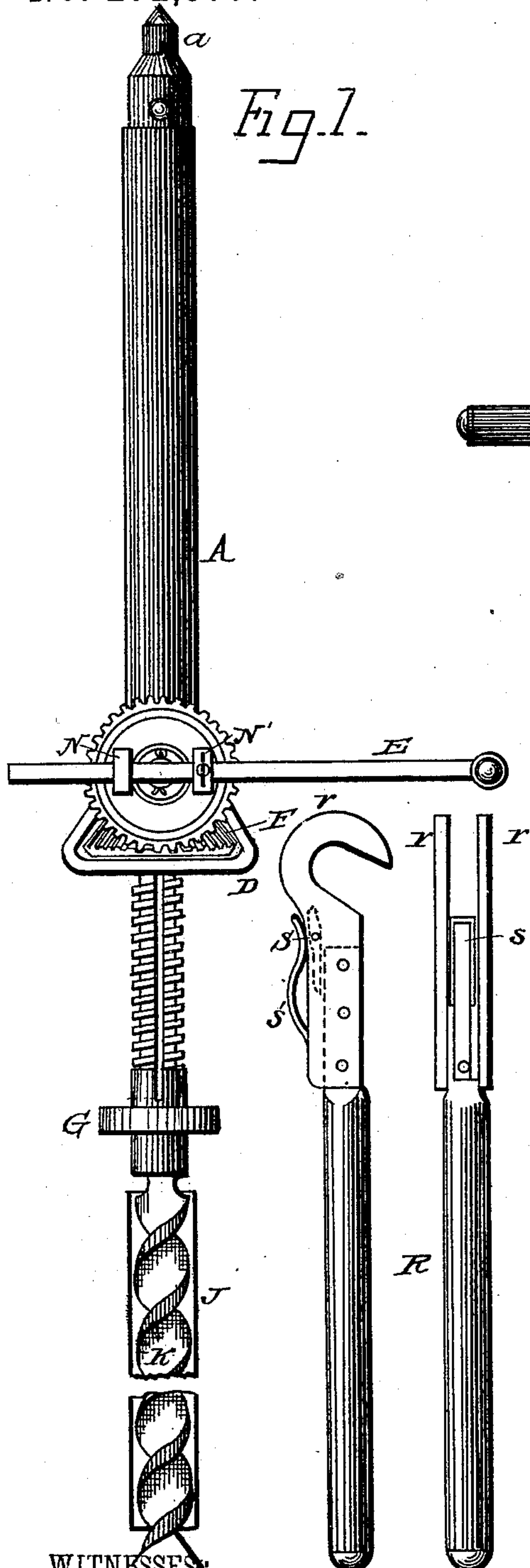
(No Model.)

T. RADFORD.

ROCK DRILL.

No. 272,977.

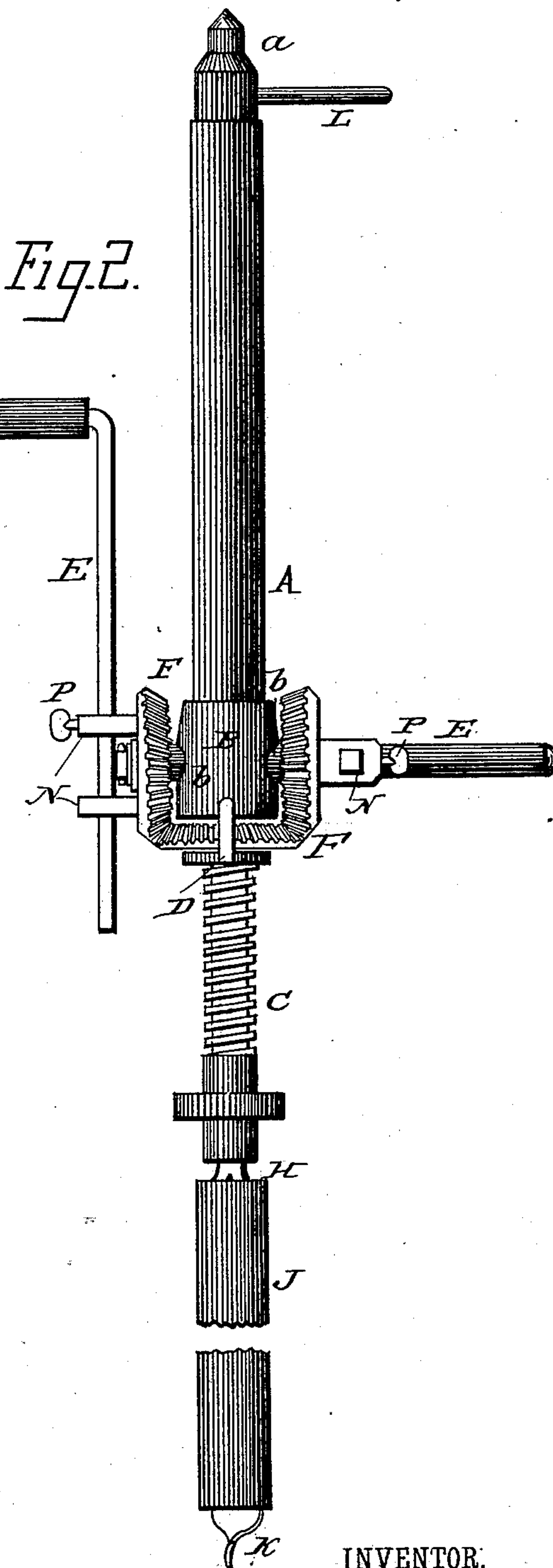
Patented Feb. 27, 1883.



WITNESSES:

Fred. S. Dietrich
J. G. Hinkel

Fig. 3



INVENTOR,

Thomas Radford

by *De Witt C. Allen*
ATTORNEY

UNITED STATES PATENT OFFICE.

THOMAS RADFORD, OF BLOOMINGTON, ILLINOIS, ASSIGNOR OF FOUR-FIFTHS
TO JAMES B. STEVENSON, WILLIAM STEVENSON, MATTHEW T. SCOTT,
AND WILLIAM RADFORD, ALL OF SAME PLACE.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 272,977, dated February 27, 1883.

Application filed October 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS RADFORD, of the city of Bloomington, in the county of McLean, and in the State of Illinois, have invented certain new and useful Improvements in Miter-Gear and Ratchet-Drills for Drilling Rock and Coal; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 represents a side elevation of my improved rock and coal drilling machine; Fig. 2, a front view of the same; Fig. 3, side and back views of ratchet-lever.

The object of my invention is to increase the efficiency and operation of machines employed for drilling rock, coal, &c.; and it consists in novel features of construction, combination, and arrangement of parts, all as will be hereinafter fully described, and set forth in the claims hereto annexed.

In the annexed drawings, A represents a metallic tube or pipe, having at one end a tapering steel point, *a*, to be applied to a post or other suitable abutment when operating the drill, and at its other end with an interior screw-thread for the reception of the screw-rod C, which is provided at its lower end with a square socket, H, for the reception of the square shank of the drill K.

B represents a metallic tubular frame, detachably secured in any suitable manner over or to the lower end of the tube or pipe A, and provided on opposite sides with stub-axes *b b*, upon which are loosely mounted the bevel or miter gear wheels F F, which mesh with a bevel or miter gear wheel, F', arranged in the guard D of the frame B for keeping it in place, and mounted on and keyed to the screw-rod C by a key dovetailed in the hub of said wheel, and which fits in the groove *c*, running the entire length of the screw-rod.

N represents metallic projections on the outer sides of the gear-wheels F F, having openings through them for the reception of the handles E E, which can be adjusted therein to lengthen or shorten them, and secured in any

desired position by the set-screws P for increasing or decreasing the leverage of the handles.

By the above arrangement one or two persons can be employed for operating the drill, the wheels F being turned by the handles E, and thus communicating a revolving motion to the wheel F' and the screw-rod to which the wheel F' is keyed.

Upon the lower end of the screw-rod C is securely mounted a ratchet-wheel, G, which is operated by a detachable hand-lever, R, having hooked bars *rr*, connected to the opposite sides of the lever, and an intermediate pivoted pawl, S, and spring S'. In operating the ratchet-wheel by said lever R the hooked ends *rr* are placed over the socketed end of the screw-rod C and on opposite sides of the ratchet-wheel, (to form a firm and steady fulcrum for said lever,) so that the pawl S will engage the teeth thereof when it is operated in a similar manner to all ratchet-drills.

When the ratchet mechanism is used for operating the drill the gearing mechanism may be removed by merely removing the screw-rod C and slipping the frame off from the tube or pipe A, and then replacing the screw-rod.

The ratchet mechanism, although working slower than the gearing mechanism, can be used where it is desired to run straight along the side of and within one inch of a wall, which makes it very advantageous for drilling headings, where the gearing mechanism could not be used.

In drilling perpendicular holes great difficulty and trouble are experienced in removing the dirt and borings; and to obviate this defect I employed an open-ended detachable tube or jacket, J, which fits over the drill, as shown in Figs. 1 and 2. The bit or point of the drill is made large enough, or the tube or jacket made smaller in diameter than the enlarged end of the drill-bit or point, to prevent the tube or jacket from coming off, and to cut away the ground or other material to make room for it, and when the same is full the drill is removed from the screw-rod and the tube or jacket taken off over the shank end of drill and the dirt or borings removed therefrom, when

it is again placed on the drill and the drill replaced in the screw-rod.

The drill is made in the usual spiral or twisted shape, so as to cause the borings to move out of the hole being drilled, with the bit or point of diamond shape and the edges of the drill turned slightly forward, so that it cuts very easily.

L represents a small bar of steel, adapted to a hole in the tube or pipe A, as shown in Fig. 2, to prevent it from turning when making the drill.

Further description of the operation of my improved drill is deemed unnecessary, it being obvious from the foregoing.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the tube or pipe A and screw-rod C, carrying the drill, of the detachable tubular frame B, provided with stub axle or axles *b*, gear wheel or wheels F,

mounted thereon, guard D, and gear-wheel F', keyed to the screw-rod, the several parts arranged relatively to each other and adapted to be operated substantially in the manner herein shown and described.

2. The combination, with the screw-rod, of the removable drill, having an enlarged bit or point, and the detachable or removable open-ended tube or jacket of less diameter than the enlarged end of the bit or point, substantially as and for the purpose herein shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of October, 1882.

THOMAS ^{his} × RADFORD.
mark.

Witnesses:

THOS. SLADE,
E. M. HAMILTON.