L. M. Gilmore,

Rock Drill.

No. 53,602. Patented Apr. 3, 1866.

Fig. 1.

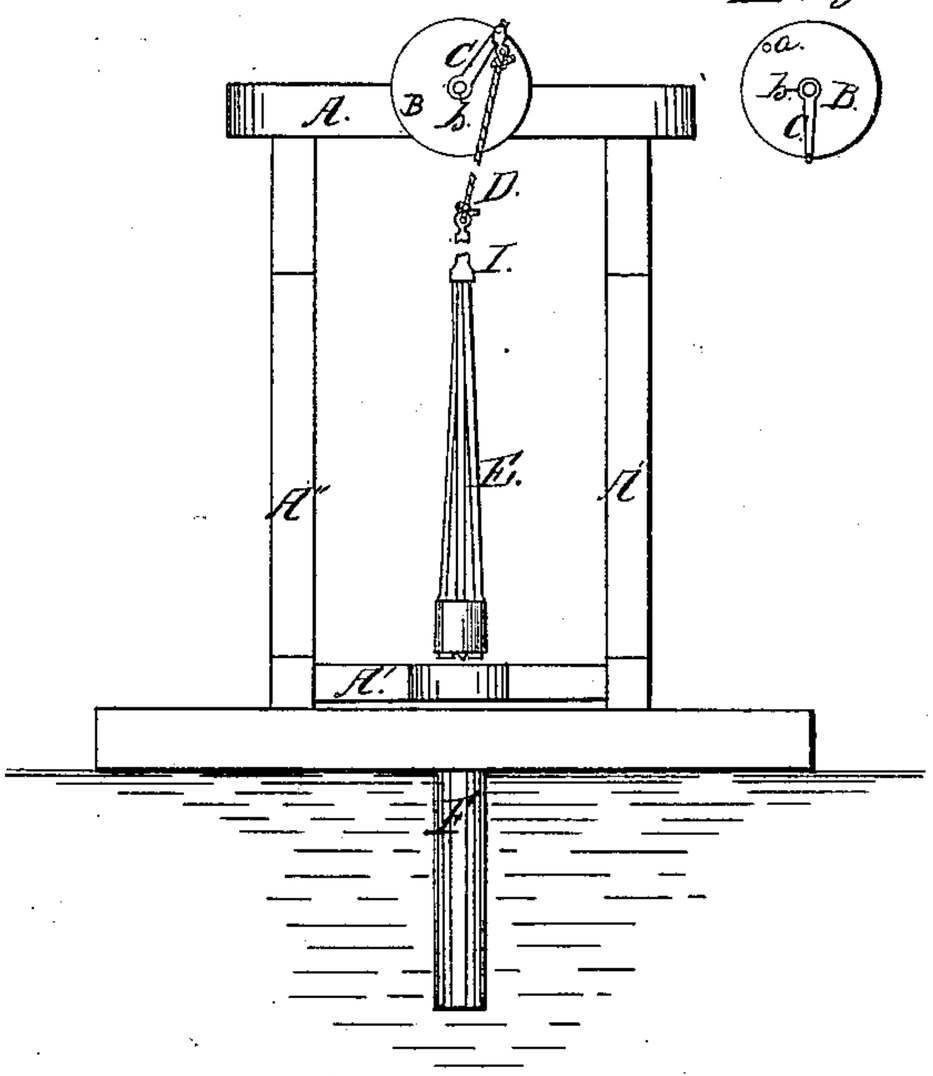


Fig. 2.

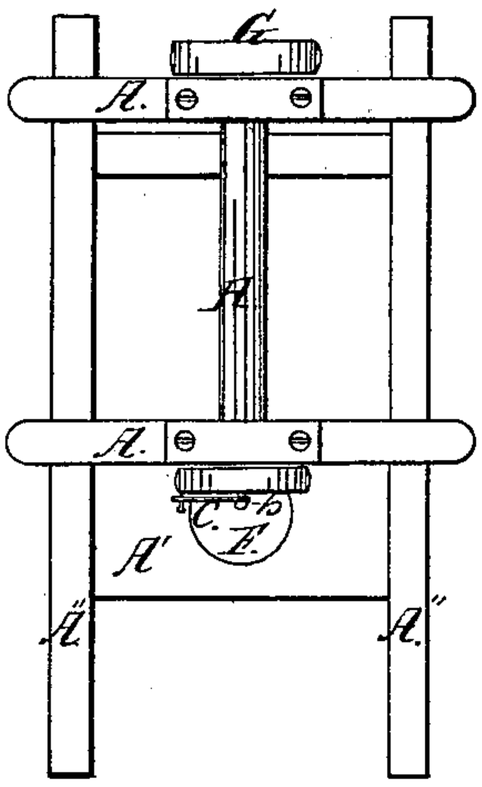


Fig. 9.

Fig. 8.

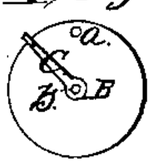


Fig. 7.

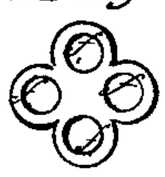


Fig. 6.

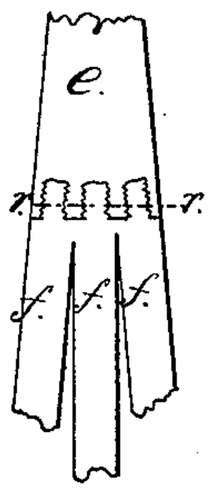
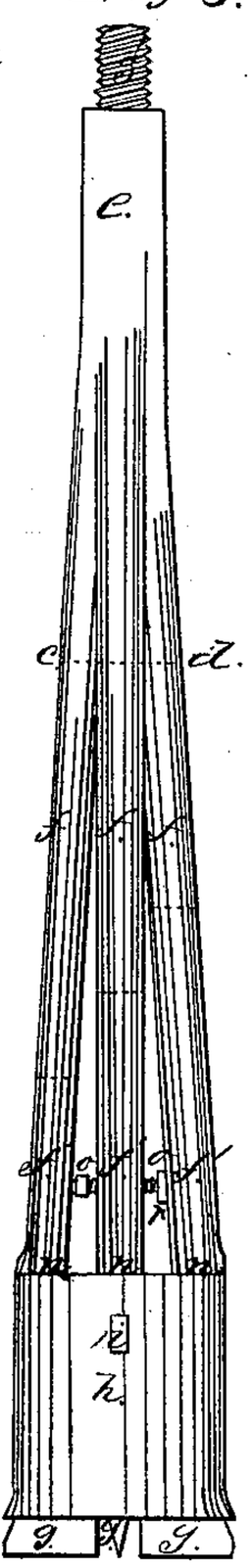
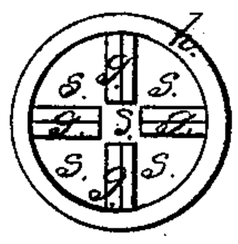


Fig. 5.

Fig. 3.





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Inventor:
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AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

LUCIUS M. GILMORE, OF JANESVILLE, WISCONSIN.

IMPROVED ROCK-DRILL.

Specification forming part of Letters Patent No. **53,602**, dated April 3, 1866.

To all whom it may concern:

Be it known that I, LUCIUS M. GILMORE, of the city of Janesville, in the county of Rock and State of Wisconsin, have invented a new and improved mode of constructing and operating a Machine for Drilling Rock; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, like characters referring to like parts in each figure.

The nature of my invention consists, first, in constructing a built tool for drilling rock or boring wells with a cutting-band or reamer; second, in constructing a built tool for drilling rock or boring wells with central open spaces, to allow the tool to operate more easily or with greater facility in the stone chips or débris; third, in operating a built tool, constructed substantially as hereinafter described, by means of a drop-crank.

To enable others skilled in the mechanical arts to construct and operate my machine, I will refer to the accompanying drawings, in which—

Figure 1 is an end view or elevation of my machine, with a sectional view of the well F. Fig. 2 is a top view or plan, showing, also, the mouth of the well F. Fig. 3 is a side view of the drill or built tool E, Fig. 1. Fig. 4 is an end view of the same. Fig. 5 is a vertical section of one of the chisels of the built tool. Fig. 6 is a detail drawing showing another mode of attaching the stems of the chisels to the chisel-head *e*. Fig. 7 is a transverse section of the parts shown in Fig. 6, cut on the line *r r*. Figs. 8 and 9 are side views of the sheave or wheel B and drop-crank C, showing different positions of the latter during a revolution of the wheel B.

I construct the frame A A′ A″, Figs. 1 and 2, or supporting part of my drill, of any convenient form or size and from any suitable material, and upon it secure a shaft, H, to the end of which is firmly attached the sheave or wheel B, that has a lifting stud or pin, *a*, which as the wheel B revolves lifts or raises the drop-crank C. The drop-crank C plays freely upon its bearing *b*, and is attached in any suitable manner, as by a rope, D, to the auger-stem, I, which (meaning the auger-stem) may be of any desired length, and to which the chisel-head *e* is firmly secured in any suitable manner, as by tapping the auger-stem and screwing them together. The stems or bodies *f f′* of the chisels may be made entire and welded to the chisel-head *e*, as shown in Fig. 3, or screwed into the head *e*, as shown in Figs. 6 and 7; but I prefer, in order to facilitate the sharpening of the tool, to make the stems in sections *f* and *f′*, Fig. 5, which may be screwed together, as therein shown.

I construct the drill or built-tool E, Fig. 1, with two or more chisels, having separate stems *f* and *f′*, Figs. 3, 5, and 6, and open spaces *s*, Fig. 4, between them, to allow the passage of the stone chips and débris, which chisels I usually encircle with a cutting-band or reamer, *h*, that serves the double purpose of banding the chisels and reaming the shaft as it is sunk. The band or reamer encircles the necks of the chisels, and is maintained in position by the shoulders *n* and tenons *i*, or their equivalents. The tenons fit in mortises in the band or reamer, and the band or reamer presses against the shoulders of the chisels, thereby securing to the band or reamer permanency and stability. The chisels are prevented from pressing in toward each other by the set-screws *o*, Fig. 3, which also serve to expand the chisels for different-sized bands or reamers.

To operate my machine it is only necessary to revolve the shaft H, Fig. 2, which, in turn, revolving the wheel B, operates the drop-crank C by means of the stud or pin *a*. As the wheel B revolves the pin *a* raises the crank and the drill or built tool attached thereto, as shown in Fig. 1, until the pin *a* reaches a point vertically over the bearing *b* of the crank, when the latter, as shown in Fig. 8, begins to fall, describing in its course a semicircle, and stops in the position shown in Fig. 9, so allowing the drill to descend with its full weight upon the rock to be drilled. In the mean time the pin *a*, following, soon overtakes the crank in its last position and again raises it, to repeat the operation as before.

Among other advantages of a drill constructed as herein described I will mention, first, that by the use of the drop-crank but little power is lost by friction or otherwise; second, the connection between the drill and operating mechanism, being constantly kept up, no separate stopping mechanism is required, as is

the case in the ordinary drill where this connection is broken during the downward stroke; third, owing to the circular motion of the crank, the downward course (after the drill has struck) of the heavy mass of rope and other connections with the drill below (so necessary in sinking deep wells) is gradually arrested, consequently avoiding or obviating that heavy crushing strain upon the operating mechanism experienced in the ordinary machines for drilling or boring wells where the perpendicular course of this heavy mass is suddenly arrested; fourth, the drill or built-tool, being built of distinct separate parts, can be readily taken apart and easily and cheaply sharpened; fifth, the several chisels, being entirely independent of each other in their cutting, and striking no two consecutive times in the same place, one side of the well cannot be sunk any faster than any or all other sides, so that there is no danger of the shafts deviating from a perpendicular; sixth, the chisels being on separate stems and separated from each other by open spaces, the stone chips and débris present less resistance to the operation of the drill than to one more compactly built; seventh, the cutting-band or reamer keeps exact pace with the chisels and gives perfect rotundity to the well without the necessity of turning the drill or changing the instrument, thus performing with one instrument and one operation work which is usually performed by two instruments and two operations.

I am aware that a drop-crank, as also a built tool, has been used, and I do not claim them, or either of them, separately; but

What I do claim, and what I desire to secure to secure by Letters Patent, is—

The drill or built tool E, when constructed and arranged substantially as and for the purpose set forth.

LUCIUS M. GILMORE.

Witnesses:
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H. RICHARDSON.