(No Model.)

J. F. ALLEN.

PORTABLE DRILLING MACHINE.

No. 306,375. Patented Oct. 14, 1884.

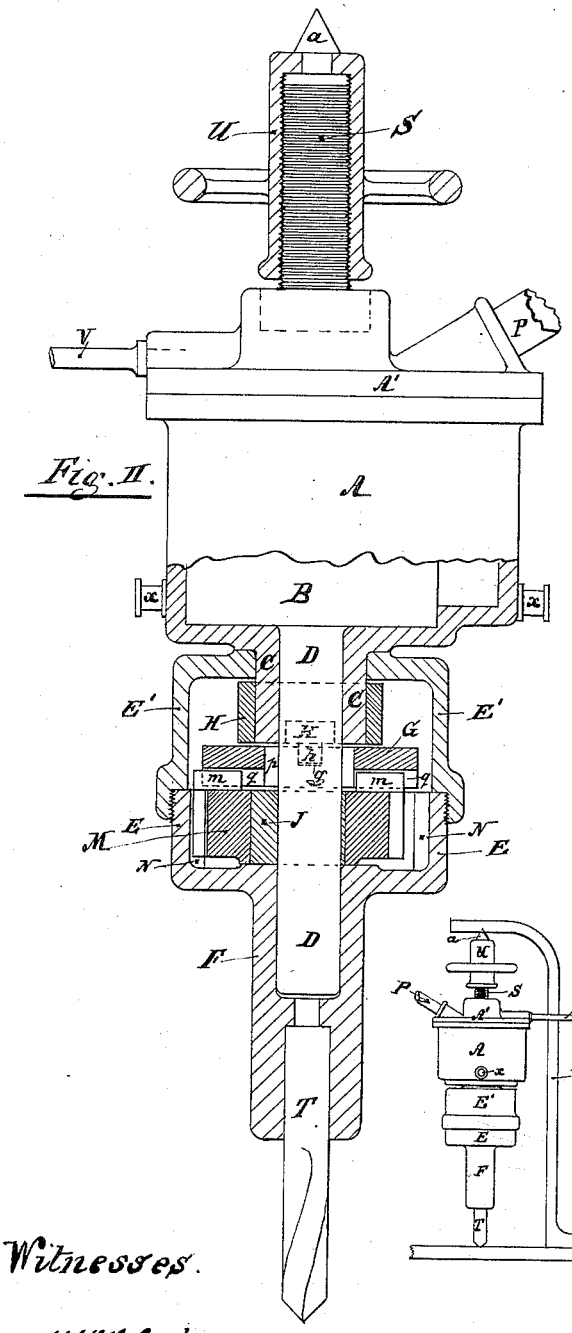

Fig. II.

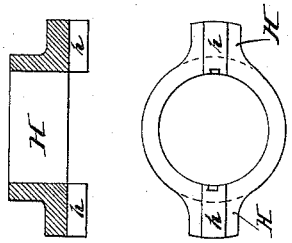

Fig. III.

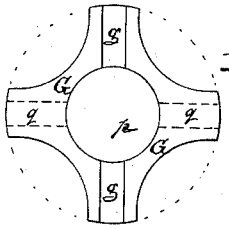

Fig. IV.

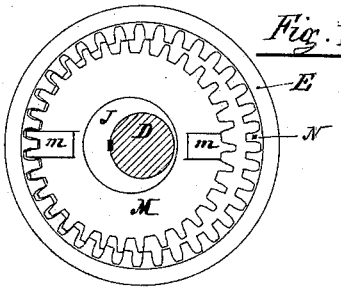

Fig. V.

Fig. I.

Witnesses.

M. M. Klein

G. Sarmiguet

Inventor.

John F. Allen

per Henry E. Rader

Attorney.

UNITED STATES PATENT OFFICE.

JOHN F. ALLEN, OF BROOKLYN, NEW YORK.

PORTABLE DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,375, dated October 14, 1884.

Application filed December 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. ALLEN, a citizen of the United States, residing at Brooklyn, in the State of New York, have invented a new and Improved Portable Drilling-Machine, of which the following is a specification.

The nature of my invention consists in the combination of a suitable rotary engine or other motor, the required gearing for reducing the speed of the rotary engine or motor to that required by the drilling-tool, the whole of which is inclosed in a suitable casing, and the drilling-tool, all of which elements are in a line, one below the other, to make the machine light and portable, and free from all danger to the person operating the machine.

In the accompanying drawings, Figure I represents an elevation of my improved drill fixed in position for operation. Fig. II is a side view, partly in section. Fig. III is a cross-section and plan of carrying-arms. Fig. IV is a top view of plate G, and Fig. V is a top view of the driving-gearing.

Similar letters represent similar parts in all the figures.

A represents the case of a rotary engine, and B the revolving piston or disk of the same. On the under side of the engine-case a hub, C, is arranged, through which the revolving shaft or spindle D passes. Around the hub C the upper part of a case, E′, is fitted, capable of turning freely on the same. The lower part, E, of said case, which is screwed into or otherwise attached to the upper part, E′, guides the end of the shaft or spindle D in a suitable hub, F, to the lower end of which the drilling-tool T is fixed.

To the cover A′ of the rotary engine a screw, S, is fixed, over which the screw-cap U passes, and through which, when the end center, *a*, is fixed in a stationary arm, W, Fig. I, the length of the drilling-machine can be regulated, and the drilling-tool forced into the work as the drilling of the hole progresses.

To the cover A′, or to any part of the casing A of the rotary engine, a projection or handle, V, is attached, which, during the operation of the engine, bears against the side of the stationary arm or frame W, holding thereby the casing stationary while its internal disk or piston is made to revolve.

To the end hub, C, of the case A the hub of the carrying-arms H is firmly attached. These arms are provided with projections *h* at their under side, sliding in corresponding grooves, *g*, in the upper surface of a plate or coupling, G, having in its lower surface similar grooves, *q*, at right angles to the grooves *g*. This plate or coupling is placed perfectly loose around the spindle D, with its central hole, *p*, of sufficient size to allow a free side motion in either direction to said plate or coupling G without its coming in contact with the revolving shaft or spindle D. Below this plate or coupling G a circular disk, J, is firmly attached, eccentric to the shaft or spindle D, around which a pinion, M, resting upon the bottom of the case E, turns freely. This pinion M has on its upper surface projections *m m*, opposite and in a line with each other, working in the grooves *q q* in the lower surface of the plate or coupling G. The teeth of this pinion M are made to work into the teeth of an internal gear, N, attached to or cast on the inside of the lower part, E, of the case, and which said case, consisting of the lower part, E, and upper part, E′, incloses the carrying-arms H, the loose plate or coupling G, and pinion M, as well as the internal gear, N, thereby preventing any danger to the operator while handling the machine, and likewise preventing anything from coming at or between the moving parts to interfere with their regular operation.

The operation is as follows: Air, steam, or gas pressure being introduced at P into the case A, the internal piston or disk, B, will be made to revolve in the usual manner, thereby causing the regular turning or revolving of the projecting shaft or spindle D.

The internal construction of this rotary engine has not been described, as the same forms the subject of another application; but any one of the at present known rotary engines will answer this purpose.

The revolving of the spindle D will communicate motion to the pinion M through the disk J, attached eccentric to said spindle D. But, as above described, the projections *m m*, attached to this pinion M, move in the slots *q q* in the plate or coupling G, and said plate or coupling G, being prevented from turning by the projections *h h* on the arms H H, although allowed to move sidewise on said projections *h h*, will cause the motion communicated by

the rotating disk J to the pinion M to result in a motion from right to left and forward or backward, at right angles to each other, causing thereby, through the connection of its teeth with the teeth in the internal wheel or gear, N, the revolving of said gear N, as well as of the casing E E′, and of the drilling-tool T. The eccentric disk J, attached to the shaft or spindle D, carries the pinion M around the pitch-line of the internal gear, N, and as this pinion M moves loose on the disk J, and is prevented from revolving, but allowed to partake of the eccentric motion of the disk J by means of the plate or coupling G, connected to the fixed head D through projections *h*, and through the projections *m* with the pinion M, said pinion M will cause the internal gear, N, and consequently the casing E, to the lower part of which the tool T is attached, to revolve. By this arrangement of the pinion M, working into the internal gearing, N, in the manner described, the naturally quick speed of the rotary engine will be reduced to the required speed of the cutting-tool T, and this reduction of the speed may be increased or diminished by changing the pinion M for one having either more or less teeth, as may be required. The end of the case E′ bears against the under side of the rotary-engine case A, and any pressure produced by the action of the screw-cap U and screw S will be communicated through the case A, case E′ E, to the drilling-tool T, without any friction or pressure to the parts and gearing inclosed in the case E′ E.

If the machine is to be used in any other direction than a perpendicular one, the same may be supported by a suitable strap attached to the projections *x x*.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A portable drilling-machine consisting of the following elements: a rotary engine or other motor, a case, E′ E, with hub F, supporting the end of the rotary shaft or spindle D, and the drilling-tool T in its end, arms H, attached to the hub of the stationary casing of the rotary engine, loose plate G, disk J, pinion M, and internal gear, N, attached to or cast in the case E, the whole being combined and arranged to operate in the manner and for the purpose substantially as described.

2. In combination with the rotary spindle D, eccentric disk J, fixed arms H, with projections *h*, plate or coupling G, with grooves *g* and *q*, pinion M, with projections *m*, and internal gear, N, the surrounding casing E′ E, with the drilling-tool T attached, substantially in the manner and for the purpose herein described.

JOHN F. ALLEN.

Witnesses:
HENRY E. ROEDER,
G. SARNIGUST.