J. F. Summers,

Rock Drill.

No. 94,923. Patented Sept. 14. 1869.

Fig 1

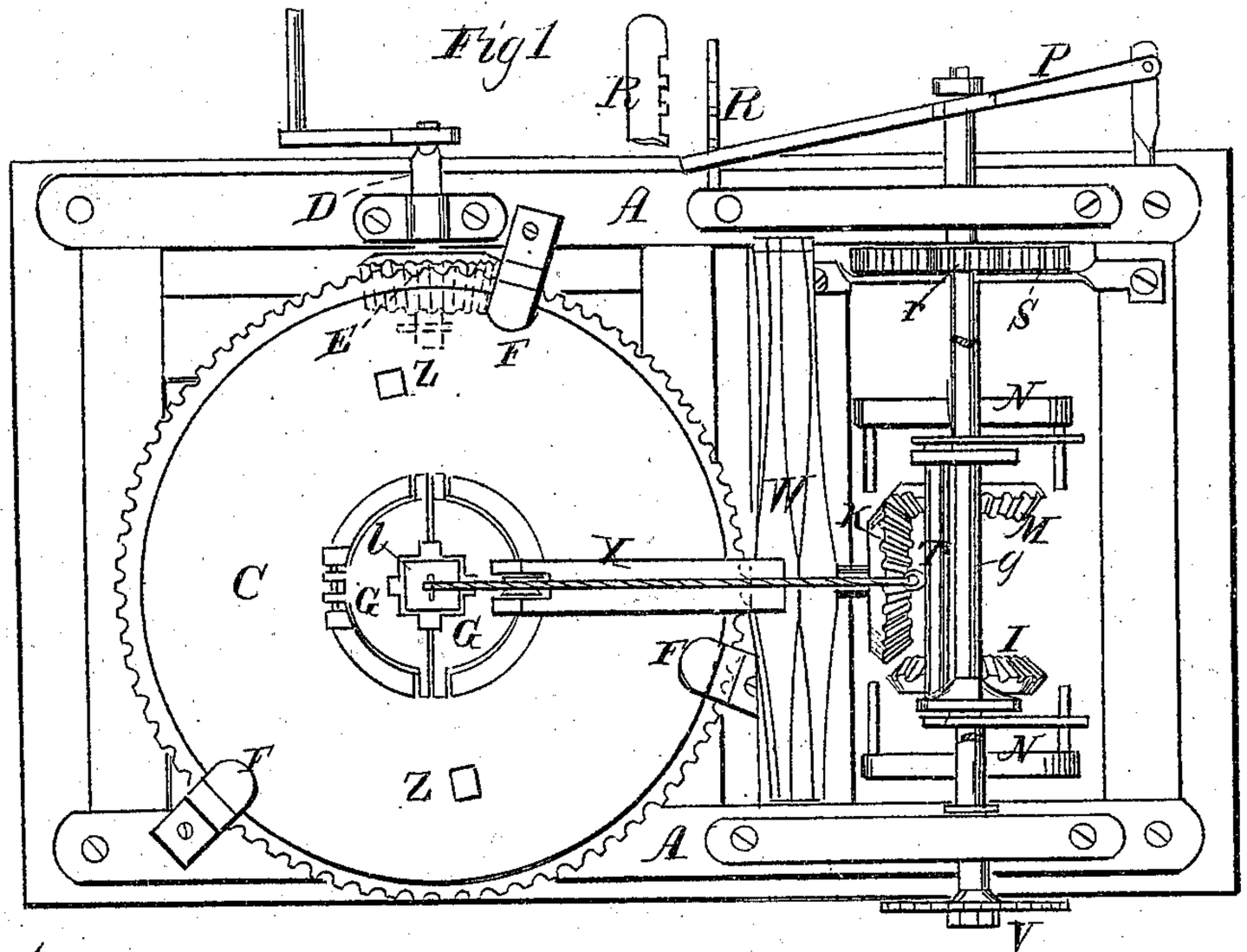

Fig 4

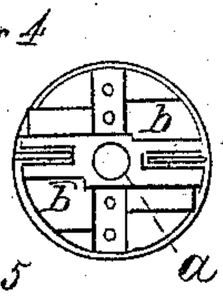

Fig 5

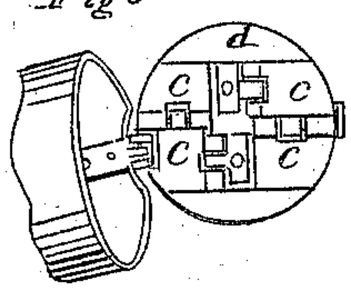

Fig 2.

Fig 3

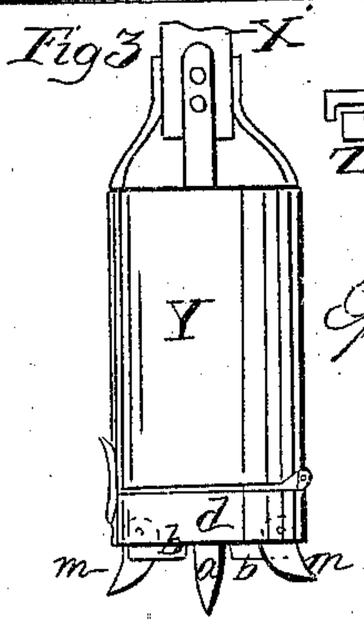

Fig 6

Witnesses.

Harry King.

A. M. Marr

Inventor.

John F. Summers

Per

Alexander & Thomson

Attys

United States Patent Office.

JOHN P. SUMMERS, OF TIFFIN, OHIO.

Letters Patent No. 94,923, *dated September* 14, 1869.

IMPROVED ROCK-DRILL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN P. SUMMERS, of Tiffin, in the county of Seneca, and in the State of Ohio, have invented a new and useful Improvement in Rock-Drill and Well-Boring Machines; and 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.

The nature of my invention consists in the arrangement of certain devices, so as to form a machine for drilling and boring wells and piping, as will hereafter be fully set forth and described.

Figure 1 is a plan view of my machine.

Figure 2 is a section view of the same.

Figure 3 is a side view of the piping-auger.

Figure 4 is a bottom view of the same.

Figure 5 is a plan view of the bottom, showing the arrangement of the valves

Figure 6 is a plan view of the arm, by means of which the auger is operated.

A represents the frame of my machine, which may be of any size and shape desired.

At one end of this frame is placed the bed-piece B, upon which the master-wheel rests and revolves.

In the centre of this bed there is a large circular opening made, through which the augers and drills are lowered and raised, and is provided with a collar upon its rim, so as to receive the flange upon the bottom of the master-wheel C.

Upon one side of the frame A is placed a short shaft, D, to which the motive power is applied, for running or operating the machine.

To the inner end of this shaft there is attached a small cog-wheel, E, which gears in and communicates the motion to the master-wheel.

This wheel C is placed upon the bed-piece B, in such a manner as to allow it to revolve freely around, for the purpose of operating the augers and drills, and also giving motion to the other parts of the machine.

In order to retain this wheel in its proper position, there has been a circular flange cast upon its under side, which runs around the opening in its centre, and fits in the neck upon the bed-piece B, and secured to the frame there are a number of clasps, F, to hold it down.

Through its centre there has been a large circular opening made, which is provided with two semicircular doors, G, pivoted or bolted on, so that they can be opened or closed at pleasure.

There is a square aperture or opening made through them, so that, when closed, they will grasp the shaft X, connected to the auger, and as the wheel revolves, the auger will thus be made to bore.

As this shaft will consist of a great many pieces, which will have to be secured firmly together by bolts passing through, and then have nuts screwed upon their ends, upon each side of this opening there has been a small notch made, so as to allow these bolt-heads and nuts to pass.

Rising from the top of this wheel there are two upright posts or pillars, Z Z, placed upon opposite sides of the opening, which catch the ends of the arm H, upon the top of the auger shaft, and thus assist in turning and operating it.

Upon the lower rim of this master-wheel there are cogs, for the purpose of receiving motion from the wheel E, and then in turn imparting it to the one I.

Attached to the same shaft, as the wheel I, upon the opposite end, is placed the meter-wheel K, which gears in two others, L and M, for the purpose of lowering and raising the drills and augers.

Upon the same shaft, which extends from one side of the frame out through on the other, there are placed two disks, N, the cog-wheel O, as shown by dotted lines in fig. 2, and upon its outer end the lever P. By means of this lever the wheels L and M are thrown in and out of gear.

Extending out from the side of the frame there is a metal plate, which has three notches cut in its upper edge, for the purpose of holding the lever at any desired place.

When swung far enough around, so as to catch in the notch nearest to the frame, the wheel M is thrown into gear with the wheel K, so as to elevate or raise the drills from the hole. When in the middle one, it throws the drills entirely out of gear, but when in the outer one, the wheel L is thrown in gear, so as to lower the drills.

Placed immediately above the cog-wheel O there is a second one, of the same size, which gears with it.

Upon the same shaft as the wheel S there is placed a tilting-frame, T, and a reel, upon which the rope or chain, connected to the drills, is wound.

This tilting-frame consists of two pieces, bent in the shape of a square, and connected by a rod, which has a loop or staple attached to it. The other two ends hang down, so that the long arms or projections upon the two disks N will give it a reciprocating motion.

Extending across the frame there is a third shaft, provided with a small cog-wheel, *r*, so as to mesh in with the one S, upon the outer end of which is placed a ratchet, V, which will be controlled by a pawl, so as to hold the auger or drill when elevated.

Pivoted between two parts of the frame there is a cross-piece, to which is attached a derrick-pole, provided at its upper end with a pulley, over which the rope or chain passes. This pole X can be raised or lowered to any angle, and is used to raise and lower the drills or augers.

Letter Y, fig. 3, is the auger I use in boring wells.

This auger consists of a large cylinder, having a movable bottom, in which are placed the drills, as seen is fig. 4. Across the bottom of this cylinder there are two bars, placed at right angles with each other, through which the auger-point *a* is placed.

Extending down below the edge of the bottom, there are two auger-blades, *b*, which not only cut the earth loose, but convey it upward into the cylinder.

Upon the top of this movable bottom there are two double valves, *c*, which are formed like small trap-doors, two being pivoted together. As the dirt is conveyed upward by the blades *b*, these doors or valves will be forced open, so as to let it pass upward, but will remain closed as soon as the cylinder is lifted upward, by the weight of the dirt.

The shaft, which is connected to this cylinder, can be lengthened at pleasure, by the addition of other pieces, and is provided with an arm, H, as seen in fig. 6, at its top. This arm consists of a long rod, indented in the middle, so as to receive the shaft, and then has a metal clasp, so as to secure them firmly together. Near each end, but upon opposite sides, there are slots cut in, so as to receive the projections upon the master-wheel C. Clasping the top of this shaft and of the drills, there is a metal brace or clasp, in the top of which there is a small hook or staple fastened, in such a manner that the shaft or drills can be turned without twisting the rope or chain. The two small bits *m* are used for boring in quicksand, and will adjust themselves.

The operation of my machine is as follows:

When I desire to bore a well, I employ the auger Y. The machine is placed over the spot where it is intended to sink the well, so that the opening in the master-wheel C will come directly over it. The doors G are then opened, and the auger inserted. The lever P is made to catch in the middle notch in the serrated plate R, so as to throw all the rest of the machinery out of gear, until it is desired to use it.

The motive power is then applied to the shaft D, through which the motion is communicated to the master-wheel C. As this wheel revolves, the two projections upon its face catch the arm H, causing the auger to revolve also. As soon as the cylinder has been filled with earth, the lever P is moved over, so as to catch in the notch nearest to the frame, so as to throw the wheel M in gear with the one K. As the rope or chain, to which the auger is attached, passes over the pulley on the end of the derrick X, and then is secured to the reel *g*, as soon as this is set to revolving the auger is raised from the hole. The movable bottom *d* is then opened downward, and the earth allowed to drop out, when it is again ready to bore. The lever is then moved outward, so as to catch in the last notch, which brings the wheel L into gear, which causes the reel to unwind, and lower the auger into the hole again. As this auger is provided with two movable drills or cutters, *m*, the size of the hole can be varied at pleasure.

When it is desired to use the machine for drilling, instead of boring, the auger is removed, and the drill *l* attached to the end of the chain or rope, while the other one is removed from the reel, and attached to the hook in the tilting-frame T. The doors G are closed, so as to serve as a guide to the drill, and impart to it a rotary motion. As soon as the machine is set in motion, the long arms upon the two disks N, in revolving, engage with the tilting-frame, and in moving it out and upward, raise the drill from the rock, and as the arms allow it to slip back, the drill falls with all its weight upon the stone.

Having thus described my invention,

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

1. The miter-wheel C, provided with the hinged doors G G, all constructed and used substantially as and for the purposes specified.

2. The auger Y, when provided with the movable bottom *d*, and valves *c*, and adjustable bits or drills *m*, when used in the manner and for the purpose set forth.

3. The arrangement of the tilting-frame T T, disks N N, rock-shaft W, and arm X, with the drill *l*, all connected and operated substantially as and for the purposes set forth.

4. The arm H, in combination with the auger Y, when used in the manner and for the purpose specified.

5. The combination of the lever P and shaft with wheels L and M and the wheel K, all operating substantially as and for the purposes set forth.

6. The arrangement of the wheels L, M, I, K, C, E, and disks N N, all substantially as and for the purposes set forth.

7. The arrangement of the wheels O, S, and *r*, reel *g*, tilting-frame T, and derrick X, when combined for the purpose set forth.

In testimony that I claim the foregoing, I have hereunto set my hand, this 23d day of March, 1869.

JOHN P. SUMMERS.

Witnesses:

ISRAEL LOOSE,

GEO. S. YINGLING.