J. H. Thomas.

Rock-Drill.

No. 76118

Patented Mar. 31, 1868.

Fig. 1.

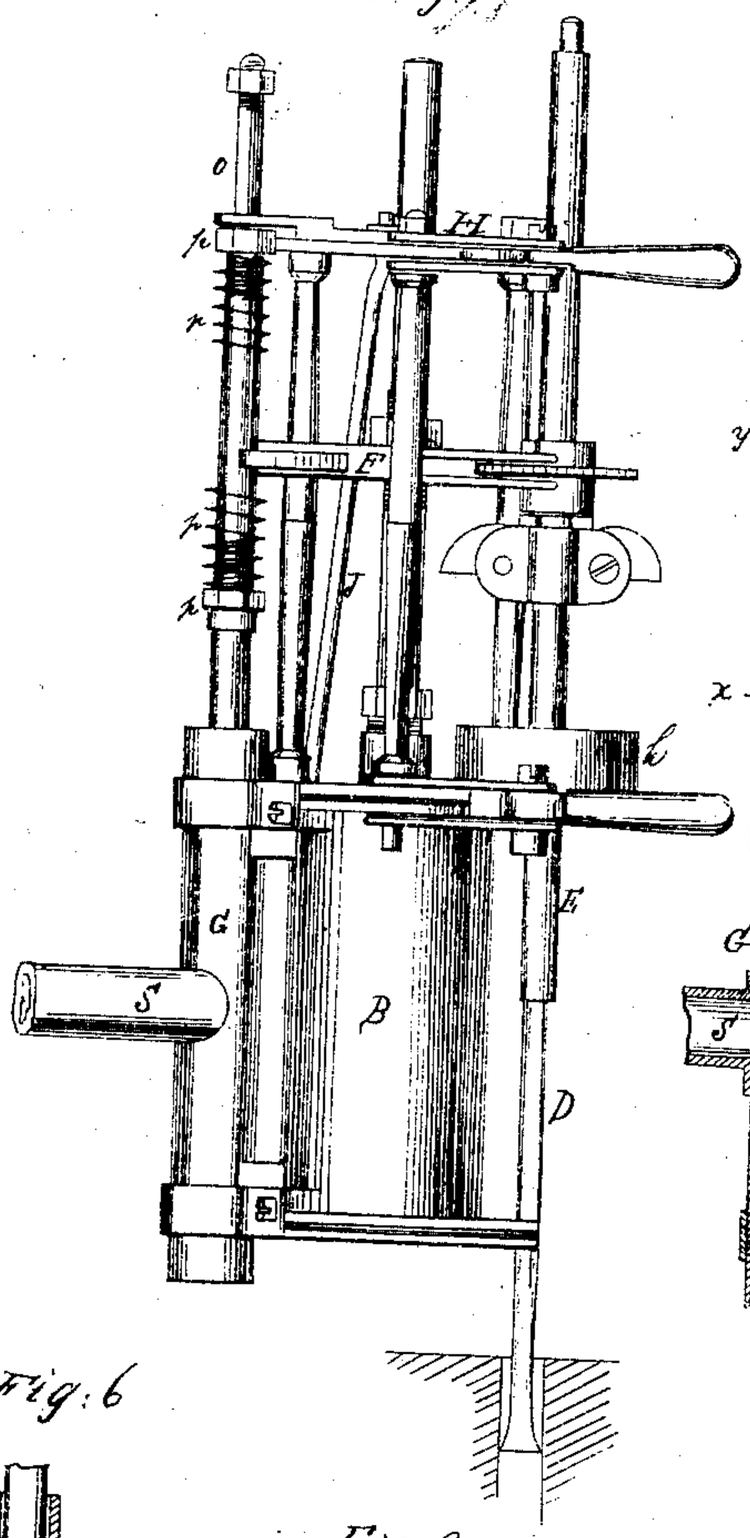

Fig. 3.

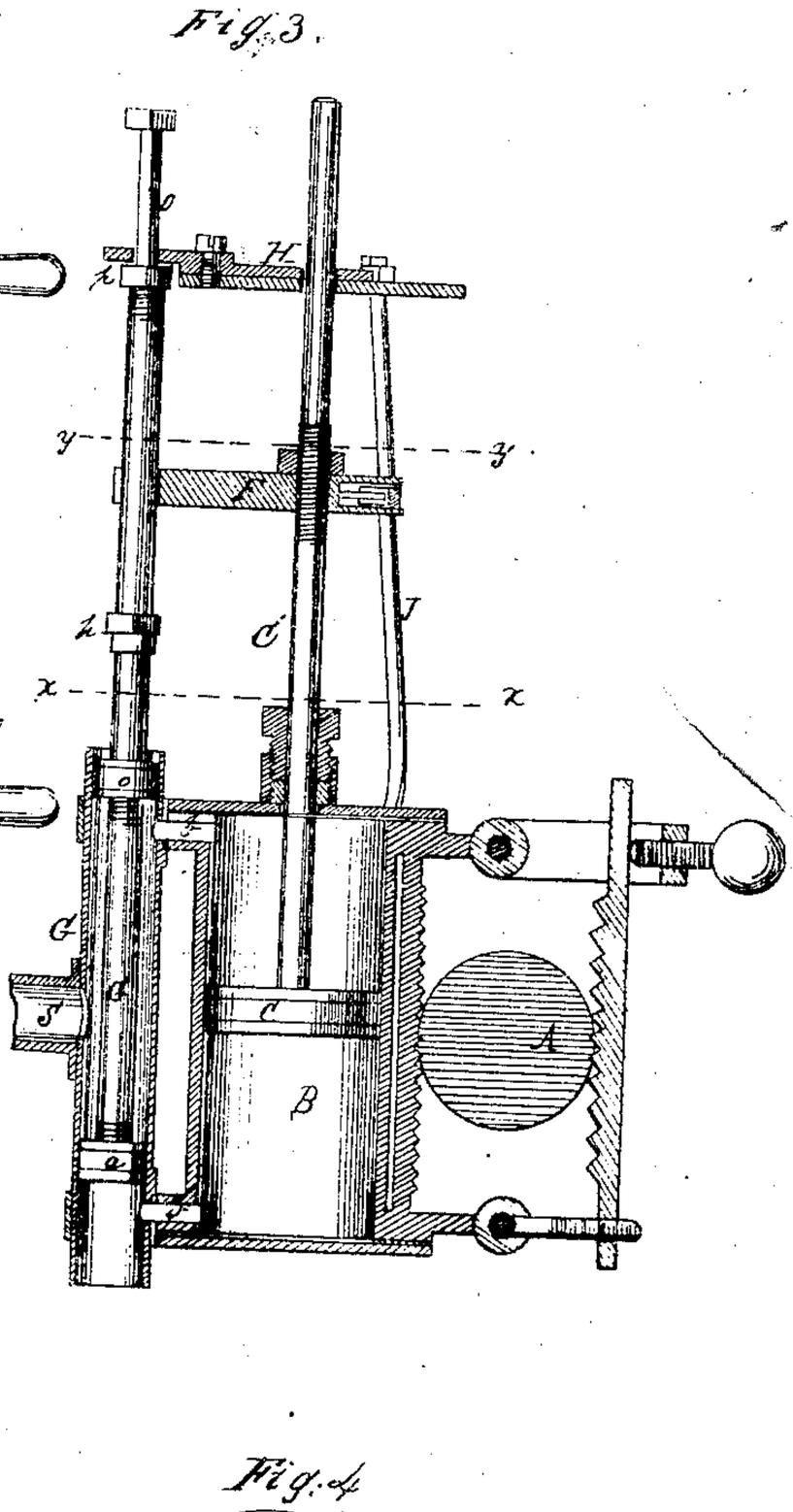

Fig. 6.

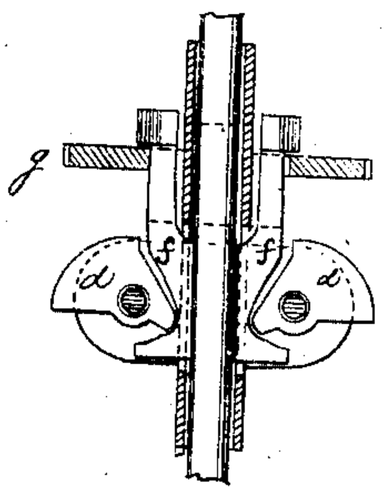

Fig. 2.

Fig. 4.

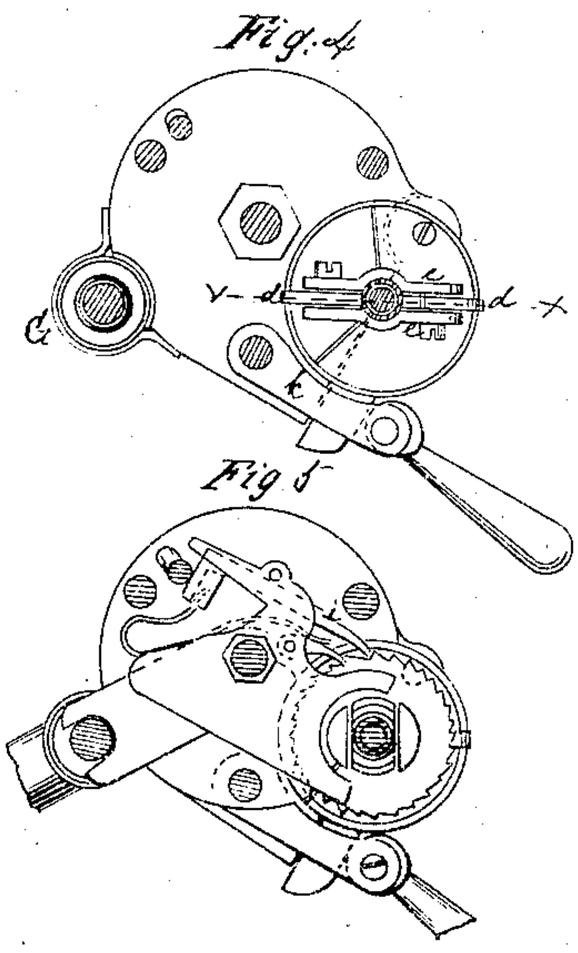

Fig. 5.

Witnesses
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JAMES H. THOMAS, OF LACON, ILLINOIS.

Letters Patent No. 76,118, *dated March* 31, 1868.

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, JAMES H. THOMAS, of Lacon, in the county of Marshall, and State of Illinois, have invented a new and useful Improvement in Operating Rock-Drills, and in steam cut-off; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification.

This invention relates to a new and improved method of operating a rock-drill, and to the manner in which the steam-engine ports are opened and closed; and it consists, first, in the manner in which the drill is attached to and operated by the cross-head of the engine; secondly, in the manner in which the drill is held and revolved; and thirdly, in the construction and operation of the steam-valves.

Figure 1 represents a side elevation of the engine, with the drill and the parts connected with them.

Figure 2 is a top view of the same.

Figure 3 is a sectional elevation through the line *x x* of fig. 2.

Figure 4 is a horizontal section on the line *y y* of fig. 3.

Figure 5 is a horizontal section on the line *z z* of fig. 3.

Figure 6 is a section of fig. 4, through the line *v v*.

Similar letters of reference indicate like parts.

This steam-drill is attached to a cylindrical piece of wood or metal, which is supported by suitable legs or posts, and which is represented in the drawing by A. When the drill is attached in the manner represented, it can be adjusted to drill holes at any desired angle. B is the steam-engine cylinder, containing a piston with piston-rod, in the usual manner. C is the piston, and C′ the piston-rod. D is the drill. E is a tube-casing, through which the drill passes. F is the cross-head of the engine, to which the drill-tube E is attached. G is the steam-chest. *a a*, fig. 3, are the valves in the steam-chest. *b b* are the steam-ports.

The top of the machine, (represented in fig. 2,) is a plate, which is suported by rods from the head of the cylinder. The piston-rod and the drill-tube pass up through this plate, which is marked H. The drill-tube is confined to the edge of this plate by a clamp and stirrup, and it is confined to the head of the cylinders in the same manner, but in the latter case there is a divided band, *h*, attached to the cylinder and to the clamp, a portion of the band being on each.

e e, fig. 4, are two plates, which are attached to the tube E. Between these plates are placed two cams *d d*, (a side view of which is seen in fig. 6,) the inner ends of which act on the drill through slots in the tube, by pieces marked *f f*, which hang from the ratchet-wheel, as seen in fig. 6. The ratchet *g* is confined to the cross-head of the engine, and moves up and down with it, as does the tube E. The ratchet is revolved between two plates, and it is so clamped to the tube that the tube and drill revolve with it. The object is to revolve the drill when it is at work in the rock. The ratchet is revolved by a spring-pawl, marked *i*, (seen in fig. 5,) which is crowded forward as it is moved up and down on the cross-head by an inclined rod, seen in figs. 1 and 3, marked J. The drill and the drill-tube work with the cross-head up and down, and the drill is confined by the cams operating against the pieces *f*. In descending, the cams strike the rim of the band *h*, and the outer ends are thereby thrown up, which relieves the drill of pressure. The outer portion of the band *h* is hinged, as seen in fig. 4, and is held in place by the stirrup *k*. The clamp and stirrup, which confine the upper end of the drill and drill-tube, are seen in fig. 2, marked *m* and *n*. The steam-chest G is a plain cylinder, with a rod, *o*, which has two piston-valves *a a*, upon it, as seen in section, fig. 3. The rod passes up through the plate H, and it is operated by the cross-head F. Above and below the cross-head there are screw-nuts placed on the rod, with which the cross-head comes in contact. These nuts are seen at *p p*. Coil-springs *r r* are placed above and below the cross-head, which act against the nuts, and which serve to break the concussion or force of the blow. The piston-valves *a a* pass above and below the ports *b b*. The steam is admitted between them through the pipe S. It will consequently be seen that the valves are balanced, the pressure being the same upon each.

As represented in fig. 3, the cylinder is taking steam above the piston or in the upper end of the cylinder, and exhausting it from its lower end. When the valves are forced down, the operation is reversed, and so on alternately.

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

1. The tube E, having the drill D, when secured to the cross-head F, upon one side, by means of the ratchet-wheel *g*, fitting between the horizontal plates, the clamps *m n*, upon the plate H, and the band *h* upon the cylinder-head, as herein described for the purpose specified.

2. The combination, with the drill D and tube E, of the plates *e e*, cams *d d*, pieces *f f*, ratchet-wheel *g*, spring-pawl *i* and inclined rod J and band *h*, arranged and operating substantially as described.

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Witnesses:

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