

H. SPEAR.

Machine for Mining Coal.

No. 133,900.

Patented Dec. 10, 1872.

Fig. 1.

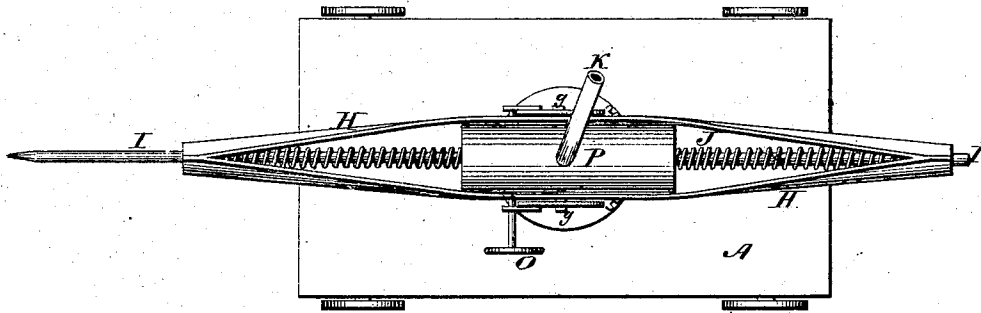


Fig. 2.

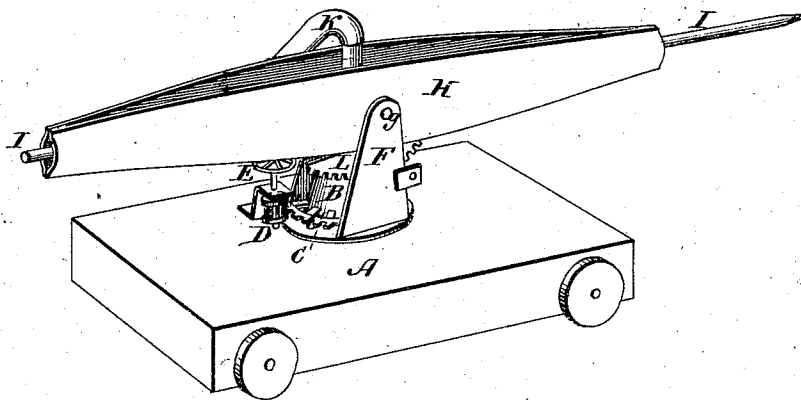
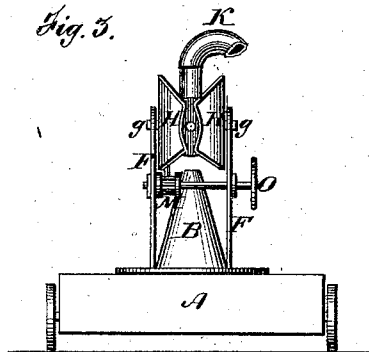


Fig. 3.



Witnesses:

C. F. Brown,
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Inventor:

Hatherly Spear.

By his Attys.

H. H. Ellsworth

UNITED STATES PATENT OFFICE.

HATHERLY SPEAR, OF PORTLAND, MAINE, ASSIGNOR OF ONE-THIRD HIS RIGHT TO JOHN O. ROBINSON, OF BLACK ROCK, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR MINING COAL.

Specification forming part of Letters Patent No. 133,900, dated December 10, 1872.

To all whom it may concern:

Be it known that I, HATHERLY SPEAR, of Portland, in the county of Cumberland and State of Maine, have invented a new and Improved Coal-Mining Machine; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a top-plan view of my improved machine; Fig. 2 is a perspective view of the same; and Fig. 3, an end elevation.

Similar letters of reference in the accompanying drawing indicate the same parts.

My invention has for its object to provide for general use a coal-mining machine operated by compressed air; and to this end it consists in combining a sliding drill with a compressed-air cylinder, and in mounting both drill and cylinder upon an adjustable frame, so that the former can be adjusted horizontally and vertically to operate at any necessary angle, as I will now proceed to describe.

In the accompanying drawing, A represents a suitable platform-car, upon which is pivoted an upright or center post, B, in such a manner as to turn freely. I prefer to construct the upright in the form of a cone, provided at its base with a segmental rack, C, to engage with a pinion or lantern wheel, D, mounted in a suitable frame beside the upright, and operated by a hand-wheel, E, as shown. The upright is further provided with two side pieces, F, extending above its apex or top, to receive the trunnions *g* of the drill-frame or sides H H, which carry the drill and compressed-air cylinder P. The latter is firmly secured midway between the sides H, and the drill I passes longitudinally through its center, being guided by the ends of the sides H, which are bent so as to form short tubes or guide-rings, as shown. If desired, however, the sides may be omitted, the drill being guided wholly by the cylinder, and the latter provided with the trunnions *g*. J are springs coiled spirally around the drill at

each end of the cylinder, one end of each being secured to the cylinder and the opposite end to the drill. The compressed air is conducted into the top of the cylinder, at about the center thereof, by means of a pipe, K, connected to a suitable compressor.

When the drill is to be operated, the compressed air is let into the cylinder against the front end thereof, and a suitable piston mounted upon the drill a little in rear of the air-induction port. The pressure of the air moves the piston and drill backward against the tension of the spring J until the piston reaches the rear end of the cylinder, when the air is exhausted from the latter, or its pressure relieved in any suitable manner, and the springs J drive the drill forward with great force against the coal.

The pressure of the air upon the piston may be relieved in any convenient manner, either in the cylinder or supply-pipe. Instead of driving the drill by the springs, and moving it back by the compressed air, this arrangement may be reversed, so that the compressed air shall drive the drill forward and the springs retract it.

L is a segmental rack secured to one of the sides, H, at or near its lower edge, in such a position as to engage with a lantern-wheel or pinion, M, the shaft of which has its bearings in the side pieces F.

By operating the hand-wheel O upon the shaft, the drill is swung vertically upon its trunnions to adjust the angle at which it shall operate against the coal.

The operation of the hand-wheel E adjusts the angle of the drill horizontally with respect to the car or truck upon which it is mounted, as will be readily understood.

Having thus described my invention, what I claim is—

1. A coal-mining machine in which the drill is operated by springs and compressed air, and adapted for horizontal and vertical adjustment, substantially as described, for the purpose specified.

2. A coal-mining machine in which an ad-

justable spring-drill is adapted to operate directly through a compressed-air cylinder, substantially as herein described, for the purpose specified.

3. The combination of the springs J and drill I with the compressed-air cylinder, substantially as described, for the purpose specified.

4. In combination with the pivoted upright B, the spring-drill, and the compressed-air cylinder P, the drill-frame H H, substantially as described, for the purpose specified.

HATHERLY SPEAR.

Witnesses:

JOHN E. DOW,
NATHAN CLEAVES.