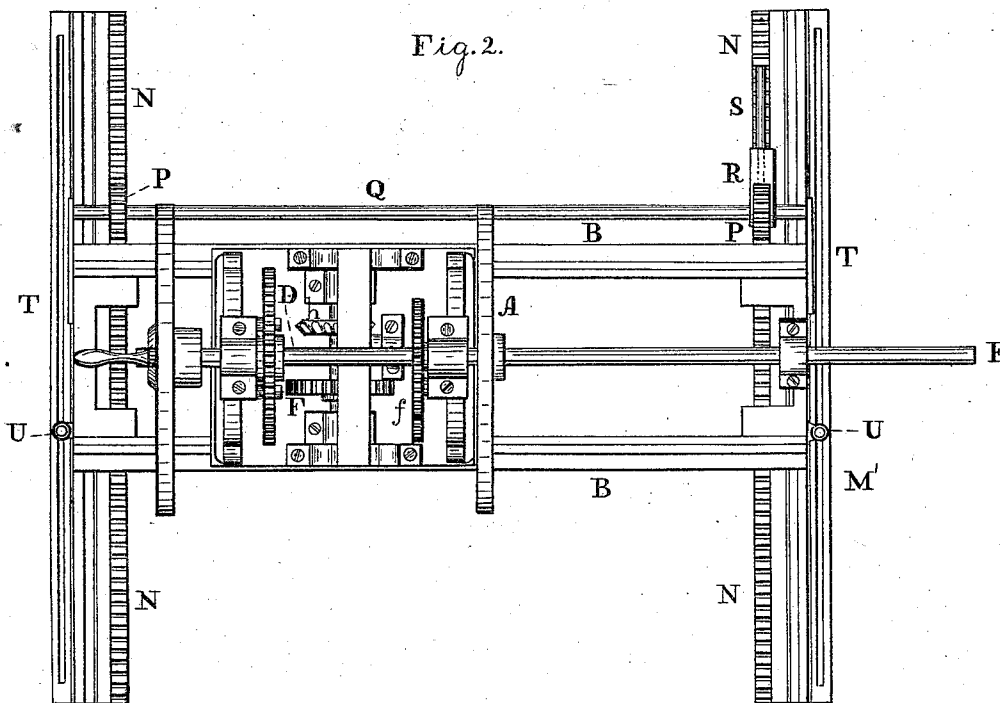
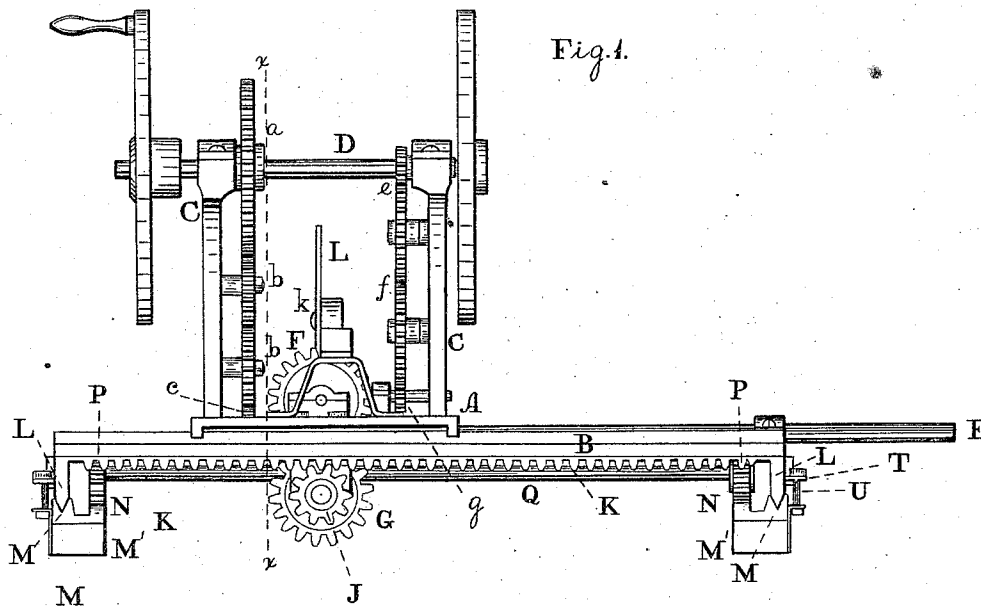


G. M. READ.
Machines for Mining Coal.

No. 158,125.

Patented Dec. 22, 1874.



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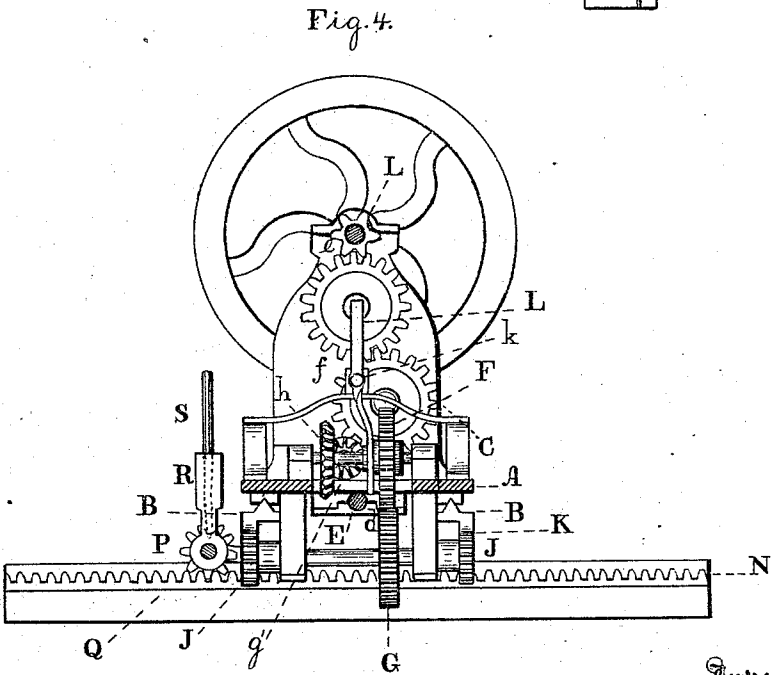
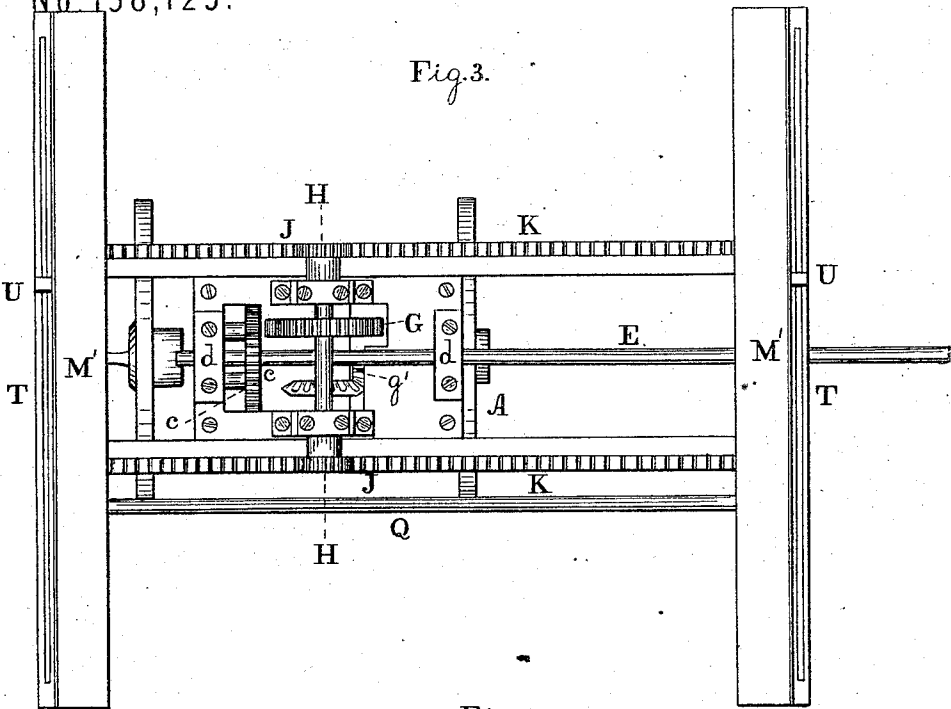
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UNITED STATES PATENT OFFICE.

GEORGE M. READ, OF KITTANNING, ASSIGNOR OF TWO-THIRDS HIS RIGHT
TO G. A. REICHERT, JR., OF MANORVILLE, AND JOHN H. REICHERT, OF
PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR MINING COAL.

Specification forming part of Letters Patent No. **158,125**, dated December 22, 1874; application filed
August 10, 1874.

To all whom it may concern:

Be it known that I, GEORGE M. READ, of Kittanning, in the county of Armstrong and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Boring Coal and other minerals; and I do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which my invention appertains to fully understand, make, and use the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of the device embodying my invention. Fig. 2 is a top or plan view thereof. Fig. 3 is a bottom view thereof. Fig. 4 is a transverse vertical section in line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in a boring-shaft, which is rotated by mechanism mounted on a carriage which advances said shaft. It also consists in means for disengaging the mechanism which advances the carriage and rotates the boring-shaft, in order to permit the return of the carriage without operating said mechanism. It finally consists in means for preventing the rising of the apparatus while in service, and guiding the same during lateral adjustment.

Referring to the drawings, A represents a carriage or platform, which is mounted on ways B, which extend longitudinally, and permit longitudinal movement of the carriage thereon. On or near the upper ends of uprights or standards C, rising from the carriage A, there is mounted the main driving-shaft D, which has keyed or otherwise secured to it on one end a toothed wheel, *a*, which imparts motion through intermediate gearing *b*, mounted on one of the standards C, to a pinion, *c*, which is secured to a longitudinally-extending boring-shaft, E, whose bearings *d* are on the carriage A. The other end of the main shaft D carries a pinion or toothed wheel, *e*, which imparts motion to gear-wheel *f*, mounted on the other standard C, and to a wheel, *g*, whose shaft extends longitudinally,

and carries a bevel-wheel, *g'*, which meshes with a bevel-wheel, *h*, whose axis extends transversely, and also carries a pinion, F, with which meshes a pinion, G, mounted on a shaft, H, whose bearings are secured to the carriage A, but extend below the bottom thereof, so that the shaft H is below the ways B. The ends of the shaft H carry pinions J, which engage with stationary rack-bars K, which are formed with or secured to the under side of the ways B, and extend in the same longitudinal direction therewith. The pinion F, by means of a feather-key or other appliance, is permitted to slide on its axis, but always rotates therewith, the sliding or shifting being accomplished by means of a lever, L, having its fulcrum *k* on a standard rising from the carriage A, the said lever being conveniently accessible from both sides of the carriage, the parts being seen more clearly in Figs. 1 and 4. The object of the lever L is to shift the pinion F so that it may be engaged with and disengaged from the wheel G, and thus render the pinions J operative or inoperative. On the under side of the transverse end pieces or bars which connect the ways B, or frames which support said ways, there are downwardly-projecting tongues, which extend transversely, and fit in grooves M, formed in transversely-arranged bed-plates M', on which the apparatus rests. Extending on the bed-plates M', in the same direction as the grooves M, are rack-bars N, with which engage pinions P, which are arranged at the ends of a shaft, Q, and secured thereto, said shaft extending longitudinally, and mounted on bearings secured to the ends of the ways B, or the frame-work thereof. On the shaft Q is hinged a saddle or yoke, R, in which is fitted a spring-pawl, S, which will engage with the teeth of one of the pinions P, but a ratchet may be formed with or secured to said pinion P, and the pawl S engage therewith, so that when the pawl is moved in one direction the pinion will be rotated, and when moved in the other direction the pinion is inoperative.

Owing to the pinions P being at the end of the shaft Q, it is evident that the motion imparted to one pinion will be simultaneously

imparted to the other pinion. Transversely-arranged slotted guides T are secured to the beds M', and bolts U passed through the guide, their heads or nuts catching under said guides so as to connect the ways B to the bed-plates, and prevent the rising of the entire device that rests on the bed-plate, but without interfering with the lateral movement thereof.

The operation is as follows: The apparatus is properly located with reference to the bank or bed of the coal or other mineral to be bored. On rotation of the main shaft D rotary motion is communicated to the shaft E. Simultaneously therewith, the pinions J rotate, and, engaging with the racks K, cause the carriage to rotate and penetrate the bank or bed of the coal or other mineral, and thus the bore in the latter is formed. The lever L is now operated so as to shift the wheel F and disengage it from the wheel G. The carriage A is then run back, and thus withdraws the shaft E from the bore. In this movement the various gearings of the carriage A, excepting the pinions J, receive no movements, so that the carriage is easily run back, and there is no danger of the rotating parts striking or endangering the operators who may be at the sides of the apparatus. The pawl S is now operated so as to cause the two pinions P to move on the rack N, and thus carry all of the many parts that rest on the bed-plates M' laterally a distance equal to the space desired between the bores. The wheels F G being again moved in gear by the lever L, the driving-shaft D is operated, and the carriage again moves forward as the bit-shaft revolves. When the proper width of the bed or bank has been bored, the apparatus may be moved back to the original position by operating the pawl S.

It will be noticed that a single pawl operates two pinions, and causes a lateral adjustment of the apparatus uniformly at both ends,

and also serves to cause such adjustment, whether to the right or left.

The various parts on the carriage A may be duplicated and multiplied in order to operate simultaneously two or more shafts, E, and said carriage may be so mounted as to be swung at an angle for boring diagonally and vertically, but the operation of the apparatus will be the same as has been stated.

I am aware that it is not new to employ a screw whose rotation advances the bit; but as the screw has to draw the carriage and all of its mechanism the thread of the former is liable to breakage, and the part or nut in which the screw rotates is subject to severe strain. As these defects are remedied in my construction, I produce vast improvements in the art.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The sliding carriage A, rotary boring-shaft E, and intermediate gearing consisting of the parts *a b c*, parts *e f' g g' h*, and pinions F G, in combination with the pinions J and racks K, substantially as and for the purpose set forth.

2. The carriage A, carrying gearing for the rotation of the boring-shaft E and advancement of the carriage, in combination with the shifting-wheel F, also mounted on the carriage, for rendering inoperative the mechanism which causes the movement of the shaft and carriage, substantially as and for the purpose set forth.

3. The bed-plates M', formed with slotted guides T and grooves M, in combination with the tongues and bolts U, substantially as and for the purpose set forth.

GEO. M. READ.

Witnesses:

JOHN A. WIEDERSHEIM,
A. P. GRANT.