J. BLYTH.

Machine for Mining Coal.

No. 208,361. Patented Sept. 24, 1878.

Fig. 1.

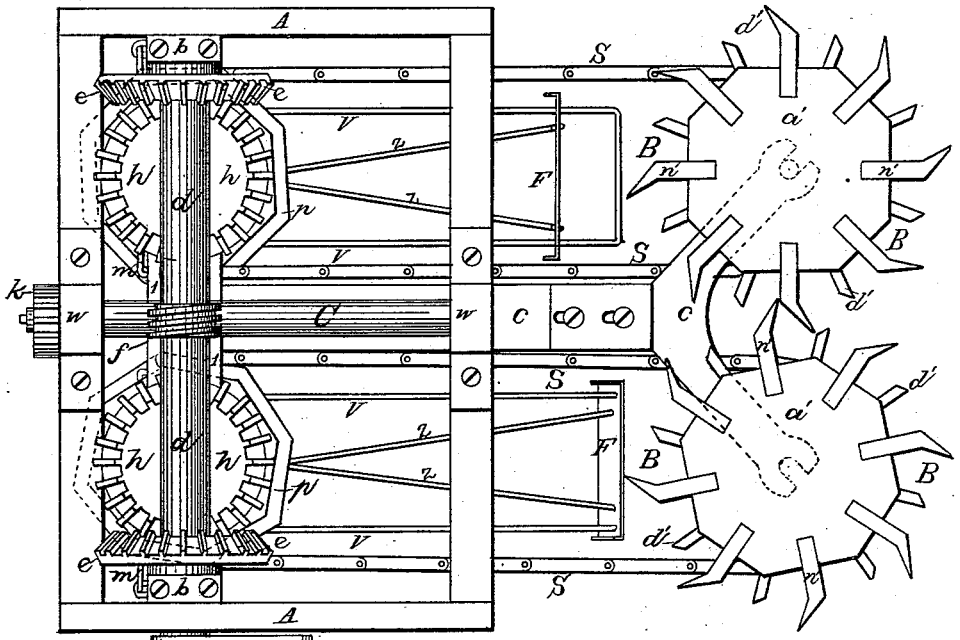


Fig. 2.

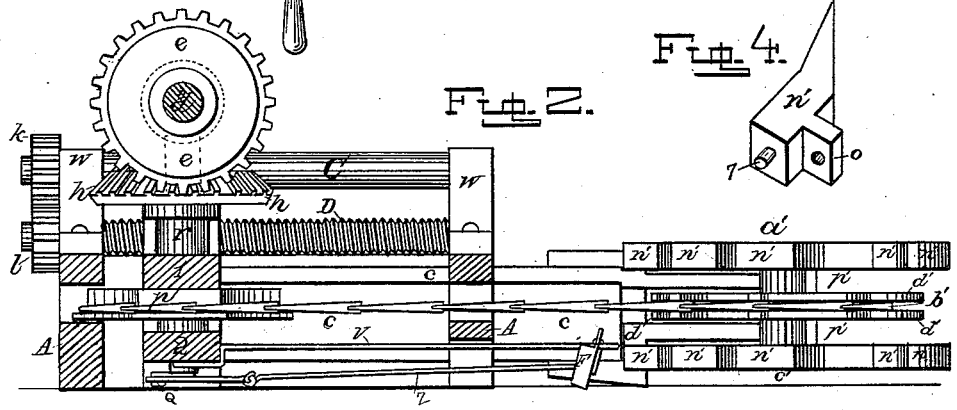
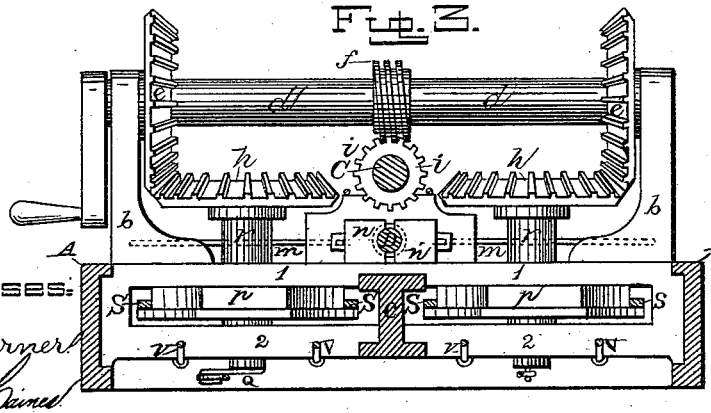


Fig. 4.

Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN BLYTH, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR MINING COAL.

Specification forming part of Letters Patent No. **208,361**, dated September 24, 1878; application filed August 7, 1878.

To all whom it may concern:

Be it known that I, JOHN BLYTH, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Mining Coal; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in machines for mining coal; and it consists in a cutting apparatus composed of armed plates, connected by endless chains with suitable gearings to communicate motion.

My invention also supplies means for removing the fine coal and dust accumulating during the operation of the machine, to prevent the clogging of wheels, as will be fully described hereinafter.

The accompanying drawings represent my invention.

Figure 1 is a plan view of my invention. Fig. 2 is a longitudinal vertical section, and Fig. 3 a vertical cross-section, of the same. Fig. 4 is a detail view.

Within a frame, A, is a second movable frame, held in place by guides, and consisting of the standards *b*, connected by cross-pieces 1 and 2. At a right angle from the center of these cross-pieces projects an arm, *c*, which, passing beyond the frame A, terminates in the shape of the letter **U**, in the ends of which are journaled the cutters B. This arm may be elongated or shortened, as required.

In the upper ends of the standards *b* is journaled a shaft, *d*, carrying near its ends the beveled wheels *e*, which gear with the horizontal wheels *h* upon the vertical shaft *r*. At the middle of the shaft *d* is a worm, *f*, gearing with a pinion, *i*, on the shaft C, which shaft is journaled in fixed supports W upon the frame A, at a right angle with the shaft *d*.

At the rear end of the shaft C the wheel *k* gears with a similar one, *l*, that turns the feeding-screw D. In a box upon the cross-piece 1, under the pinion *i*, is a divided nut, *n*, consisting of two movable halves, provided at their outer sides with lugs, into which the levers *m* are inserted, so that the two parts of the nut *n* may be drawn apart or brought together, to either engage the feeder or release it.

Between the cross-pieces 1 and 2 are the driving-wheels *p*, on shafts *r*, and around them pass the endless chains S that communicate motion to the cutters.

In the lower ends of the shafts *r*, below the cross-piece 2, are cranks Q, to which forked rods *z* are attached, the outer ends of which rods, after passing through holes in the upper edges of the scrapers F, are bent down or otherwise arranged to prevent the scrapers from yielding to pressure from the inside, but allowing them to be lifted, when pressed against from the other side, to pass over pieces of coal or other obstacles. Thus, on their backward motion, the scrapers clear away anything that might obstruct the operation of the machine.

The scrapers are guided by the rods V, attached under the cross-piece 2; and instead of using only one pair, any number of them may be applied.

The cutters B are polygons, and consist each of three plates, *a' b' c'*, the one above the other, of equal dimensions, and are firmly secured to a vertical shaft, with spaces *p'* between them for the ends of the arm *c*. The middle plate, *b'*, has on each of its straight sides two teeth, *d'*, which serve as guides for the chains, and also to clear away the coal that may be left uncut by the larger teeth *n'* on the sides of the upper and lower plates, *a' c'*.

The teeth, formed as shown in Fig. 4, are let into the edges of the plates at the middle of their straight sides, and are secured to them by screws through the projections *o*. The pin 7, at the lower end of the teeth, is inserted in a hole in the plates to prevent side motion.

If power be applied to turn the shaft *d*, the worm propels the feeder, by which the cutters are pushed forward. The beveled wheels turn at the same time the driving-wheels, connected by the endless chains with the cutters, and impart rotary motion to them, while the cranks move the scrapers back and forth. Thus the whole machine is in operation.

In order to withdraw the cutters from the breast of coal-bank, after having penetrated to a sufficient depth, the levers are applied to the divided nut, the feeder is released, and the cutters drawn back by a single motion, when to recommence the work the two halves of the nut are brought together again.

Having thus described my invention, I claim—

1. The combination of the scrapers F, rods *v z*, and a crank, Q, and driving-shaft *r*, substantially as shown.

2. The teeth *n'*, having the pins 7 and projections *o*, substantially as set forth.

3. The combination of the plates *a' b' c'*, provided with the cutter-teeth *n'* and the clearer-teeth *d'*, the clearer-teeth being placed in the center, and serving for the operating belts or chains to catch over, substantially as specified.

4. The cutters B, each composed of three polygonal plates of the same dimensions, and secured to one shaft, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 31st day of July, 1878.

JOHN BLYTH.

Witnesses:
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