

G. D. WHITCOMB.
MINING-MACHINE.

No. 172,287.

Patented Jan. 18, 1876.

Fig. 1.

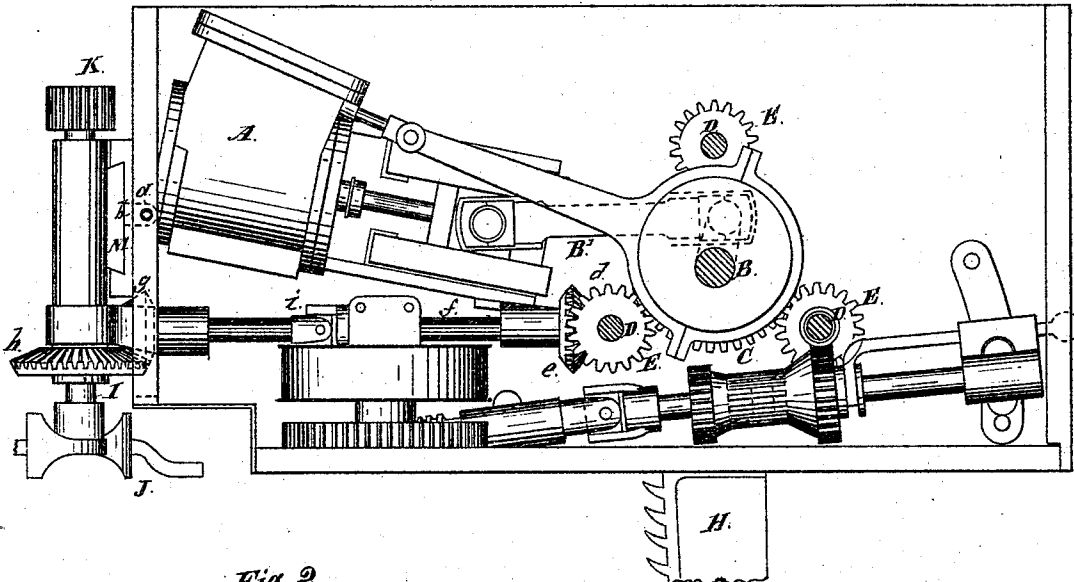


Fig. 2.

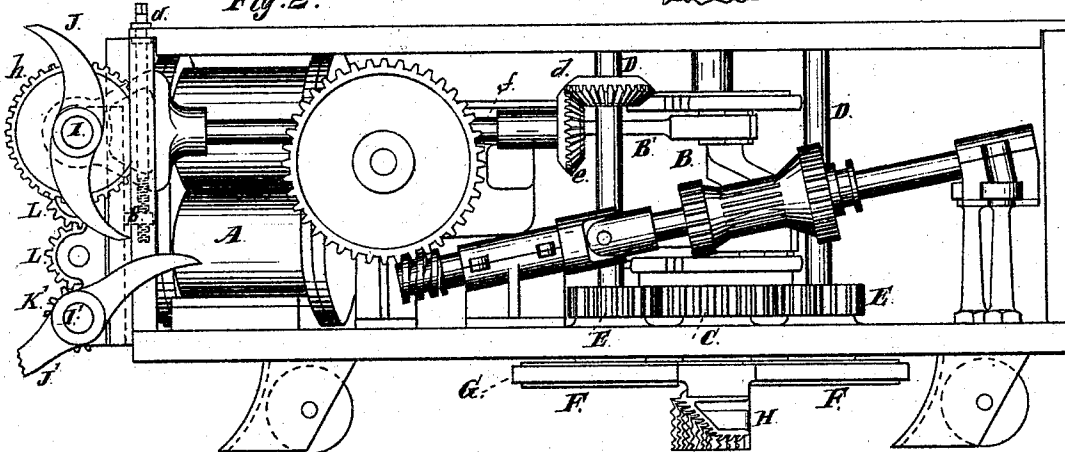


Fig. 3.

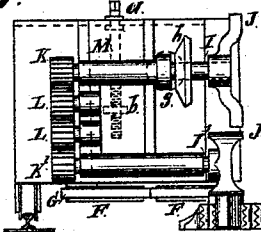


Fig. 4.

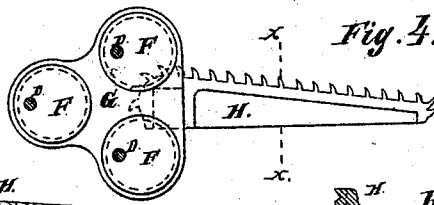


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE D. WHITCOMB, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN MINING-MACHINES.

Specification forming part of Letters Patent No. **172,287**, dated January 18, 1876; application filed December 14, 1875.

To all whom it may concern:

Be it known that I, GEORGE D. WHITCOMB, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Mining-Machines, which is fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of the machine; Fig. 2, a side elevation from the breast side of the machine; Fig. 3, an end elevation on a reduced scale looking from the front of the machine; Fig. 4, a detached view, showing a plan of the cutter and driving-plate to which it is attached, and Fig. 5 a sectional view of the cutter, taken upon the line *x x*, Fig. 4.

The object of my invention is to provide a machine for cutting coal by means of mechanism, moved through galleries of the mine alongside the breast of coal.

The invention consists in an improved construction of the cutter, which forms a channel underneath the breast of coal; also in the mechanism for driving this cutter, consisting of eccentrics working in a plate to which the cutter is attached, and also in trimming-cutters for dressing the breast in advance of the machine.

In the drawings, A is an engine, supported upon a suitable carriage-frame provided with wheels, so that it may be run along the galleries of the mine. In this frame is placed an upright crank-shaft, B, which is driven by means of the connecting-rod B', attached in the usual way to the piston-rod of the engine. At the lower end of the crank-shaft is a large gear-wheel, C. Around the crank-shaft B are arranged three upright shafts, D, which extend down through the carrying-frame. Upon these shafts are pinions E, which mesh with the gear-wheel C, and upon the lower ends of the same shafts are placed eccentrics F. These eccentrics are placed within a plate, G, which is provided with suitable holes for this purpose, and is held in position by flanges upon the eccentrics. To the plate G is rigidly attached a cutter, H, which projects from the side of the machine for the purpose of cutting a channel under the coal, on a level with the floor of the chamber. This cutter is of peculiar

construction; its under side is straight, while its upper side is tapered toward the outer end, as seen in Fig. 3. The top of the cutter is also depressed and the bottom raised immediately in rear of the cutting-edge, as shown in Figs. 4 and 5. The front edge of the cutter is provided with teeth arranged in vertical rows, as seen in Fig. 3. At the front end of the machine are placed two shafts, I and I', to the outer ends of which are attached cutting-blades J J', of the form shown in the drawings, and arranged so that the outer plane of their revolution will coincide with the side of the machine next to the breast, and, to accommodate their arrangement, the forward inner corner of the frame is constructed with a rabbet, as shown in Figs. 1 and 3. Upon the outer end of the upper shaft I is placed a pinion, K, and a corresponding pinion, K', upon the outer end of the lower shaft I', the two being connected by suitable pinions L L. This entire arrangement of shaft, cutters, and pinions, is supported by a secondary sliding frame, M, which may be adjusted by means of a setting-shaft, *a*, the lower end of which is provided with a screw-thread, and works in a screw-plate, *b*, attached to the sliding frame. Upon one of the shafts D is placed a bevel-pinion, *d*, which meshes with a corresponding pinion, *e*, upon a shaft, *f*, extending forward to the front end of the machine, where it is provided with a second bevel-pinion, *g*, which meshes with a bevel-wheel, *h*, upon the shaft I. The shaft *f* is in two pieces, connected by a convenient joint at *i*, so that it may accommodate itself to the movement of the sliding frame in front of the machine.

The operation of my machine is as follows:

The engine being put in motion, the shafts D are revolved by means of the crank-shaft and gearing A B C meshing with the pinion E, and a peculiar reciprocating motion is communicated to the channeler by means of the eccentrics F revolving in the plate G. At the same time motion is communicated from the pinion *d* by a tumbling-shaft, *f*, and gearing on the shaft I I', to the trimming-cutters J J. The machine is provided with a suitable feeding mechanism, which may be adjusted so as to regulate the forward motion of the machine according to the hardness of the coal,

The channel-cutter being tapering and very thin, except at the cutting-edge, all binding is prevented, and by the action of the eccentric driving mechanism each tooth is made to traverse a circular path, which I have found successfully cleans the channel as it is cut. The rotary cutters at the forward end of the machine will dress the breast from the top to the bottom, so that no obstacle will be presented to the progress of the machine at a uniform distance from the wall. These cutters may also be adjusted by means of the sliding frame M, so that the lower one will follow exactly the contour of the gallery-floor, and cut a smooth track for the inside wheels of the machine, thus obviating the necessity of any rail except the outside one, and also so adjust the angle or cross-line of the machine as to conform to the dip of the coal, or mineral, and prevent a cross-section bind or clogging of the cutting-tool. The cutter-plate may be driven by three, or more or less, eccentrics or cranks.

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

1. The cutter or channeler H, constructed substantially as described.

2. The combination, substantially as described, of the eccentrics F, and the plate G, as and for the purposes set forth.

3. The combination, substantially as described, of the eccentrics, driving-plate, and cutter attached to the latter, as and for the purposes set forth.

4. The trimming-cutters J J, substantially as and for the purposes described.

5. The combination, substantially as described, of the trimmers J J', and a sliding frame, M, as and for the purposes set forth.

6. The cutting-teeth of the channeler H, arranged in vertical rows and subdivided horizontally, so that they will more readily clear themselves and increase the cutting capacity, as shown.

7. In a mining-machine the combination, substantially as described, of the trimming-cutters and a laterally-projecting channel-cutter, as and for the purposes set forth.

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Witnesses:

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