C. L. DRIESSLEIN.

COAL-MINING MACHINE.

No. 187,752. Patented Feb. 27, 1877.

Fig. 1.

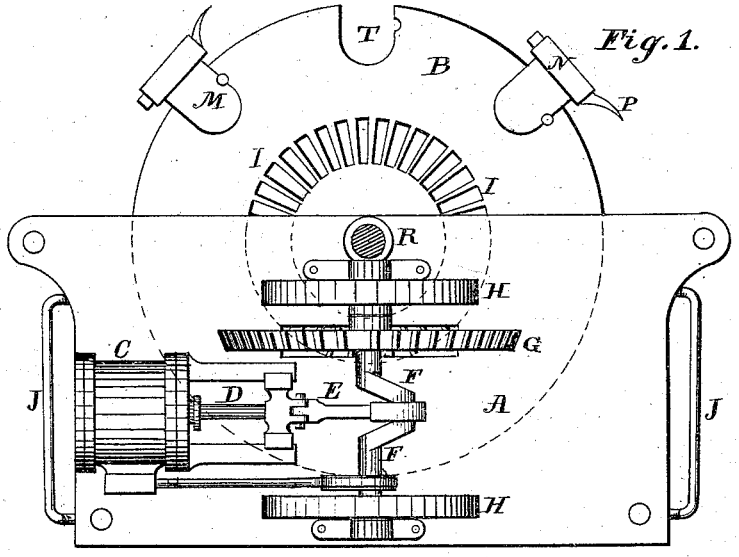


Fig. 3

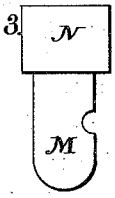


Fig. 2.

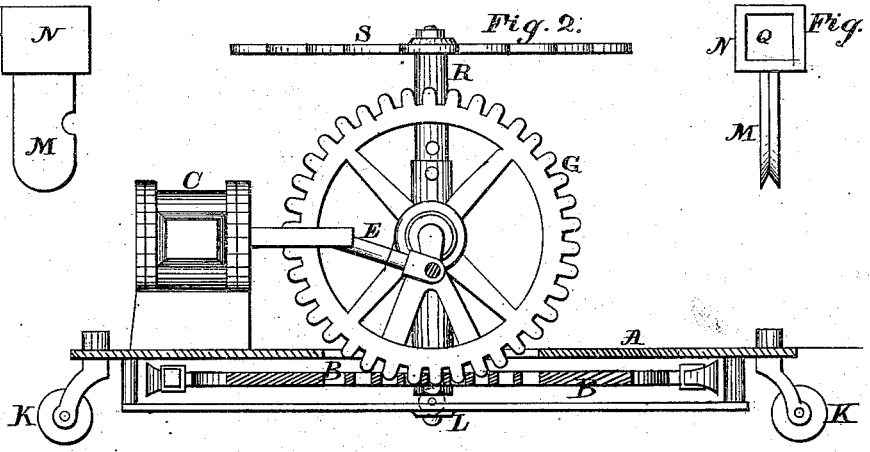


Fig. 4.

Fig. 5.

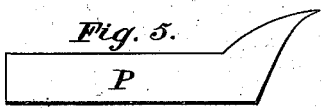
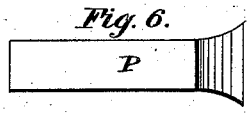


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES L. DRIESSLEIN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN COAL-MINING MACHINES.

Specification forming part of Letters Patent No. **187,752**, dated February 27, 1877; application filed October 17, 1876.

To all whom it may concern:

Be it known that I, CHARLES L. DRIESSLEIN, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Mining Coal, Quarrying or Channeling Clay, and the like; and that the following specification, with the drawings referred to therein, constitutes a full, clear, exact, and sufficient description of my said invention, and of the principal modes in which I contemplate its application.

The nature of my invention consists in a certain construction, combination, and arrangement of parts, whereby the mining-machine for which I received Letters Patent of the United States No. 136,712, dated March 11, 1873, is greatly improved, and made capable of performing a much larger amount of work in a more thorough, efficient, and economical manner.

Ever since the issue of my original patent, above referred to, I have been engaged in perfecting the mining and channeling machine therein described, and particularly in devising and rendering convenient, cheap, and practical the most suitable avenues and appliances for the application of the power of compressed air to the driving of the cutter-wheel or saw mentioned in my original specification. I have pursued the use of air as a driving power for the double reason that it aids in the ventilation of the mine, and removes the objection that the use of water as a motor increases the discomfort of the miner while engaged in his work.

In using compressed air as a motor I have sought particularly to guard against the loss of power in the application of the force to the driving of the saw, and have found that by applying the motive power of compressed air to the driving of the cutter-wheel or saw through the avenue, and by the appliance of the cylinder, piston, and pitman of a compressed-air engine, connecting immediately with a cog-wheel gearing into the cog-slots cut in or through a cog-receiving attachment affixed to the cutter-wheel or saw, I secure the most direct and efficient application of the power of compressed air through the proper exit passages or pipes thereof to the cutter-wheel or saw, and thereby also secure the most rapid, thorough, efficient, and satisfactory work.

One great gain by this perfected machinery, which is only a natural and orderly mechanical development of my original invention, as described in my original Letters Patent, is that I secure the greatest results from the least power, and guard against any loss of power in the operation of unnecessary or complicated machinery, and at the same time my machine is lighter, smaller, cheaper, and more easily handled and managed, and more efficient than any other of which I have any knowledge.

I also secure by my new machine the following advantages, viz: The machine can be used in as small a passage-way as can well be worked by hand. It will cut closer to the bottom of the coal-seam than any other known machine, thus securing a saving of more coal than any other. The saw will cut a narrower channel than any other machine, thus wasting less coal in its operation.

The machine can be used on any kind of coal-face, and can be easily adapted to comparatively abrupt changes in the direction of a passage-way. No track or tramway is necessary for the propulsion of the machine.

My coal-saw is propelled with a rapidity and power which increases enormously the capacity of the machine, with a corresponding cheapening of the cost of mining.

My invention of the new and additional improvements above referred to consists, first, in an upward extension of the shaft to which my main cutting-wheel or saw is attached, and which revolves with it, and in attaching to said shaft an additional saw without a cog arrangement for driving the same, so fixed and fastened to said shaft that when the shaft revolves with the main cutter-wheel or saw, the additional saw will be revolved with it and cut a second channel into the coal; second, whereas others have cut sockets in saws and inserted removable teeth therein, I, for the purpose of securing greater economy, strength, and efficiency, construct a separate and independent tooth-supporter, so formed as to fit into the socket cut into the saw.

In this separate and independent tooth-sup-

porter I form, in or near the top thereof, a lateral or horizontal opening, into which the shank or root of the cutting-tooth is inserted from one side or the other at pleasure, the blade or cutting-surface of the tooth being set in the direction in which the saw is to be made to revolve. Thus, if one of the saw-teeth be broken, it can be instantly and conveniently removed without disturbance of or injury to either the saw-plate or the tooth-supporter, and another tooth be inserted in its place. I also gain the additional advantage of relieving the saw-plate from a portion of the strain that would otherwise be exerted upon it were the tooth inserted directly in the saw-plate, my independent tooth-supporter receiving a large part of such strain, and relieving the plate of the saw therefrom.

My said improvement also consists in so constructing an opening in the top of the tooth-supporter and the corresponding shank of the tooth that the tooth may be inserted from either side at pleasure, according to the direction in which it is desired that the saw shall revolve.

The following additional description of my said machine and its particular component parts by reference to the drawing accompanying this specification may enable others whom it may concern the better to understand the nature of my said invention, and, having the lawful authority, to construct and operate the same.

Figure 1 represents my new and improved machine with the upper saw removed. Fig. 2 represents a view of the same machine, as seen from the side, with the upper saw attached. Fig. 3 represents a side view, and Fig. 4 an end view, of my new removable tooth-supporter. Figs. 5 and 6 represent the tooth to be used in the supporter represented in Figs. 3 and 4.

The respective letters in the different figures relate to the same part of the machine in each.

A represents a portable frame, with handles J attached, by which said frame can be easily moved and controlled. This frame rests upon caster-wheels K. In this frame is hung a circular saw, B, having slots or apertures I in its plate, all equally distant from the center of the saw, which receive the teeth of the connecting cog-wheel G, said slots being equivalent to and answering the purpose of a cog-wheel fastened to said saw-plate, or to the shaft to which the saw is attached. Into these slots or apertures the teeth of the cog-wheel G insert, which cog-wheel is upon shaft F, on which shaft are also the fly-wheels H H, and attached to which shaft F is pitman E, which is connected with piston D, entering into cylinder C. Said cog-wheel, fly-wheels, and cylinder are above, and supported on frame A by suitable supports, and immediately above and occupying about one-half of the space or surface of the saw B. The saw B, or rather the shaft thereof, is supported by suitable bearings. Attached to the frame A, below the propelling machinery and saw-plate B, is a friction-roller, L, upon which said saw may find support to keep it steady.

Shaft R in saw B may be made to support another saw, S, at a desirable distance from saw B, and when thus placed the two saws will revolve together, the motion being imparted to the second saw by the first or lower saw through the shaft common to both.

The recesses or sockets T in the saw-plate B are for the insertion of detachable or removable tooth-supporters M N, for holding the cutting-teeth P. The sockets cut in the saw are formed on circular lines, to prevent said saw-plate from cracking or splitting should the teeth meet an unlooked-for and sudden obstruction. Said detachable or removable tooth-supporters M N have their base or bottom parts formed on circular lines to fit the recesses T above mentioned. The top N of said supporters has an open head or an aperture, Q, similar in shape to the shank of the cutting-tooth P, which cutting-teeth may be inserted in the open head Q of the tooth-supporter from either side of the same, to suit the direction in which the saw is to revolve. The letter N denotes the top of the tooth-supporter, with the vertical opening for the tooth therein, and the letter M the bottom of the tooth-supporter, fitting into the socket T, cut in the saw-plate B.

It may also be desirable, in using this machine, to place it on a bed-piece or track, and, by means of cogs, screw, or other well-known gearing attached thereto, or to the frame of the saw, or both, to press forward and hold the saw to its work, instead of controlling its cut simply by hand.

It is evident that by the admission of compressed air into the cylinder C, through suitable pipe and hose, the piston D will be set in motion, and communicate motion through pitman E to the shaft F, revolving the cog-wheel G, which, gearing into the slots I, will produce the revolving of the saw B, which, being attached to shaft R, will give motion to and revolve saw S.

One of the advantages of my mining-machine is, that it is so arranged as to permit of about one-half of the saw entering into or under the seam of coal or substance to be mined or channeled, while the frame for supporting and the machinery for driving the saw take up but little more space than the one-half of the saw outside of the coal.

I have only mentioned coal and clay as the substances to be wrought upon by the saw. It is evident that any and all other mineral or earthy substances may be cut or channeled thereby, as also standing timber may be cut down by using a circular saw suitable for such work.

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

1. The revolving plate B, having recesses T in its outer edge, in combination with the

independent cutter-holders M, constructed with sockets N and the independent cutting-tool P, substantially as described.

2. The revolving cutter B, in combination with the gear-wheel G, fixed on the crank-shaft, and meshing with the cutter-plate, crank-shaft F, and pitman E, arranged and operating substantially as described.

3. The revolving cutter-plate B, in combination with the upright shaft R and upper cutter S, arranged to cut an upper and lower channel simultaneously, substantially as described.

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