(No Model.)

C. L. DRIESSLEIN.

COAL MINING MACHINE.

No. 245,798. Patented Aug. 16, 1881.

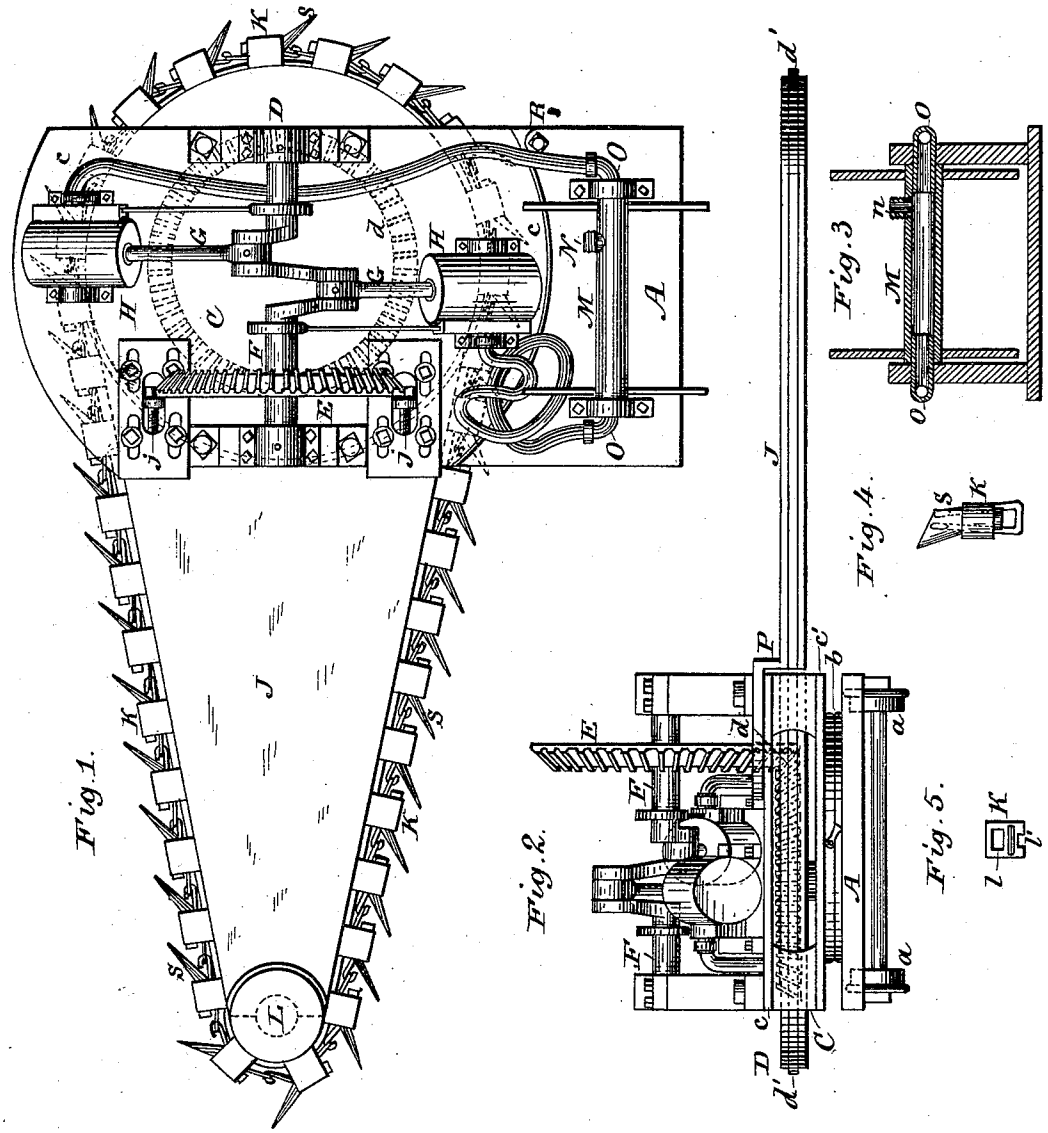


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 245,798, dated August 16, 1881.

Application filed January 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. DRIESSLEIN, of Maywood, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Mining Coal; and I do hereby declare that the following specification, with the drawings referred to therein, constitute a full, clear, exact, and sufficient description of my said invention and the mode in which I contemplate its application.

The nature of my invention consists in a certain construction, combination, and arrangement of parts whereby the mining-machines for which I received Letters Patent of the United States No. 136,712, dated March 11, 1873, and No. 187,752, dated February 27, 1877, are greatly improved, and made capable of cutting a much deeper channel in strata of coal than I have been able heretofore to accomplish.

Heretofore coal-mining machines have been provided with an endless band carrying cutters, and said band has been made to pass around the end of an arm mounted upon a turn-table secured to a carriage and advanced thereby. The central shaft of pump and fire-engine reels has also been made hollow for water to circulate therethrough from the source of supply to the end of the hose. Therefore my invention does not consist, broadly, in such devices; but it will be hereinafter described in connection with the drawings, and then pointed out in the claims.

Figure 1 represents a top view of the machine. Fig. 2 represents a side elevation of the same, with the cutting-chain removed. Fig. 3 represents a vertical section of the hose-reel. Fig. 4 represents a top view of the knife-holder. Fig. 5 represents an end view of the knife-holder, showing the socket for holding the knife or cutter, and also the groove in its base.

The respective letters in the different figures relate to the same part of the machine, in which—

A represents a portable frame, resting upon wheels *a*, which run on a track. This frame A has attached to it on its top, and supports, a turn-table, *b*, made in any well-known manner, and on this turn-table rests the frame C, having an upper, *c*, and a lower, *c'*, flooring. In this frame C is hung the chain-wheel D, which has attached to its upper surface a gear-wheel, *d*, whose cogs receive the teeth of the connecting gear-wheel E, which gear-wheel is upon shaft F, and attached to shaft F are the pistons G, entering into cylinders H. Said gear-wheel E and cylinders, with their accompanying parts, are above and supported on the upper flooring, *c*, of the frame C by suitable supports, and are immediately above the chain-wheel D. An open place in the upper flooring, *c*, permits of the meshing of the gear-wheels E and *d*. The chain-wheel D is supported by suitable bearings. The chain-wheel D has on its outer edge a raised rail, *d'*, which rail supports and assists in keeping the cutting-chain in place around the edge of the chain-wheel.

Attached to the upper flooring, *c*, of the frame C is an extension-jib, J, for extending the cutting-chain into the channel being cut by the cutting-chain. It is attached in such a manner that by means of set-screws *j* this extension-jib may be extended slightly, so as to make taut the cutting-chain when necessary. The extreme end of this extension-jib carries and terminates in a small wheel, L, which, as the cutting-chain passes around it, facilitates the movement of the cutting-chain. This extension-jib has also on its edge a raised rail, *d'*, which supports and assists in keeping the cutting-chain in place on the edge of the extension-jib. As the extension-jib is fastened to frame C above the chain-wheel D, and as it is necessary that the raised rail *d'* on the edge of the chain-wheel D and on the edge of the extension-jib J should be on a direct line, so as to carry the cutting-chain in a straight line, the outer part of the extension-jib is brought to the same plane with the chain-wheel by bending said jib at right angles to itself in two places, thereby producing a step, as it were, in said extension-jib, such step being immediately outside of the frame C, as shown in Fig. 2 at P.

The cutting or channeling of the coal is accomplished by means of the revolving of an endless chain, having knife-holders K attached to the links of the chain, said holders being furnished with sockets *l* for the reception of the knives or cutters S. Said cutting-chain rests on the periphery of the chain-wheel D, and extends thence around the edge of the extension-jib J. The links of this chain are made

of iron or steel wire of suitable strength, bent into an oblong loop, one end of the loop being made a little narrower than the other end, and this narrower end is curved upward, thereby forming a hook, and this hook hooks into the wider end of the loop of the next link in the chain. On these wire links the cutter-holders K are cast, preferably of malleable iron, in such manner that the wire links are embedded in the casting, yet extending out beyond the casting on each side. The top of this cutter-holder K has an opening or aperture, *l*, similar in shape to the shank of the knife or cutter S, (which cutters are more fully described in Letters Patent No. 187,752,) which cutters may be inserted in the sockets *l* from either side of the same, to suit the direction in which the chain is to revolve; and the bottom surface of the cutter-holder K has a recess, *l'*, in its center, of a shape to fit the raised rail *d'* on the edges of the chain-wheel and extension-jib.

On one end of the frame A is placed a hose-reel for carrying a portion of the hose used in conveying the compressed air from the stationary pipes introduced into the mine to the cylinders of the mining-machine. This reel is made with a hollow axle, M, said axle, having a nozzle, N, on its surface for the attachment of the hose coming from the stationary pipes, and which nozzle forms the entrance-passage for the compressed air into the hollow axle; and pipes O, placed in each end of this hollow axle and forming a part of the axle, with their inner ends open and their outer ends having a nozzle for the attachment of the hose conveying the compressed air direct to the cylinders, furnish the exit-passages from the hollow cylinder, which pipes O form the trunnions or axles upon which said reel, with its hollow axle, rests in its bearings and supports. Pipes O are inserted in the hollow axle M by suitable bushing, permitting said hollow axle to revolve on the inner ends of the pipes O, which pipes rest stationary in their bearings. This hose-reel, with its supports, can be made to swing out of the way on pivot R when it is desired to withdraw the extension-jib from the coal and place it on the carriage. It is obvious that by the use of this reel only so much hose will need to be unreeled as is the distance of the mining-machine from the stationary pipes to which said hose is attached, and the compressed air passes from the stationary pipes through the hose into the hollow axle, and thence through the pipes O forming the trunnions or axle of the reel to the shorter hose, conveying it to the cylinders.

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

It is evident that by the admission of compressed air or other motor into the cylinders H through suitable pipe and hose, the piston G will be set in motion and communicate motion to the shaft F, revolving the gear-wheel E, which, gearing into the gear-wheel *d*, will produce the revolving of the chain-wheel D, which will carry around with it the cutting-chain.

One of the advantages of my mining-machine is that it is so arranged that the frame C, to which the extension-jib J is attached, can be turned by a lever or other appliance on the turn-table *b*, so as to bring the extension-jib parallel with the track on which the machine is placed until such time as the cutting-chain cuts a channel in the coal to permit of the extension-jib and its attendant cutting-chain to enter the coal, and when the machine is fairly at work the extension-jib will stand at right angles to the track. Consequently the machine will occupy but little more space when the extension-jib is not inserted in the coal than it does when the extension-jib is inserted.

Another advantage my mining-machine has is that when the cutting-chain meets with an obstruction in the coal the forward pressure of the extension-jib can be eased up by partially turning of the machine on the turn-table without stopping the revolving motion of the cutting-chain until such obstruction is passed.

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

1. The combination of the chain-wheel D, having upon its periphery a central projecting band, *d'*, with cutter-holders K, having socket *l*, groove *l'* in the inner side thereof, and wire chain-links passing through said holders, and independent cutting-tool S, substantially as described.

2. The combination of the frame C, having an upper and lower flooring, *c c'*, and chain-wheel D, placed between them, with extension-jib J, having the step P and slotted plates at its inner end, and adjusting-screws *j*, attached to said frame C, substantially as shown and described.

3. The combination of two oscillating cylinders, H, and double-crank shaft F, with gear-wheel E, secured upon said crank-shaft, crown gear-wheel *d* meshing therewith, and chain-wheel D, substantially as and for the purpose described.

4. The combination of the frame C and cylinders H thereon with the hollow hose-reel, having each end connected by a pipe with said cylinders, and a pipe-coupling, N, between said ends, substantially as and for the purpose described.

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