(No Model.) 2 Sheets—Sheet 1.

E. MOSER.

MACHINE FOR DRILLING AND CUTTING COAL.

No. 389,402. Patented Sept. 11, 1888.

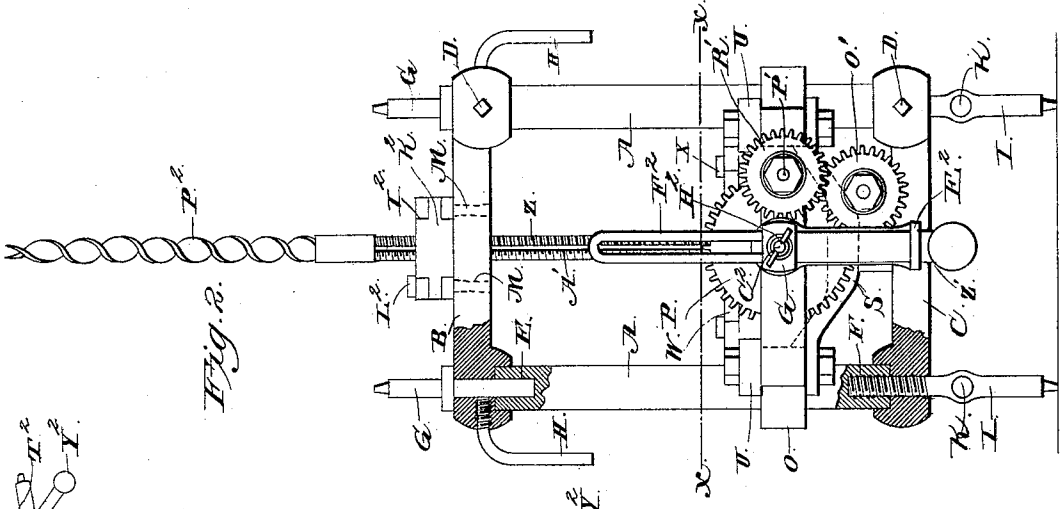


Fig. 2.

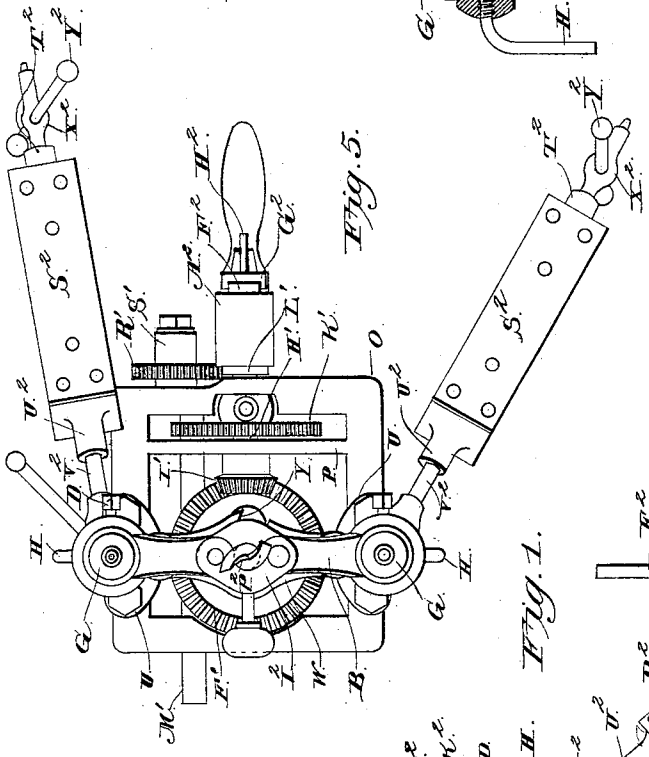


Fig. 5.

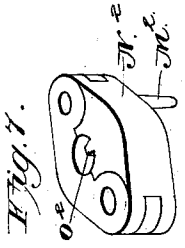


Fig. 7.

Fig. 1.

Witnesses

M. Fowler

Jno. Garner

Inventor

Edmund Moser

By his Attorneys

C. A. Snow & Co.

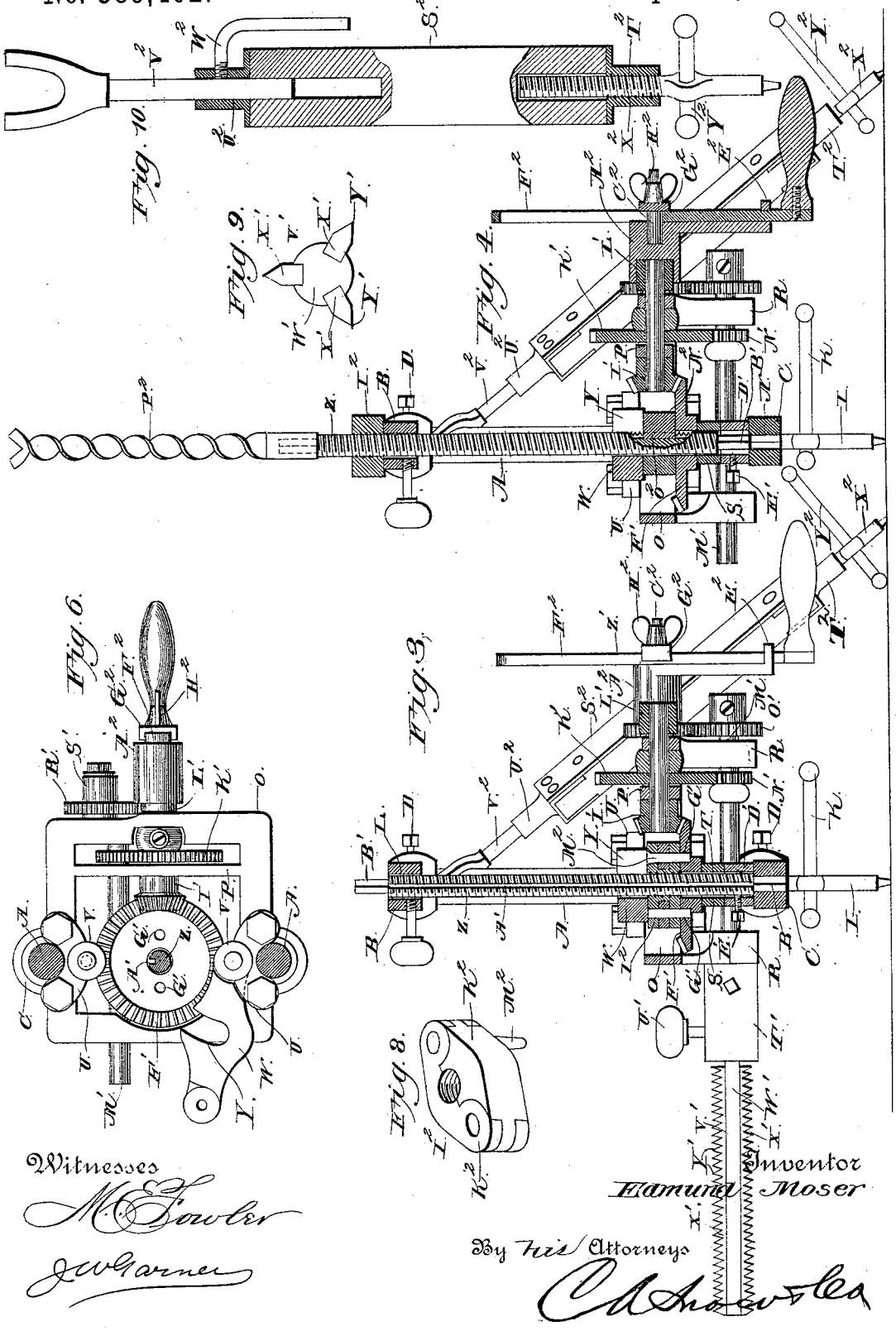
N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

E. MOSER.

MACHINE FOR DRILLING AND CUTTING COAL.

No. 389,402. Patented Sept. 11, 1888.



Witnesses
M. Fowler
J. W. Garner

Inventor
Eamund Moser
By his Attorneys
C. A. Snow & Co.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

EDMUND MOSER, OF PITTSBURG, KANSAS.

MACHINE FOR DRILLING AND CUTTING COAL.

SPECIFICATION forming part of Letters Patent No. 389,402, dated September 11, 1888.

Application filed February 11, 1888. Serial No. 263,667. (No model.)

To all whom it may concern:

Be it known that I, EDMUND MOSER, a citizen of the United States, residing at Pittsburg, in the county of Crawford and State of Kansas, have invented a new and useful Improvement in Machines for Drilling and Cutting Coal, of which the following is a specification.

My invention relates to an improvement in machines for drilling, mining, and cutting coal; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a coal mining and drilling machine embodying my improvement. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical central sectional view of my invention when adapted for use in cutting and mining coal. Fig. 4 is a similar view of the same when adapted for drilling. Fig. 5 is a top plan view. Fig. 6 is a horizontal section taken on the line *x x* of Fig. 2. Fig. 7 is a detail view of the block N^2. Fig. 8 is a similar view of the block I^2. Fig. 9 is an end view of the cutter. Fig. 10 is a detail sectional view of one of the braces.

A represents a pair of vertical standards, which are cylindrical in shape, and are preferably made of iron or steel. The upper and lower ends of said standards are connected by transverse bars B C, respectively, which transverse bars have sockets in their ends to receive the ends of the standards, and are provided with set-screws D, to clamp them firmly to the ends of the standards.

In the upper ends of the standards A are central bores or openings, E, of suitable length, and the upper cross-bar, B, is provided in its upper side with openings, which register with said bores or openings E. In the lower ends of said standards A are similar bores or openings, F, which register with openings in the lower cross-bar, C. The said openings F are provided with screw-threads.

G represents a pair of extensions, which are arranged in the upper openings or bores, E, are adapted to be moved endwise in the same, and are clamped and secured in place in the bores E at any desired adjustment by means of set-screws H.

I represents a pair of extensions which have their upper portions threaded and screwed in the threaded openings F in the lower ends of the standards, and said screw-extensions I are provided with transverse handles or bars K, which pass through openings therein and enable the same to be readily turned. By means of these sliding extensions G and screw-extensions I the main frame of the machine, comprising the standards A and the cross-bars B and C, may be secured in any desired position in the gallery of a mine, as will be readily understood by persons skilled in this art. The upper cross-bar, B, is provided with a central cylindrical opening, L, and on opposite sides of the said opening L are smaller openings, M. The lower cross-bar, C, has a central rectangular opening, N.

O represents a rectangular sliding frame, which is provided in opposite sides with a pair of openings through which the standards A extend, and thereby the said frame is secured in the main frame and is adapted to slide therein. Near the outer side of the frame O is a cross-bar, P, and from the front and rear sides of said frame O depends a pair of brackets or hangers, R, which are arranged in line with each other and at a suitable distance from the center of frame O.

S represents a transverse bar, which has its ends bolted to the under side of the frame O and is arranged in line with the standards A. The said bar is curved or bent, so as to make its central portion lower than its ends, and in the central portion of the said bar is a plane cylindrical opening, T, which is in line with the openings L M in the upper and lower cross-bars, B C.

On the upper side of the frame O, and in line with the standards A, is bolted a pair of brackets, U, which brackets are provided with inwardly-extending pairs of ears V.

W represents a bridge-block, which has one end pivoted between the ears of one of the brackets U and has its opposite end reduced and adapted to pass between the ears of the opposing bracket. A pin, X, is adapted to be inserted through an opening in the free end of the bridge-block W and through registered openings in the ears of the bracket, with which the free end engages, so as to secure the said bridge-block in a transverse position in line with the bars B C, or enable the same to be

swung on its pivot, for the purpose to be hereinafter described. In the center of the bridge-block is an open slot, Y, which is curved slightly, as shown, and is drawn from the center of the pivotal bolt of the bridge-block.

Z represents a screw of suitable length, which is of sufficient diameter to enable it to slip freely through the opening L in cross-bar B, is provided with a longitudinal groove, A′, and has its upper and lower ends reduced to form square projections B′. The square projection at the lower end of the screw is adapted to fit in the square opening N in the center of the lower cross-bar, C. The lower portion of the said screw passes freely through the central opening in the cross-bar S.

D′ represents a collar, which is secured to the screw, near the rear end thereof, by means of a set-screw, E′. The said collar bears against the under side of the transverse bar S and prevents the screw from moving upward through said bar.

F′ represents a beveled gear-wheel, which is provided with a plane central opening, through which the screw extends, so that the said beveled wheel may rotate loosely on the screw, and said bevel-wheel rests upon the upper side of the cross-bar S, and is provided, on opposite sides of the central opening, with openings G′.

H′ represents a shaft, which is journaled in the front side of the frame O and in the cross-bar P. The said shaft has a miter-pinion, I′, at its inner end, which engages the wheel F′.

K′ represents a large spur-wheel, which is secured to the shaft H′ and is arranged between the front side of frame A and the cross-bar P. To the outer end of shaft H′ is screwed a sleeve, L′, for the purpose to be hereinafter described.

M′ represents a shaft, which is journaled in the brackets or hangers R, is provided with a spur-pinion, N′, which meshes with spur-wheel K′, and has at its front end a larger spur-wheel, O′. From the outer side of the frame O projects a spindle, P′, on which is journaled a spur-wheel, R′, which meshes with the spur-wheel O′ and has a sleeve, S′, of the same diameter as the sleeve L′. To the end of the shaft M′ which projects beyond the rear side of the frame is secured a cylindrical socket, T′, by means of a set-screw, U′.

V′ represents a cutter, which comprises a bar or shaft, W′, having three longitudinal cutting-blades, X′, that radiate therefrom, said cutting-blades having their outer edges beveled on one side and provided with serrated teeth Y′. The inner end of the shaft or bar W′ of this cutter is adapted to be inserted in the outer end of the socket or sleeve T′, and is secured therein by means of a set-screw, Y′.

Z′ represents a crank, which is provided at one end with a sleeve, A^2, that is adapted to be fitted on either the sleeve L′ or the sleeve S′, and is provided with a set-screw, B^2, by means of which it may be clamped in position to either of said sleeves. From the outer side of the socket A^2 projects a spindle, C^2, the outer end of which is threaded. The outer end of the crank-arm is turned outward at right angles and provided with a transverse slot, thereby forming a guide, E^2.

F^2 represents a slotted extension-arm, which passes through the guide E^2, and the slot of which engages the stud C^2 and is adapted to slide thereon. A clamping-plate, G^2, fits on the outer side of the extension-arm F^2 and is engaged by a thumb-nut, H^2, on the screw-spindle C^2. The function of the said clamping-plate and thumb-nut is to secure the arm F^2 at any desired longitudinal adjustment on the crank-arm. The outer end of said arm F^2 has a crank-handle, H^2.

By the construction hereinbefore described the crank is adapted to be lengthened or shortened, in order to give the operator any desired leverage on the machine. When the crank is attached to the sleeve L′ of shaft H′ and is operated, the rotary motion of said shaft communicates motion to the wheel F′ by means of the miter-pinion I′. When the said crank is attached to the sleeve S′, it communicates motion to the wheel F′ through the gears R′ P′, spur-pinion N′, gear-wheel K′, and miter-pinion I′. Owing to the fact that the pinion N′ is much smaller than the wheel K′ when the crank is attached to said sleeve S′ and rotated, the rotation of the beveled wheel F′ is much slower than when the crank is attached to the sleeve L′. By reason of the gear-pinion N′, which meshes with the spur-wheel K′, the shaft M′ is always rotated, no matter whether the crank is attached to the spindle L′ or spindle S′.

I^2 represents a box, which is made of two sections, K^2, hinged together at one end, as shown, and is provided at the opposite end with a pin, L^2, to secure the said sections together. A threaded opening is made in the center of the box in the opposing sides of the sections, and is adapted to engage the threads of the screw Z. This box is provided on its under side with a depending pin, M^2, which is adapted to enter either of the openings M of cross-bar B or the openings G′ of the beveled wheel F′.

N^2 represents a similar box, which is made in two sections hinged together and having a pin to engage aligned openings in their free ends and secure them together. The said box is provided with a plane central opening, and has a spline, O^2, which is adapted to enter the groove in the screw Z. The pin which depends from the said box N^2 is also adapted to enter the openings G′ in wheel F′.

P^2 represents a drill-bit which has a socket at its inner end adapted to be secured on the squared upper end of the screw Z.

R^2 represents a brace which is adapted to be used to support the main frame under certain conditions when the drilling-machine is arranged in an inclined or other position. The said brace comprises a central main portion, S^2, having a screw-socket, T^2, at one end and a plane socket, U^2, at the opposite end. A sliding extension-rod, V^2, has its inner end ar-

ranged in the socket U^2 and in the bore of part S^2, which communicates therewith. The said extension has its outer end bifurcated, and thereby adapted to engage one of the standards A of the machine-frame, and a screw, W^2, works in a threaded opening in one side of socket U^2, and is adapted to impinge against the rod V^2 and secure the same at any desired longitudinal adjustment.

X^2 represents a screw-extension, the upper end of which engages the threaded opening in the socket T^2. Said extension has a lever or handle, Y^2, fitted in a transverse central opening, by means of which the extension may be turned, and thereby cause the wheel to be extended from or withdrawn into socket T^2.

The operation of my invention is as follows: When the machine is to be used for cutting and mining, the box I^2 is secured to the beveled wheel F' and its sections closed together on the screw Z, so that the latter will engage the threaded openings formed between the sections of the said box. In order to apply the latter to the wheel F' and to the screw, it is necessary to first withdraw the pin from the free end of the bridge W and swing the latter to one side out of the way, the open slot in said bridge, through which the screw Z extends, enabling the bridge to be swung clear of this screw. The crank is then attached to the sleeve S' and rotated, thereby causing the shaft M', having the cutter, to rotate, so that the said cutter is caused to cut its way through the coal, and by reason of the box I' being secured to wheel F', having its threaded opening engaged with screw Z and bearing under the bridge-block W, the rotation of said beveled wheel causes the frame O, carrying the gearing, to be moved up or down on the standards A by reason of the box I^2 revolving with said wheel F' and engaging the threads of the screw Z, as will be readily understood. As the frame O thus moves on the main frame, it feeds the revolving cutter to the coal and keeps the same constantly at work.

When it is desired to use the machine for drilling, the cutter and its socket are removed from the shaft M'. The box I^2 is secured on the upper side of cross-bar B, and its threaded opening also engages with the upper portion of screw Z. The drill-bit is secured on the upper end of said screw, and the box O^2 is secured on the wheel F', the spline of said box being caused to engage the groove in the screw Z. The crank is removed from the spindle or sleeve S' and secured to the sleeve L', and when the same is rotated the rotary motion imparted to the wheel F' by the gearing hereinbefore described is communicated to the box O^2, and as the latter revolves its spline, by being in engagement with the screw Z, causes the latter to rotate and thereby operate the drill-bit, as will be readily understood. The box I^2 on the upper side of cross-bar B, by engaging the threads of the screw Z, causes the latter as it rotates to move lengthwise through the said box and thereby feed the drill-bit to the bore which it is making.

Having thus described my invention, I claim—

1. The combination of the main frame, the movable frame O, guided thereon, the shaft M', journaled in frame O at right angles to the path thereof and adapted for the attachment of the cutter, the revoluble screw loosely journaled in frame O and in the main frame and adapted for the attachment of the drill-bit, the gear-wheel F', loose on said screw, means to secure the latter against rotation, and gearing connecting with gear-wheel F' and the shaft M', substantially as described.

2. The combination of the main frame having the cross-bars B C, provided with the circular opening L and angular opening N, respectively, the movable frame O, guided on the main frame, the shaft M', journaled in frame O and adapted for the attachment of the cutter, the driving-gear K', journaled in frame O, connections between said gear and shaft M', the screw Z, having one end adapted to enter opening N, journaled loosely in frame O and in the main frame and adapted for the attachment of the drill-bit, the gear F', loose on said screw, the device to feather said gear to the said screw, the device to engage the thread of the latter with the main frame, and the connections between gear K' and gear F', substantially as described.

3. The combination of the main frame, the frame O thereon, the shaft M', journaled in frame O and having the gear-pinion N' and larger gear, O', the gear-wheel R', journaled to frame O, meshing with gear O', and having the sleeve S', the beveled gear F', journaled on frame O, the shaft M', at right angles to said gear and having the sleeve L', the spur-wheel K', rigid on shaft M' and meshing with pinion N', the miter-pinion on shaft M', meshing with wheel F', and the crank adapted to be connected to either sleeve, S' or L', substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

EDMUND MOSER.

Witnesses:
MAT HAMILTON,
JOSEPH NIEGSEH.