No. 746,727. PATENTED DEC. 15, 1903.

S. N. MIGHELL.

MINING MACHINE.

APPLICATION FILED MAY 29, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

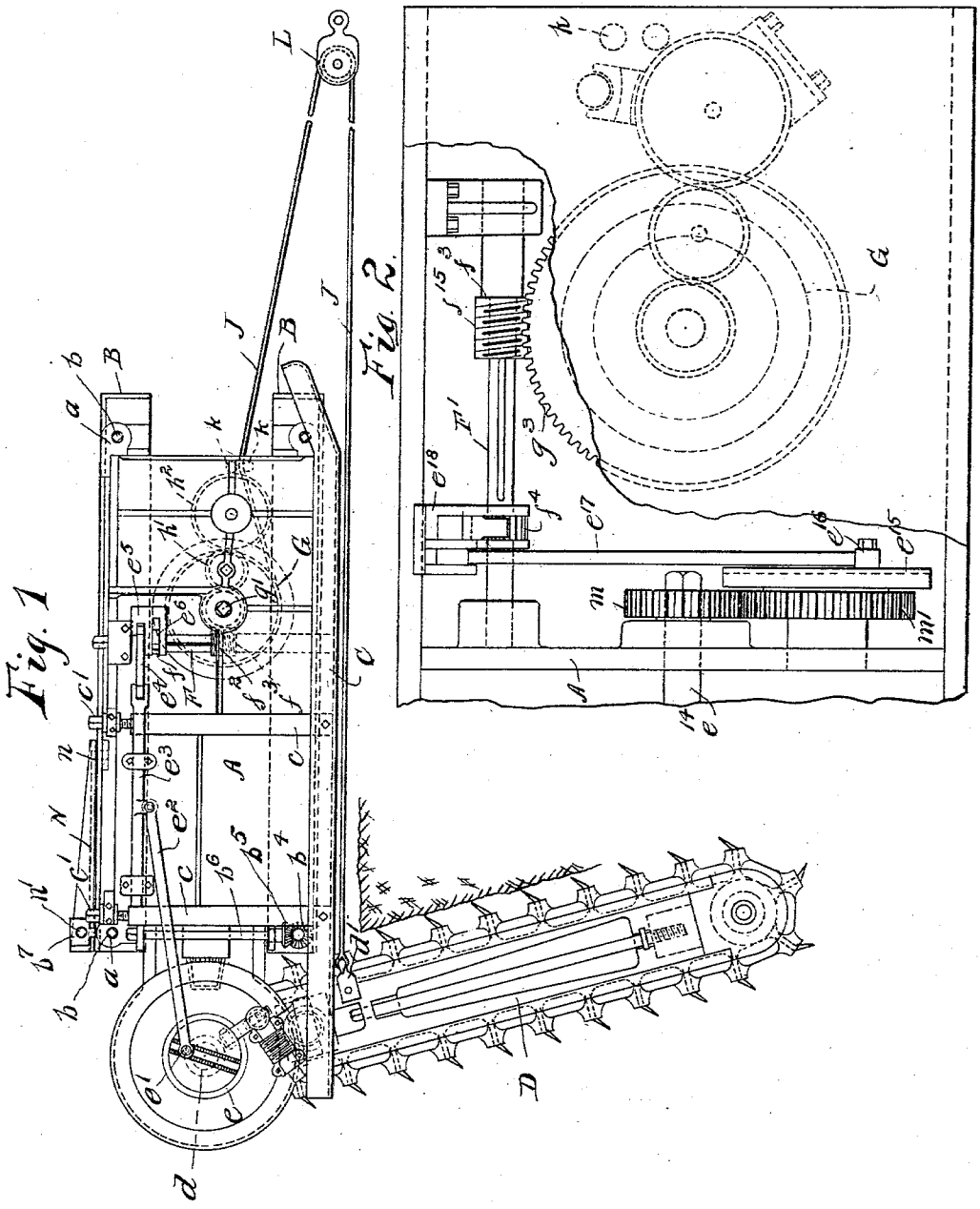


Fig. 1

Fig. 2.

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By Glenn S. Noble

Att'y

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL.

Fig. 3.

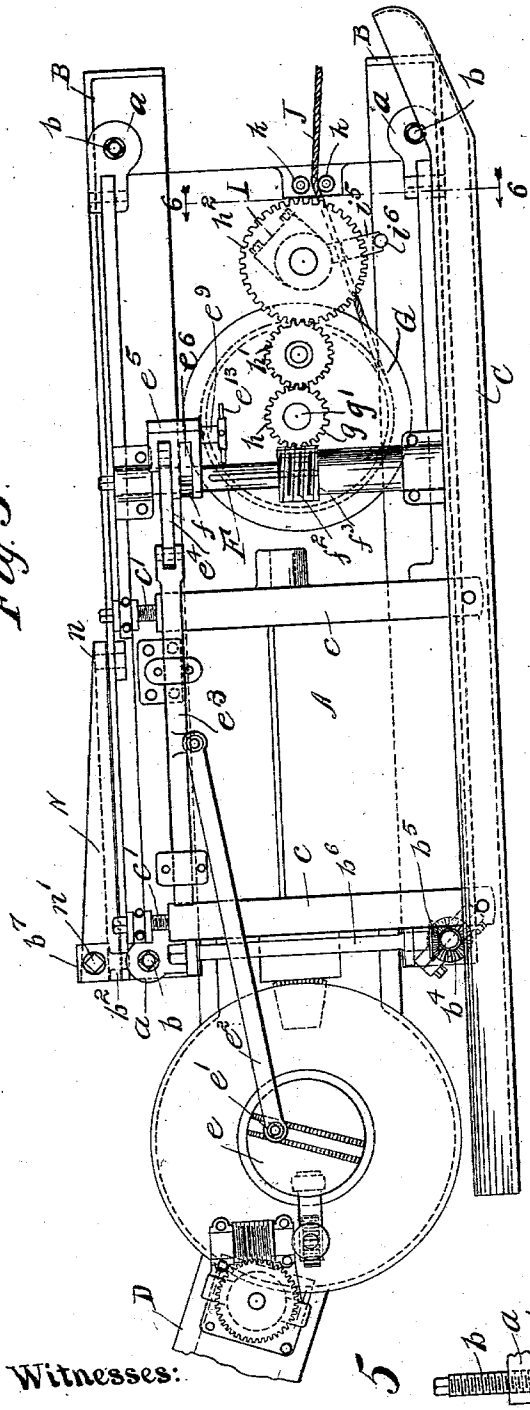


Fig. 4.

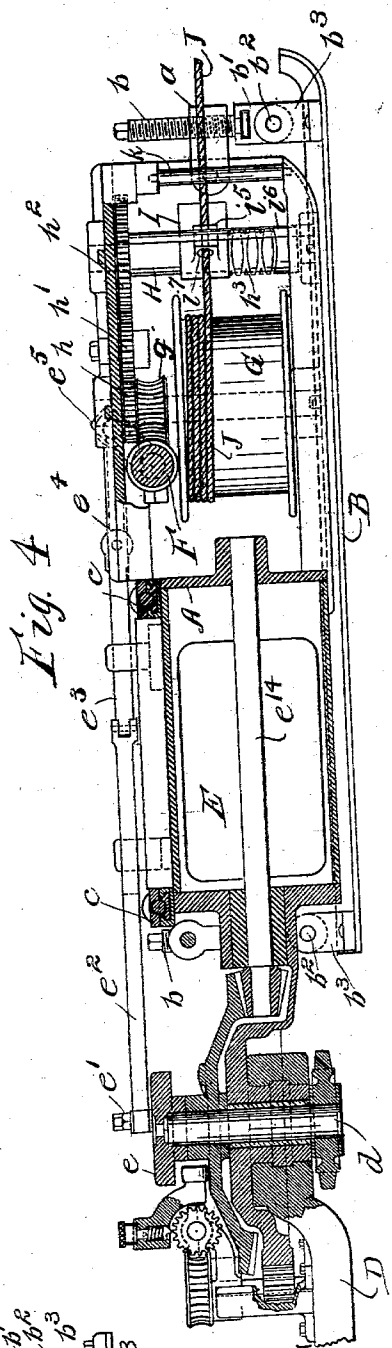
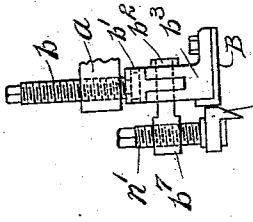


Fig. 5.



Witnesses:

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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 6

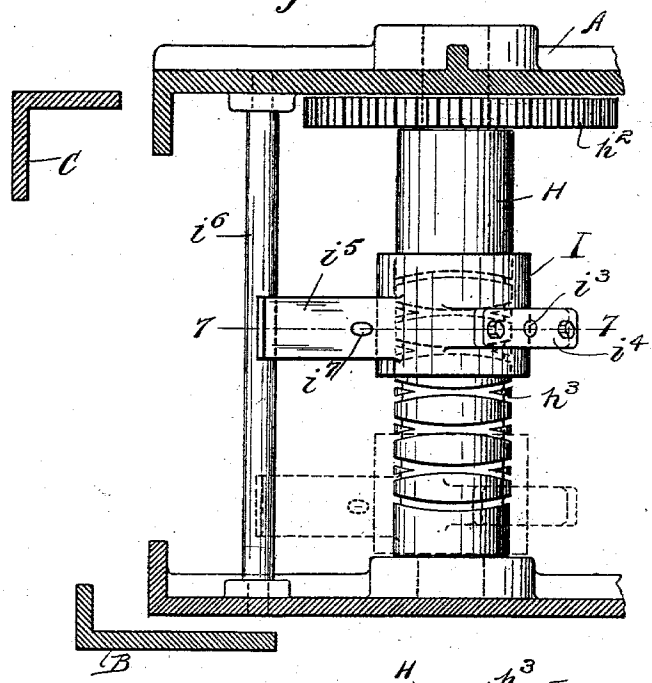


Fig. 9

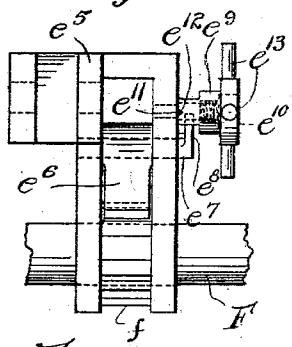


Fig. 10.

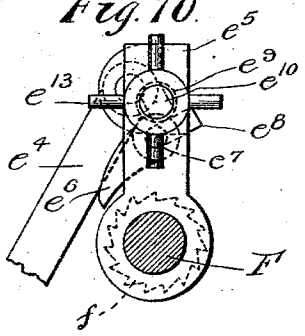


Fig. 7

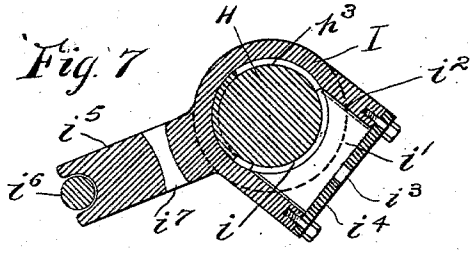


Fig. 11

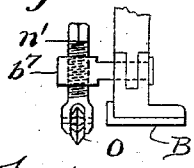


Fig. 10a.

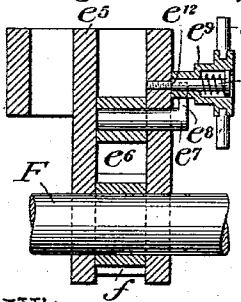


Fig. 8

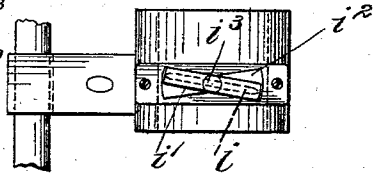
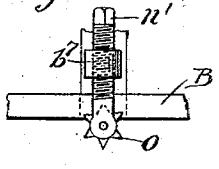


Fig. 12



Witnesses:

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Inventor

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 746,727. Patented December 15, 1903.

UNITED STATES PATENT OFFICE.

SEWARD N. MIGHELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO MORGAN-GARDNER ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 746,727, dated December 15, 1903.

Application filed May 29, 1902. Serial No. 109,543. (No model.)

To all whom it may concern:

Be it known that I, SEWARD N. MIGHELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mining-Machines, of which the following is a specification.

This invention relates more particularly to that class of machines, such as long-wall chain-machines, which are drawn forward and held to work by means of a cable.

It consists in the various features and details that will be described and claimed hereinafter.

In machines of this nature, which are provided with winding-drums for the cable, it is exceedingly difficult to insure the proper winding of the cable, and it is also objectionable to have the cable pulling at various angles to the machine due to the travel back and forth in winding on the drum.

One of the principal objects of the present invention is to overcome these objectionable features and provide a simple and efficient means for insuring the proper winding of the cable and a uniform line of stress for the same.

In the drawings, Figure 1 is a plan view of a machine embodying this invention shown with the cutter-chain bar swung round for the regular cut and with the cable in operative position. Fig. 2 is an enlarged plan view showing a modified form of winding mechanism. Fig. 3 is an enlarged plan view with parts broken away or removed. Fig. 4 is a longitudinal sectional view through the machine. Fig. 5 is a detail showing an end view of one of the runners with an adjustable blade for holding the machine in alinement. Fig. 6 is a sectional view on the line 6 6 of Fig. 3, showing the cable-feeding device. Fig. 7 is a sectional view on line 7 7 of Fig. 6. Fig. 8 is a detail of the traveler on the cable-feed. Fig. 9 is a detail of the feeding-ratchet. Fig. 10 is an end view of the same. Fig. 10^a is a sectional view longitudinally through the pin e^{10} of the feeding-ratchet. Figs. 11 and 12 show a star-wheel, which may be substituted for the blade for holding the machine in alinement.

A represents a suitable frame, which is carried on adjustable runners B. At each corner of the frame is a threaded bracket a, through which is a screw b, provided with a swivel-head b', pivotally secured by a pin b^2 to a bearing b^3 on the runner. At three corners of the machine these screws are squared at the top for engagement with any suitable wrench; but at the fourth corner, which is next to the cutter-bar, it is desirable to be able to turn the screw from the opposite side of the frame. For this purpose a bevel-gear b^4 engages the screw and meshes with a gear b^5 on a horizontal shaft b^6, which is carried in bearings on the frame and extends across the same, terminating in a squared end for engagement with the wrench. A third adjustable runner C at the top of the frame is adapted to engage with the wall. It is carried on bars c c, sliding in bearings on the frame, and adjusted by screws c' c'. The shanks of these screws are rotatably secured in lugs or keepers on the main frame, and the threaded ends engage the tapped ends of the bars c c.

At the head of the machine is a swinging cutter-bar D and the mechanism for swinging the same and driving the chain, which will be readily understood from the drawings, but is not included in this application. At the top of the chain-driving shaft d, which has its bearing in a circular-shaped extension of the main frame and which may be driven by any suitable motor, such as an electric motor E, carried in the frame A, is a disk e, with an adjustable crank-pin e', which drives a pitman e^2, which in turn operates a reciprocating rod e^3, carried in bearings on the frame. At the end of this rod is pivoted a rod e^4, which engages a pawl-arm e^5 on a shaft F, carrying a pawl e^6, which engages a ratchet-wheel f, which turns the shaft. The pawl may be thrown out of engagement with the ratchet-wheel when in operation by means of the device shown in detail in Figs. 9 and 10. The stem e^7 of the pawl is extended through the bearing in the arm and is provided at the end with a finger e^8, which rests against a cam formed by a sleeve e^9, carried on a shouldered pin e^{10}. This sleeve is held normally pressed toward the arm e^5 and is prevented from accidental turning by a projection e^{11}, which takes into recesses e^{12} in the

end of the cam-sleeve. At the outer end are four arms or pins e^{13}, by means of which the sleeve may be turned when desired. When the pawl is in engagement, the finger rests upon flattened places on the sleeve; but when it is to be thrown out the sleeve is turned and the finger pressed down, as shown in Fig. 10.

On the shaft F is feathered a worm f^2, bearing against a shoulder f^3 in the shaft. This worm engages with a worm-gear g on a vertical shaft g', which has suitable bearings in the frame A and carries the winding-drum G. A gear h, also rigidly secured to this shaft, meshes with an idler h', which meshes with a gear h^2 on the feeding-cylinder H. On this cylinder is cut a continuous right and left thread h^3, Fig. 6. A traveler I on the cylinder H is provided with an oscillating tongue i, which engages with the thread h^3. As shown in Figs. 7 and 8, this tongue is part of a plate i', which is carried in a chamber i^2 in the traveler and has a trunnion i^3 fitting in a bearing on a cover-plate i^4. The traveler also has a guide-arm i^5, which is forked at the end to engage a guide-rod i^6, secured in the frame. In this arm is an eye i^7, through which passes the cable J. Immediately behind the cable-feeding device is a pair of vertical guide-rollers $k\,k$, between which the cable plays. When the drum is being driven through the mechanism described, the cylinder H will be revolved by the train of gears and the traveler I will move up and down on the cylinder, the movement being so timed that the cable passing through the eye i^7 will be properly wound on the drum.

The cable may be fastened to any stationary object in order to draw the machine forward; but I prefer to pass it around a stationary sheave L and back to a suitable fastening, such as a hook d' on the cutter-chain bar D. By this arrangement an important and substantial advantage is obtained, as the machine will be fed forward more evenly and the strain on the bar-swinging mechanism is greatly reduced.

In Fig. 2, which shows the modified form of drum-actuating mechanism, m is a gear on the end of the armature-shaft e^{14}, which meshes with a gear m' on a stud on the frame A. This gear carries a disk e^{15}, with an adjustable crank-pin e^{16}, which drives a pitman e^{17}, pivoted directly to a similar pawl-arm e^{18}, as above described, and through the ratchet-wheel f^4 and shaft F' drives a worm f^5, which engages with an enlarged worm-gear g^3 on the drum-shaft. With either of the devices shown, when the cable is to be unwound the worm f^2 or f^5 is turned by the hands in the direction opposite to that in which it is driven, and as the worm-gear on the drum remains stationary the worm will be forced back on the shaft away from the shoulder and out of engagement with the said drum-gear. The drum is then free to revolve as the cable is pulled out. To prevent the mechanism from being forced away from the wall, which may occur when the cutting is especially difficult, I have provided an adjustable blade N, (shown in Figs. 1, 3, and 5,) which is pivoted at n to the runner B and extends to the end thereof. A screw n' is rotatably secured in a lug or flange at the end of this blade and passes through a threaded bearing b^7 on the end of the pin b^2. By means of this screw the end of the blade may be forced down into the floor, and thereby prevents the side movement of the machine. Figs. 11 and 12 show views of a star-wheel O, that may be carried on the end of the screw n' to take the place of the blade N.

I do not wish to limit myself to the exact construction or details shown; but

What I claim, and desire to secure by Letters Patent, is—

1. In a mining-machine, the combination of a frame, a motor mounted in said frame, a disk mounted on said frame, a train of gears from the shaft of said motor adapted to drive said disk, an adjustable crank-pin in said disk, a pitman connected to said pin, a swinging ratchet-arm adapted to be operated by said pitman, a shaft on which said arm is pivoted, a pawl on said arm, a ratchet-wheel on said shaft, means for manually throwing said pawl into and out of engagement with said ratchet-wheel, a worm feathered on said shaft, a shoulder on said shaft against which said worm bears, a cable-winding drum mounted on a shaft in said engaging worm.

2. In a mining-machine, the combination of a frame, horizontal bearings in the top of said frame, bars slidably secured in said bearings, screws for adjusting said bars and a runner secured to said bars, substantially as described.

3. In a mining-machine, the combination of a frame, runners for said frame, a blade pivoted to one of said runners, a nut secured to a bearing on said runner and a screw through said nut, engaging the free end of said blade.

SEWARD N. MIGHELL.

Witnesses:
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J. L. GOSS.