

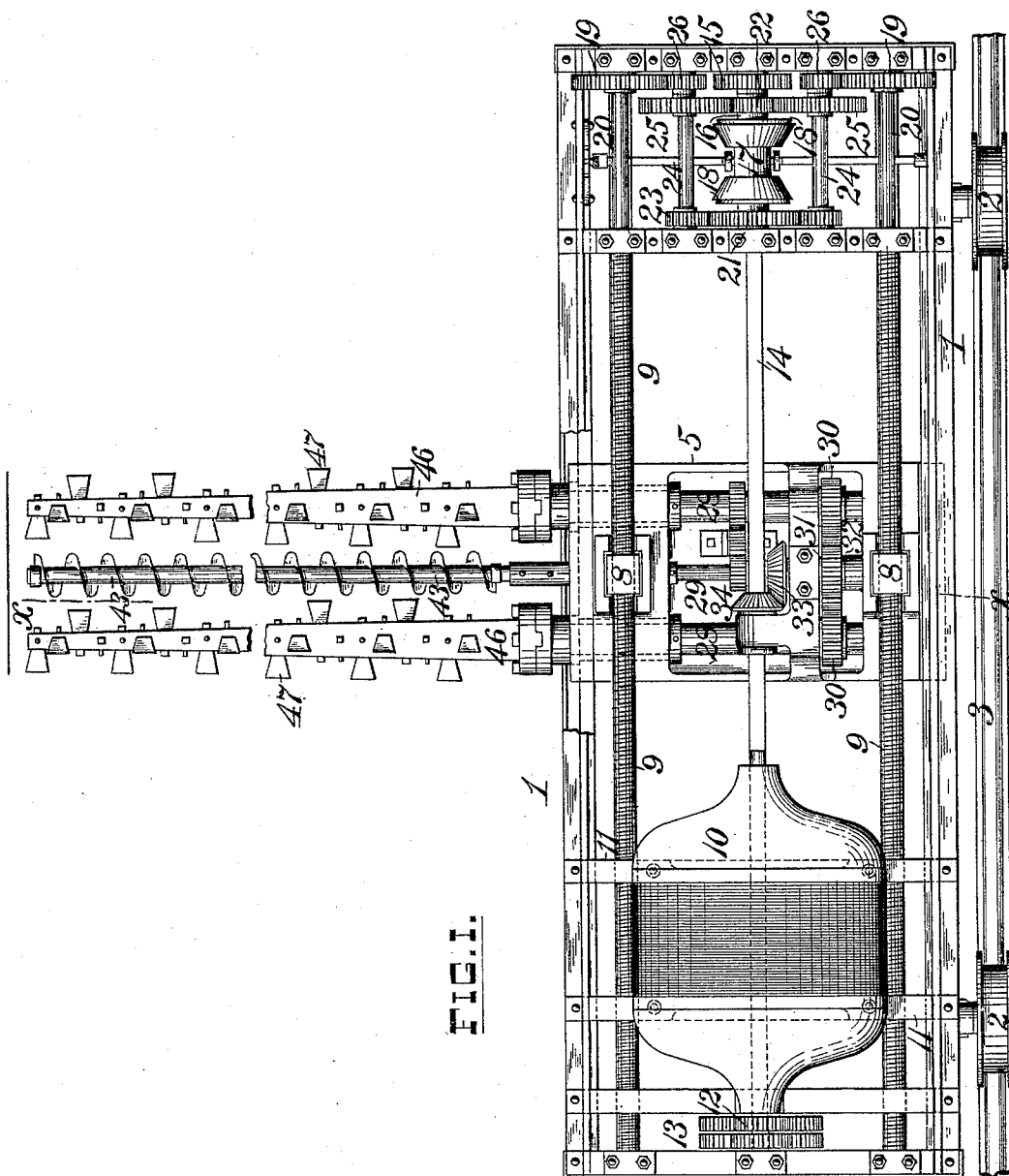
(No Model.)

3 Sheets—Sheet 1.

J. C. WERNER.
MINING MACHINE.

No. 465,150.

Patented Dec. 15, 1891.



WITNESSES:

C. A. Comp.
Darius B. Wolcott

INVENTOR,

John C. Werner,
by George H. Christie
Att'y.

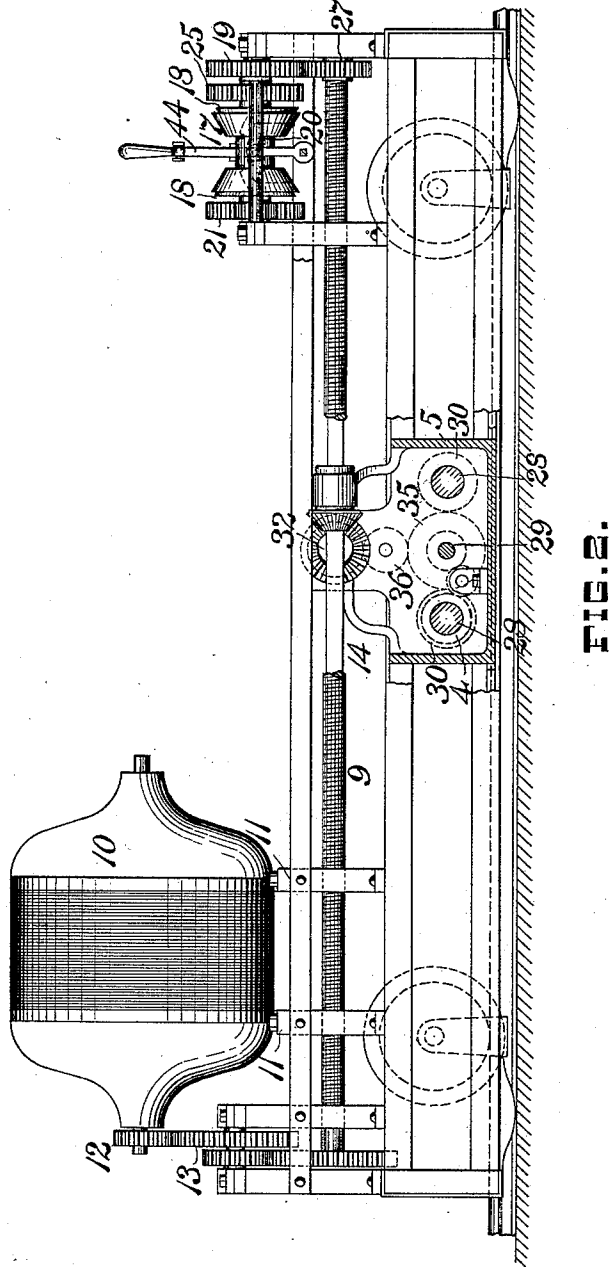
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3 Sheets—Sheet 2.

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Patented Dec. 15, 1891.



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(No Model.)

3 Sheets—Sheet 3.

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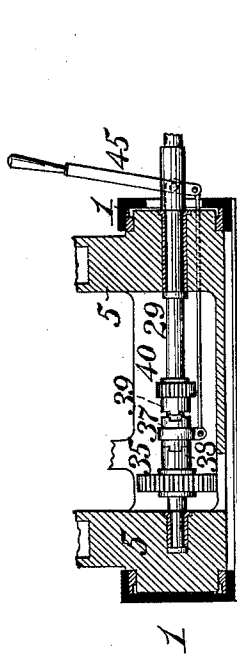


FIG. 4.

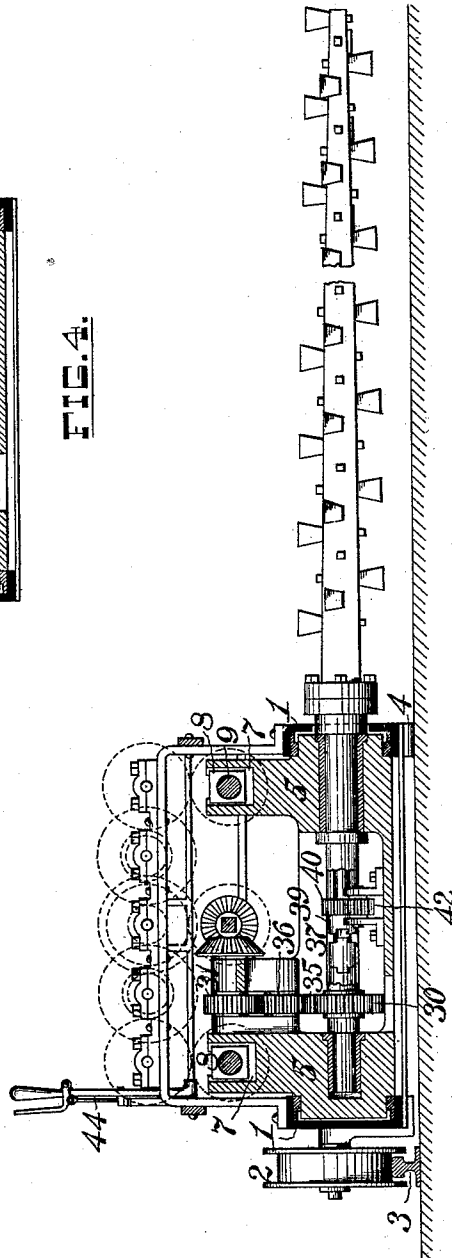


FIG. 3.

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UNITED STATES PATENT OFFICE.

JOHN C. WERNER, OF BALDWIN, ALLEGHENY COUNTY, ASSIGNOR OF TWO-THIRDS TO THOMAS B. MCKAIG AND JOHN M. PATTERSON, OF PITTSBURG, PENNSYLVANIA.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,150, dated December 15, 1891.

Application filed May 11, 1891. Serial No. 392,322. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. WERNER, a citizen of the United States, residing in Baldwin township, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Mining-Machines, of which improvement the following is a specification.

The invention described herein relates to certain improvements in mining-machines, and has for its object an arrangement of cutter-bars and clearing-worm as will permit of the movement of the cutter-bars in either direction and of the operation of the clearing-worm independent of the direction of movement of the cutter-bars.

In general terms the invention consists in the construction and combination, substantially as hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of my improved machine. Fig. 2 is a side elevation of the same, a portion being broken away to show the carriage. Fig. 3 is a sectional elevation, the plane of section being indicated by the line $x-x$, Fig. 1; and Fig. 4 is a sectional detail showing the operation of the clearing-worm clutch.

The frame 1 of the machine is provided on its rear side with wheels 2, adapted to run on the rail 3, while the front edge is supported by a bar or plate 4. The side bars of the frame are constructed to form ways or guides for the carriage 5, as shown in Figs. 2, 3, and 4, and said carriage is provided with sockets 7 for the reception of the nuts 8, through which pass the threaded feed-bars 9, having suitable bearings at the ends of the frame. While it is preferred to employ nuts detachably secured to the carriage, threaded holes may be formed through the carriage for the reception of the feed-bars 9. The motor 10, which may be electric or of any other suitable kind, is secured upon suitable cross-bars 11 of the frame, and on its armature-shaft is keyed a pinion 12, forming a portion of a train of gearing 13 by which power is transmitted to the shaft 14, mounted in suitable bearings longitudinally of the frame. On the opposite end of the power-shaft 14 is secured a gear-wheel intermeshing with the gear-wheel 15

on the counter-shaft 16, having the movable member 17 of a friction-clutch mechanism 30 mounted thereon, as to be free to move longitudinally while rotating therewith. The other members 18 of the clutch mechanism are secured on sleeves and loosely mounted on the counter-shaft 16 and having the pinions 21 and 22 secured on their outer ends. The pinion 21 is of larger diameter than the pinion 22 and intermeshes with small pinions 23 on shafts 24, while the smaller pinion 22 intermeshes with comparatively large pinions 25, also keyed to the shafts 24. This proportioning of the pinions permits of varying the speed of the shafts 24, which have pinions 26 keyed thereon, said pinions intermeshing with idlers 19 on shafts 20, which in turn engage gear-wheels 27 on the threaded bars 9. The varying speeds thus imparted to the bars 9 are by them transmitted to the carriage 5, in which the arbors 28 and 29 are mounted. On these arbors 28 are keyed the pinions 30, intermeshing with a pinion 35, loosely mounted on the intermediate arbor 29. This pinion 35 intermeshes with an idler 36 and it in turn with the pinion 31 on the counter-shaft 32. This counter-shaft has a beveled pinion 33 on its outer end engaging a corresponding pinion 34, provided with a hub mounted in suitable bearings in the carriage and having a squared opening therethrough for the passage of the squared shaft 14. This construction permits of the movement of the hub and pinion 34 along the shaft while rotating therewith. The pinion 35 has formed thereon one member 38 of a clutch mechanism, the movable member 37 thereof being so mounted on the arbor 29 as to rotate therewith while free to move longitudinally into and out of engagement with the member 38 or the member 39 of the clutch mechanism. The member 39 of the clutch mechanism is formed on the hub of the pinion 40, loosely mounted on the intermediate arbor 29, and is rotated through the medium of the idler 42 in a direction opposite to that of the pinion 35 by the pinion 41 on one of the arbors 28, in order that the clearing-worm 43, secured to the arbor 29, may always be rotated in the direction necessary to remove the dirt from the undercut. The movable members 17 and 37 of the clutch-

mechanisms are operated by the levers 44 and 45, respectively. On the arbors 28 are secured taper-bars 46, having secured therein a number of cutting-blades 47.

5 In operating, the machine is first arranged with its side at an angle to the coal-breast, so as to bring the blades at the outer ends of one of the bars 46 into operative position, and the motor is rotated in the direction necessary to move the carriage toward that end of the frame nearer to the coal-breast until the cutter-bar has cut in as far as possible. The machine is then shifted, so as to bring its sides parallel, or approximately so, with the coal-breast, and is moved in toward the latter as far as the cutter-bars will allow. The motor is then caused to rotate in either direction, thereby rotating the cutter-bar and clearing-worm and shifting the carriage longitudinally of the frame. As soon as the cut has been made to one side of the chamber, the motor is reversed, thereby shifting the carriage toward the opposite side of the chamber and bringing the blades of the other cutter-bar into operation. During the movement of the carriage in one direction the intermediate arbor 29 is driven by the pinion 35; but when the movement of the carriage is reversed the clutch 37 is shifted and the arbor

is rotated in the same direction as before by 30 the pinion 40 and idler 42 from one of the arbors 29. This construction and mode of operation permits of the employment of one clearing-worm, which is so located as to be operative to remove the dust when either one 35 of the cutter-bars is in operation.

I claim herein as my invention—

1. In a mining-machine, the combination of two rotary cutter-bars and an intermediate rotary clearing-worm, the cutter-bars operating independently of each other and of the worm, substantially as set forth.

2. In a mining-machine, the combination of a carriage, two rotary and reversible cutter-bars, and a clearing-worm rotated constantly 45 in the same direction, substantially as set forth.

3. In a mining machine, the combination of a movable carriage, two rotary and reversible cutter-bars, and an intermediate clearing-worm rotated constantly in the same direction, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN C. WERNER.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.