

N. D. LEVIN.  
COAL WORKING APPARATUS.  
APPLICATION FILED OCT. 1, 1906.

898,661.

Patented Sept. 15, 1908.

3 SHEETS—SHEET 1.

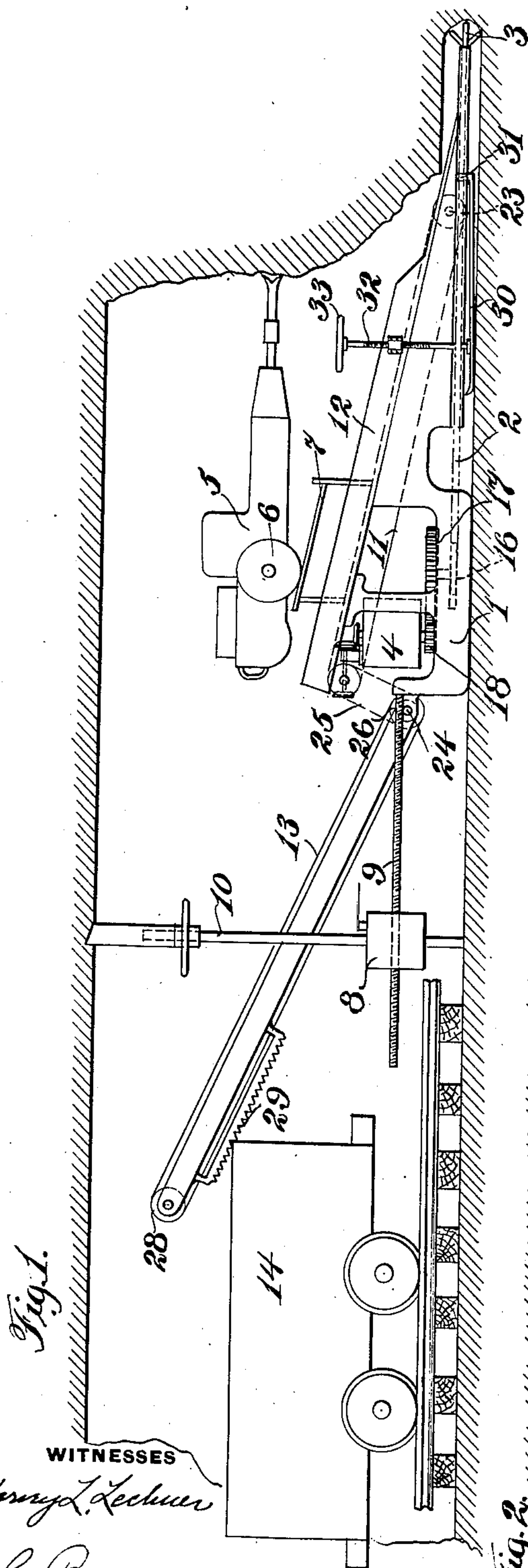


Fig. 1.

WITNESSES

Harry L. Lechner

J. C. Bradley

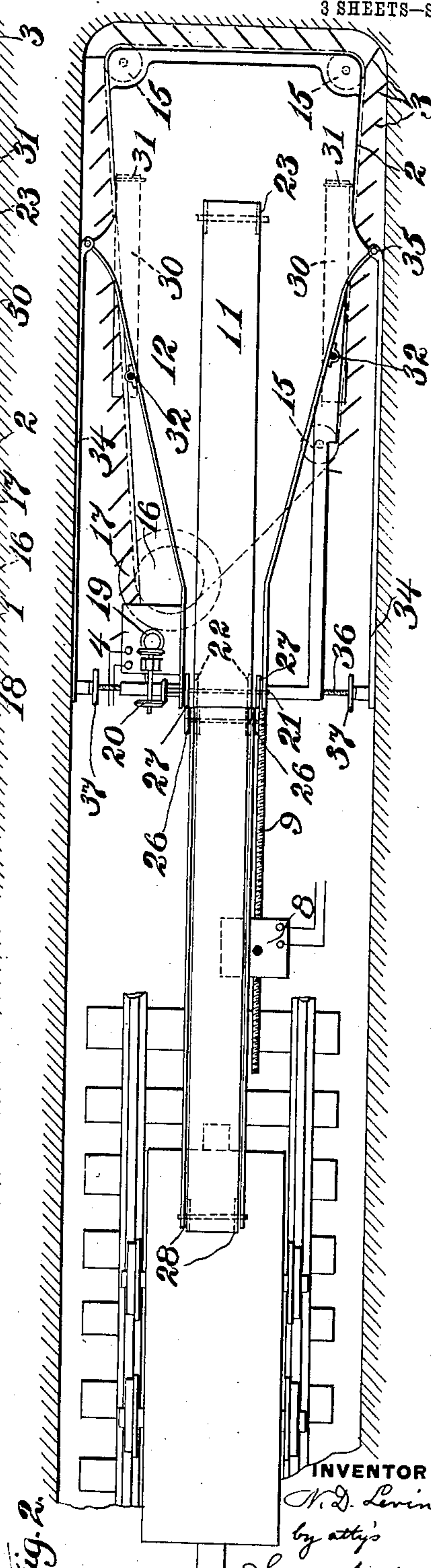


Fig. 2.

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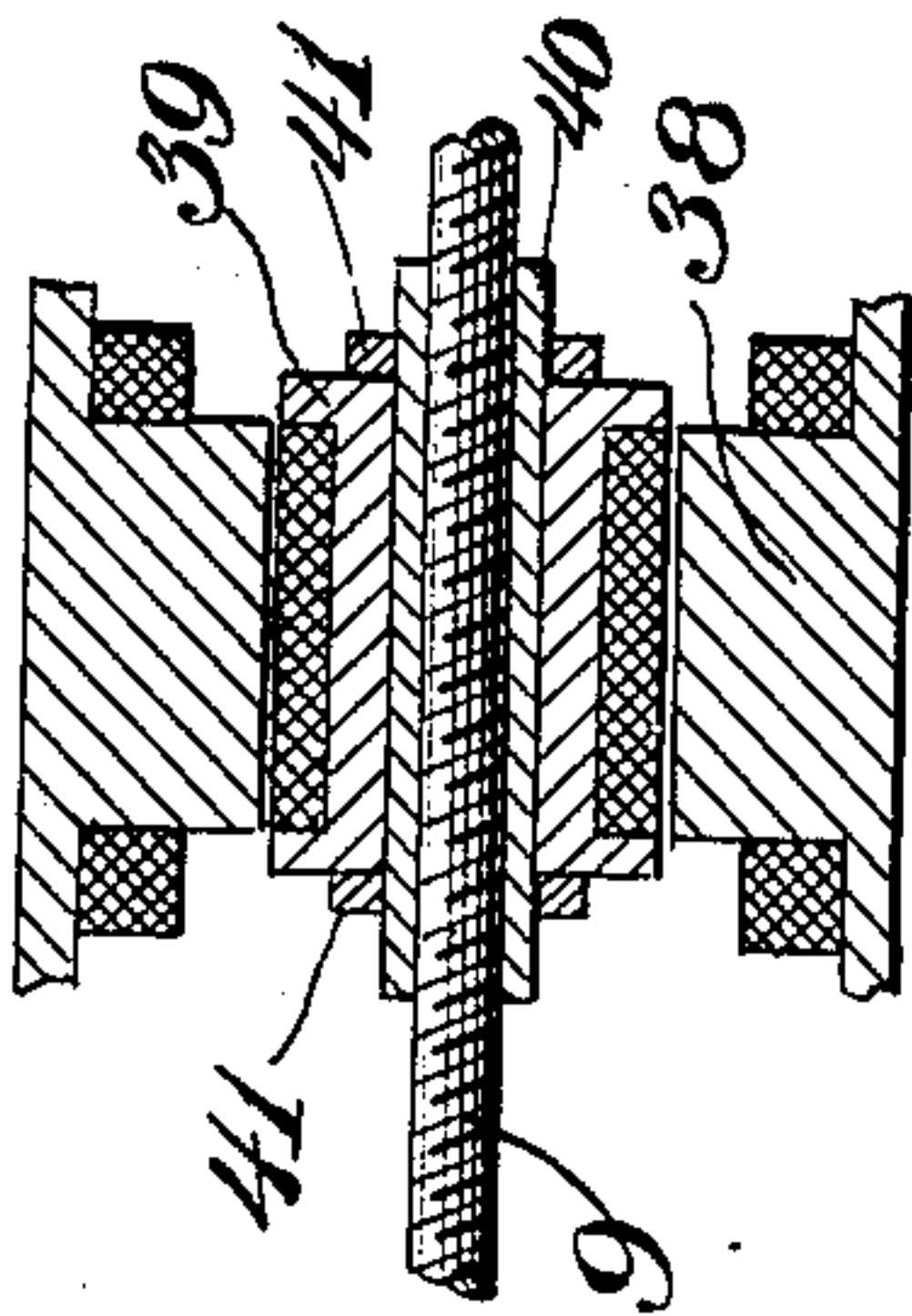
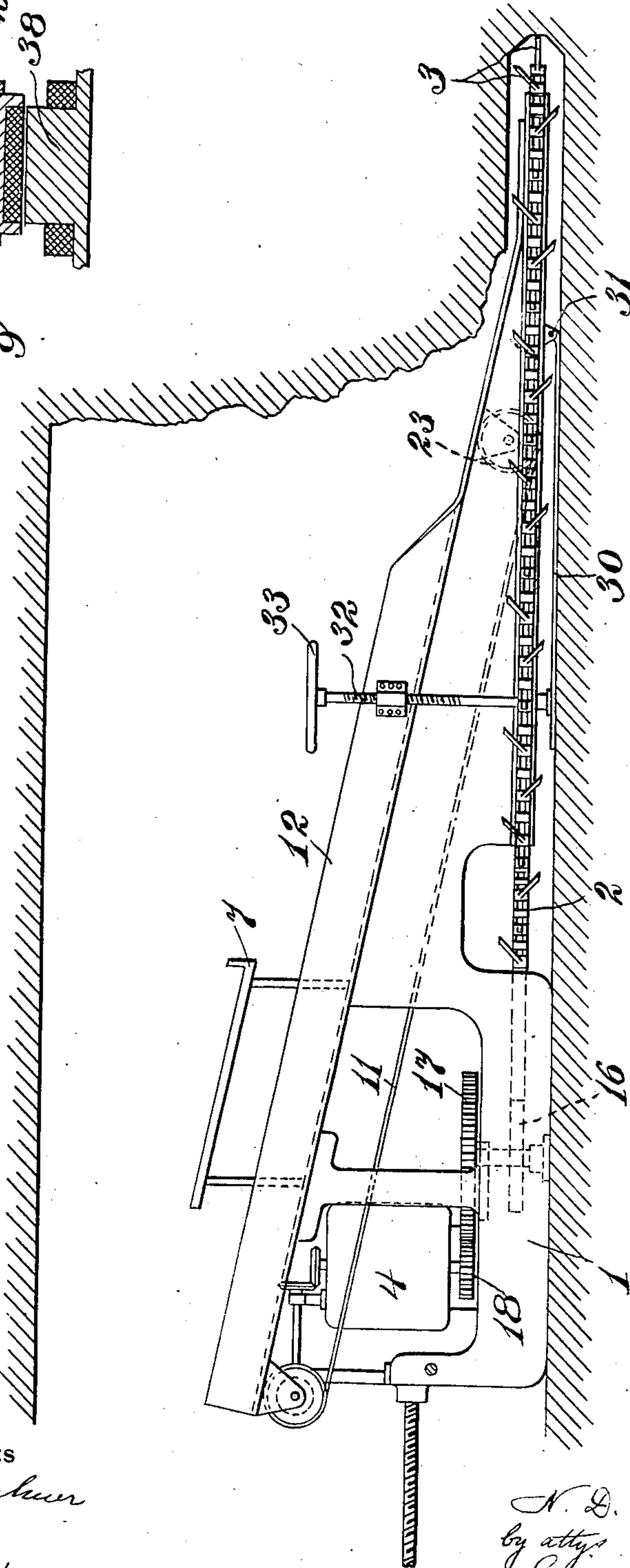


Fig. 5.

Fig. 3.



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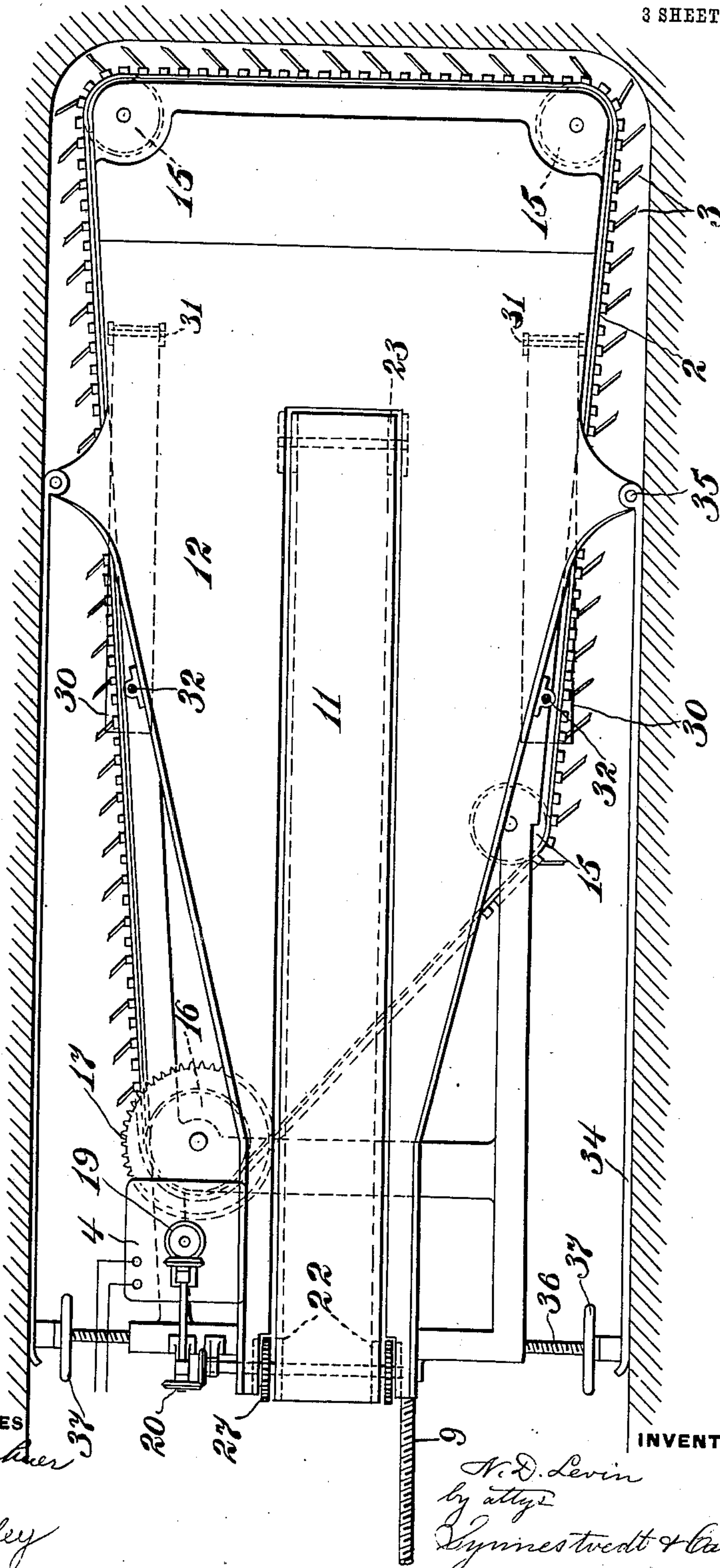
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3 SHEETS—SHEET 3.

Fig. 4



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# UNITED STATES PATENT OFFICE.

NILS DAVID LEVIN, OF CHICAGO, ILLINOIS.

## COAL-WORKING APPARATUS.

No. 898,661.

Specification of Letters Patent.

Patented Sept. 15, 1908.

Application filed October 1, 1906. Serial No. 336,952.

*To all whom it may concern:*

Be it known that I, NILS DAVID LEVIN, 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 Coal-Working Apparatus, of which the following is a specification.

My invention relates to an apparatus for cutting and removing coal and has for its objects; to provide a mechanism whereby the coal may be undercut and broken in sections without blasting; to provide a mechanism whereby the coal may be undercut and this undercut portion be broken up simultaneously and the product removed to the rear without the necessity of manual operation; to provide a mechanism whereby the coal may be cut and carried to the cars and loaded without manual labor and handling and wherein such removal takes place simultaneously with the cutting and does not interfere therewith; to provide a mechanism wherein the cutting and removing may be continued indefinitely in one direction without interruption; and to provide a mechanism which shall be simple and inexpensive in construction and which will materially reduce the cost of mining and removing the coal to the cars. These and other objects are accomplished by my improved construction one form of which is shown in the accompanying drawings wherein,

Figure 1 is a side elevation of the mechanism, and

Figure 2 is a plan view of such mechanism, the pick machine and the platform being removed.

Figure 3 is an enlarged side elevation of the mining machine,

Figure 4 is a plan view of the mining machine as shown in Figure 3, but with the pick supporting table removed, and

Figure 5 is a partial longitudinal section through the motor which feeds the machine forward.

Heretofore in the mining of coal it has been common to use an undercutting device comprising a flexible carrying means located in substantially a horizontal plane and provided with picks whereby a considerable area of coal was first undercut and then subsequently broken down by means of blasts on a line substantially parallel with the line of the undercutting. The coal was thus broken down in large masses and after the smoke and dust had disappeared, a gang of laborers

broke these masses of coal into small sections and removed them from the working chamber to the cars in the adjoining passage, after which a new undercut was made and the process continued as before. This method of operation has been objectionable in that the blasting is dangerous, considerable time must be lost while the smoke is being carried away and the dust settled, the breaking up of the large masses of coal and removing them from the working chambers by hand labor is expensive, and furthermore the undercutting mechanism has to be removed after each operation preliminary to the blasting and a further waste of time is necessitated. My mechanism is designed to overcome these objections and to work continuously, undercutting the coal, breaking it down and conveying it to the rear. The mechanism consists primarily of the horizontal undercutting mechanism which has been used heretofore, with a pick or punching machine mounted for universal movement upon the frame which carries the undercutting mechanism and a conveyer which operates intermediate the pick machine and the undercutting device and carries away the coal broken down by the pick machine and transfers it to the car which is placed to the rear of the machine. Since the coal is removed as it is broken down, it will be apparent that the mechanism can operate continuously and can be moved forwardly long distances until the body of coal is exhausted.

Referring now to the drawings, 1 is the frame of the machine which is mounted for movement along the floor of the mine and which may be, if desired, provided with wheels for securing easy movement, 2 is the flexible undercutting means provided with picks 3 operated from the motor 4, 5 is the pick machine which will ordinarily be fluid operated and which is mounted upon the wheels 6 for movement on a platform 7 of the frame 1 and which is thus in effect universally mounted, 8 is a motor cooperating with the screw 9 for feeding the frame back and forth, 10 is the anchoring means for securing the motor in place in the passage, 11 is a conveyer operated in the trough 12 above the undercutting mechanism which conveyer is driven from the motor 4, and 13 is a secondary conveyer extending from a position adjacent to the end of the conveyer 11 to position of discharge into the car 14. The motor mechanism for operating the screw 9



is shown in section in Figure 5, and as there shown 38 are the motor magnets secured to the frame, 39 is the armature and 40 is a feed screw socket secured to the armature and 5 held from longitudinal movement by means of the nuts 41.

Referring again to the undercutting mechanism it will be noted that the flexible carrying means 2 passes over three idler pulleys 10 15 and about the drive pulley 16 (Figure 1) which drive pulley 16 is keyed to the shaft carrying the spur gear 17, which is driven from the pinion 18 on the shaft of the motor 4, which is mounted upon the frame. The 15 shaft which carries the gear 18 also carries upon its upper end the gear 19, which gear 19 drives the train of gearing 20 from which the shaft 21, carrying the drive sprockets 22 for the conveyer 11, is driven. The lower 20 end of such conveyer passes around the idler sprocket 23. The conveyer 13 is driven from the shaft 24 by means of a chain connection 25 from the sprockets 26 on the shaft 24, to corresponding sprockets 25 27 on the shaft 21. The upper end of the conveyer frame 13 is provided with sprockets 28 which frame 13 is made with a notched holding means 29 for securely engaging the edge of the car 14. In order that the front 30 end of the frame 1 with its cutter may be adjusted vertically, a pair of shoes 30 are provided, which shoes are pivoted to the frame at 31 and are movable by means of the screws 32 passing through the frame, 35 which screws are provided with operating wheels 33. Provision is also made for the lateral adjustment of the machine which provision consists in the shoes 34 pivoted to

either side of the machine at the points 35 and adjustable toward and from the frame 40 by means of the screws 36, operable from the wheels 37. It will be seen that by means of these various shoes the frame may be guided in any desired direction either vertically or 45 laterally.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. In combination, a supporting frame, an 50 undercutting mechanism mounted thereon, a motor for operating such mechanism, and a pick machine mounted for universal movement upon the frame above the undercutting mechanism. 55

2. In combination, a supporting frame, an undercutting mechanism mounted thereon, a motor for operating such mechanism, a pick machine mounted upon the frame above 60 the undercutting mechanism, and means for adjusting the frame laterally.

3. In combination, a supporting frame, an undercutting mechanism mounted thereon, a motor for operating such mechanism, a pick machine mounted upon the frame above 65 the undercutting mechanism, and means for adjusting the front end of the frame vertically.

In testimony whereof, I have hereunto signed my name in the presence of the two 70 subscribed witnesses.

NILS DAVID LEVIN.

Witnesses:

PAUL CARPENTER,  
JAMES NICHOLAS LORENZ.