Oct. 8, 1946. C. E. BROWN 2,408,967

COAL MINING APPARATUS

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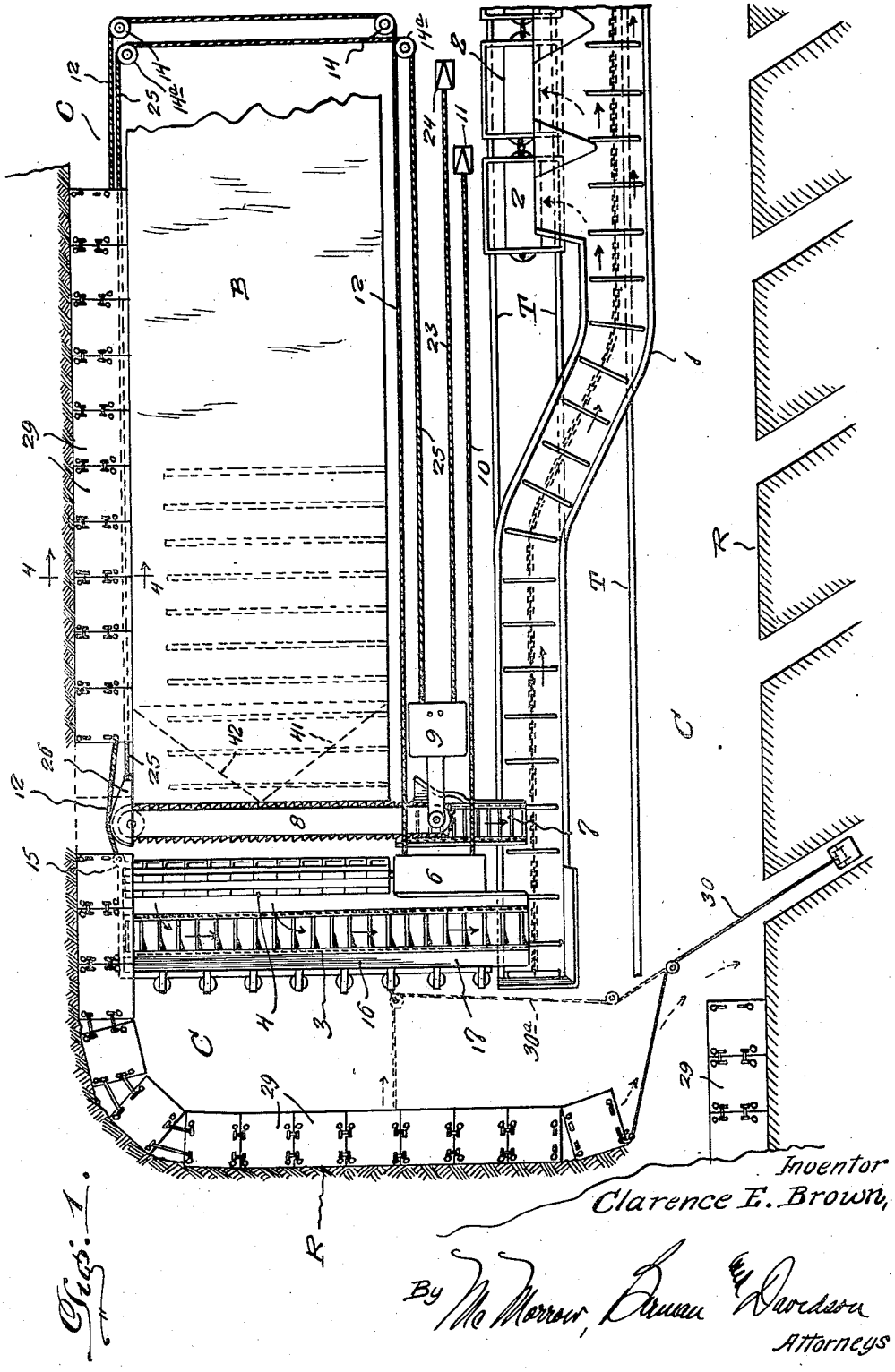


Fig. 1.

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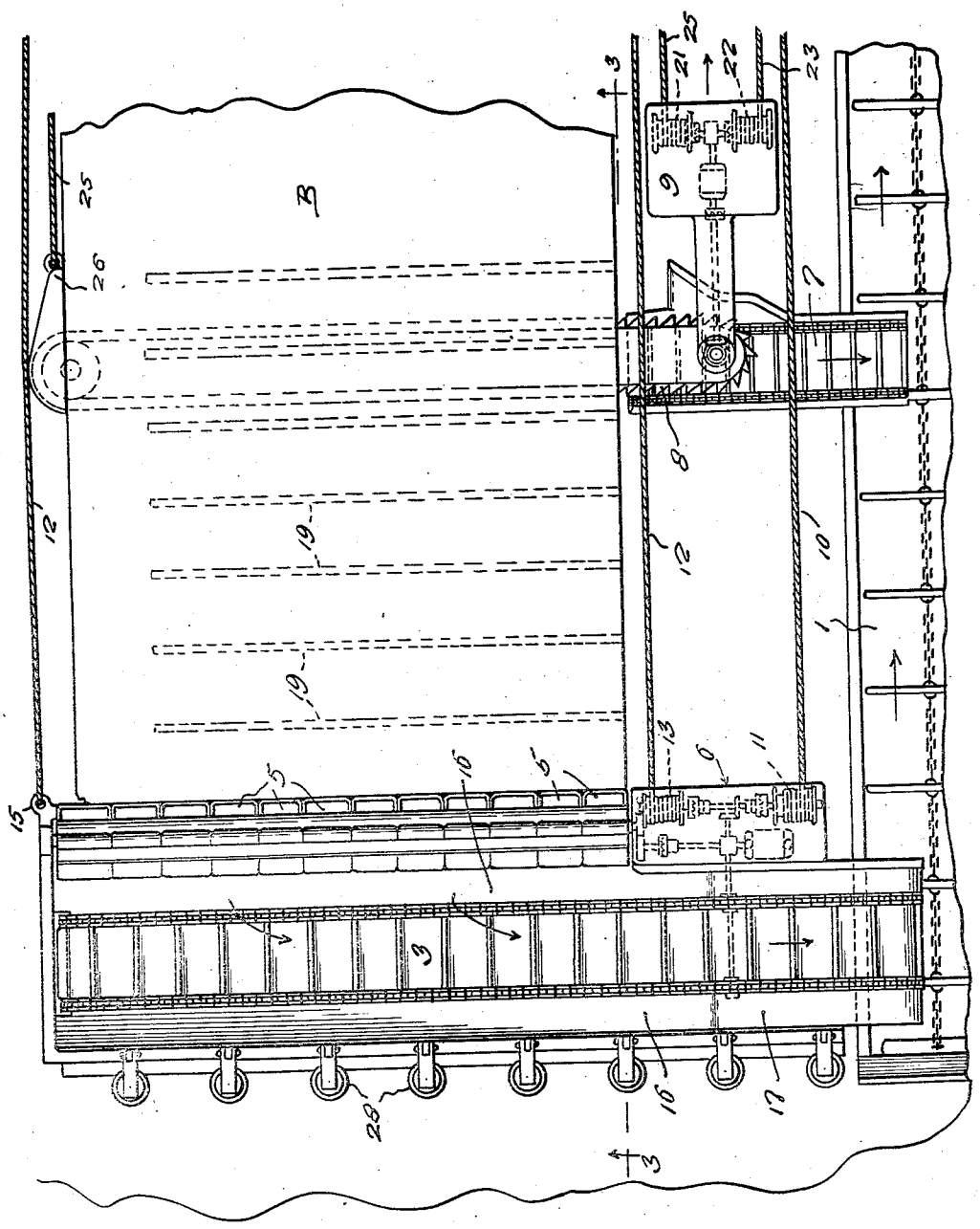


Fig. 2.

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COAL MINING APPARATUS

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Fig. 3.

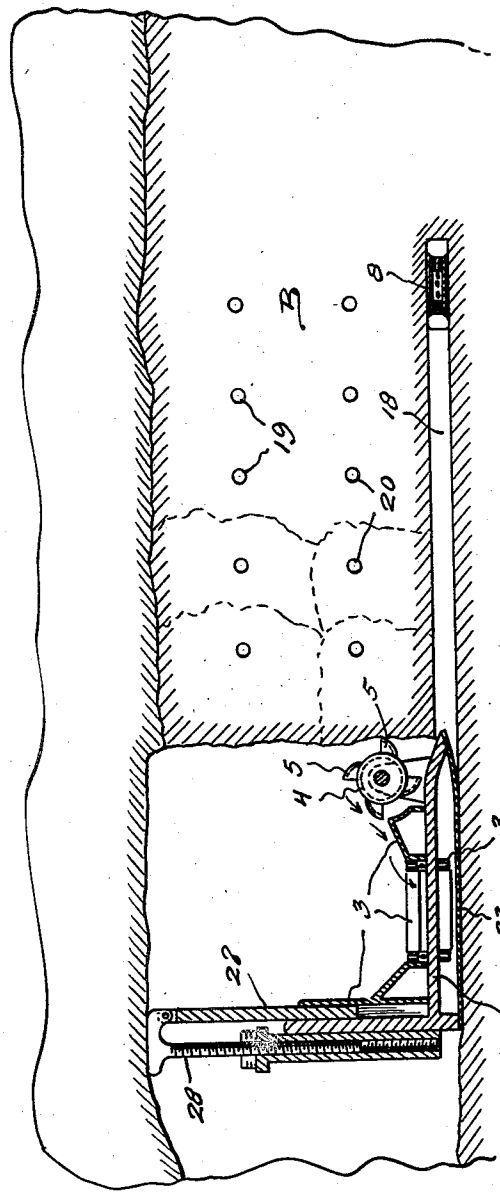


Fig. 7.

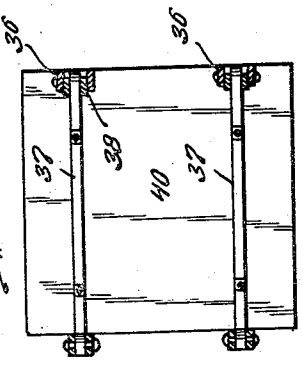
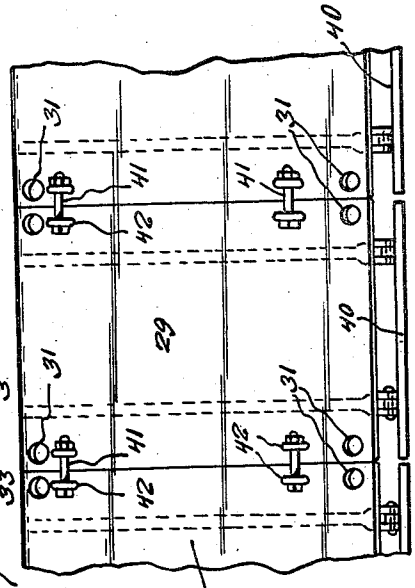


Fig. 6.



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Fig. 3.

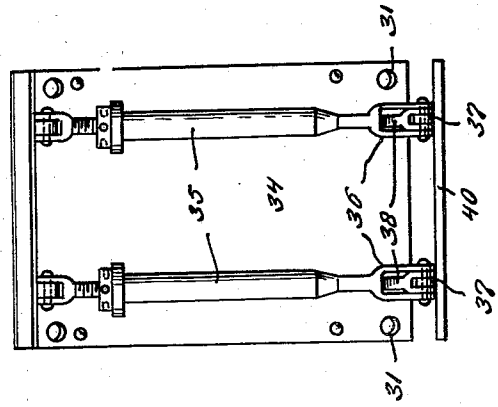
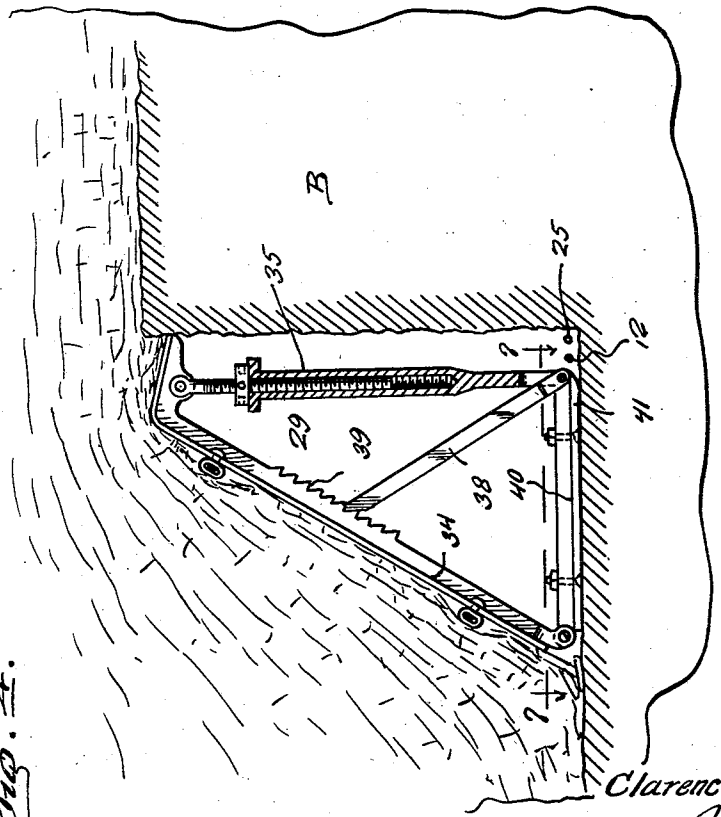


Fig. 4.



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UNITED STATES PATENT OFFICE

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COAL MINING APPARATUS

Clarence E. Brown, Clarksburg, W. Va.

Application September 21, 1945, Serial No. 617,706

4 Claims. (Cl. 262—30)

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The present invention relates to coal mining apparatus and is more particularly concerned with apparatus of the character mentioned which is adapted to remove the block of coal that is known as the "pillar."

In coal mining operations, it has been the practice heretofore to make three cuts through the coal block with the cutting machine. The cutting machine is usually operated through the exposed coal block in the center of the room, from one side to the other to make an open transverse cut. Then the cutting machine is operated laterally at right angles to the transverse cut, coming out at the inner end of the block, thus producing three communicating rectangular passages and three columns of coal at the end extending from floor to ceiling. The center column is then removed, usually by blasting and taken away by mine cars in the customary way. The two remaining columns or pillars of coal are then left to remain permanently in the room. They usually contain a large quantity of pay-coal and their retention involves a considerable monetary loss in coal mining operations, as practised.

The primary object of the invention is to provide apparatus which will obviate this method of mining coal and thereby save the incidental monetary loss above referred to, while at the same time insuring safety in the operations.

Another object of the invention is to provide coal mining apparatus of simpler and more compact construction than is disclosed in prior devices.

With the foregoing and other objects and advantages in view, the invention consists of the novel construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawings illustrating the invention:

Figure 1 is a diagrammatic plan view of the invention.

Figure 2 is a top plan view of the apparatus in operative position.

Figure 3 is a horizontal section on line 3—3 of Figure 2.

Figure 4 is a vertical transverse section on line 4—4 of Figure 1.

Figure 5 is a front elevation of the jack.

Figure 6 is a fragmentary rear elevation showing the jointure of several jacks.

Figure 7 is a horizontal section on line 7—7 of Figure 4.

Like reference letters and numerals in the description and drawings designate the same parts of construction.

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The room in which the operation is taking place is designated as R and the corridors as C. The coal block being taken out is designated B. In the lower corridor is the usual three rail track T on which the tipple 1 and mine cars 2 travel. The cars are loaded from one end of the moving tipple after receiving the coal at the other end from the longitudinally traveling, endless carrier 3 which is positioned lengthwise adjacent a rotary drum 4 bearing scoops 5. This drum rotates contra-clockwise and is revolved by a movable power unit 6. The endless carrier is adapted to travel towards the tipple, as indicated by arrows in Figure 1. Beneath the end of the cutter adjacent the tipple is a longitudinally moving, endless carrier 7 which is adapted to deposit some coal from an endless traveling cutting machine 8. This cutting machine derives power from a power unit 9 which also may be moved from place to place as the cutting operation progresses. The rotary drum 4, with scoops 5, is positioned longitudinally adjacent the cutting machine and between the same and coal carrier 3. After the block is undercut, as hereinafter described, and blasted, the scoops carry the coal over the drum and onto the carrier. Some of the coal will be carried onto the carrier by the blast alone, while other coal will be carried laterally and onto carrier 7, as before explained. Cable 10, which is anchored at 11, runs from power unit 6 where it passes around a powered drum 11 in said unit, and is adapted to be disengaged operatively by a clutch. A cable 12 is attached to another powered drum 13, in said power unit and thence passes around pulleys 14 at the outer end of the block to the extremity 15 to which it is removably attached.

The two units 3 and 4 are mounted on a movable base or platform 16 which, at the start of the block cutting operation, is positioned in close proximity to the wall of the inner end of the block and then advanced to close contact after each portion of the block is undercut and blasted down. This movement of base 16 is achieved by means of the cable 12. Power unit 6, which also operates carrier 3, is attached to base section 16. Section 17 is upwardly inclined to pass to the top of the tipple and there the carrier continuously discharges the contents received from revolving scoops 5.

Power unit 9 is adapted to rotate the cutting machine with its endless band of cutting teeth traveling in the direction indicated by arrows in Figure 2. This machine may be of a conventional type adapted to make a horizontal cut of only sufficient vertical dimension to facilitate

blasting of the overhanging ledge of coal as shown in Figure 3. When the undercut 18 is completed, two rows of holes, an upper one 19 and lower one 20, are drilled for the reception of the blasting charges which are to throw the overhanging portion of the coal block down. The upper row of holes is positioned near the top of the block while the lower row is a suitable distance above the cut 18.

Power unit 9 is provided with two cable drums 21 and 22 and supplementary clutches adapted to disengage each from a common shaft is driven by the motor of the power unit. A cable 23 runs from drum 22 to an anchor 24 and a cable 25, running on drum 21, passes around the block B on pulleys 14a to the opposite extremity of the cutting machine to which it is detachably connected, as at 26. When by means of said cables the cutting machine is advanced after each undercut operation, the unit itself is moved back by the cables and carrier section 7, which is attached to the under side of the outer end of the cutting machine also moves to the advance position. Power unit 9 is pivotally connected to the end of the cutter 8 to permit arcuate movement.

The sections of the base supporting units 3 and 4 are provided with a vertical, slidable wall 27 which is adjusted for height by means of a plurality of vertical jacks 28. Wall 27 serves as a back-stop for coal thrown forward by the blasting and such coal falls back and onto carrier 3.

Adjacent the walls of the corridors C and in desirable proximity to the operating units of this apparatus is a movable, sectional revetment made up of a plurality of jacks 29. These jacks are placed in a row along said wall from the entry end of corridor C to a point adjacent the inner end of tipple 1, where they are detached one by one and removed to any desirable location, such as the opposite longitudinal wall of room R. In the cross corridor at the inner end of the room they are arranged at a suitable distance from the wall of the hinged base 16 and 17. Removal or deployment of any jacks is achieved by means of powered cables 30 and 30a, the ends of which are hooked onto the tops or bottoms of the jacks at hook holes 31, as desired. Movable base 16 is mounted on transverse, integral shoes 33 adapted to slide on the floor of room R.

Jacks 29 consist of an upwardly inclined face plate 34 at the rear, the inclination of which can be adjusted by the vertical, hand-operated jacks 35. The lower ends are bifurcated as at 36 and there pivotally connected to horizontal bars 37 and to the lower ends of two pawls 38 which are adapted to engage at their upper ends with ratchets 39, vertically disposed on the inner face of plate 34. Horizontal bars 37 on jack base 40 are pivotally secured to the lower edge of the plate 34 and to the bifurcations 36. The bases 41 rest on the floor of room R. The upper edge of plate 34 is turned inwardly at an angle to fit under the ceiling of room R as shown in Figure 4. These jacks are pivotally connected

to the underside of said angular part of plate 34. They are adapted to be coupled in series by means of bolts 41 and eyes 42 with suitable play in the eyes to make a flexible joint between jacks.

In operation, the cutting machine 8 is first positioned to make an angular cut along dotted line 41, as shown in Figure 1, when the completed undercut extends from the side wall of the block B to about the center of the end wall. Then the cutting machine makes a similar undercut on the other side of the block, as indicated in dotted lines at 42, thus producing an angular undercut, leaving no "pillars," which are objectionable for the reasons first hereinbefore stated. After this cutting operation, the overhanging ledge of the block is blasted and the coal removed, as heretofore explained. The several units, including the cutting machine, are then advanced for the next cut and blast. This operation continues in successive stages until the entire block is cut away. This operation, as conducted, saves the coal which would otherwise remain unmined in the "pillars" and the coal in them represents a financial loss.

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

1. In combination, a rotatable, endless-band coal cutting machine adapted to produce convergent, angular, horizontal cuts through the corners of the inner end of a coal block; means for operating and moving said cutting machine to produce convergent, horizontal, angular cuts; powered rotatable scoops adapted to be positioned adjacent said cutting machine; an endless, rotatable coal carrier positioned longitudinally adjacent said scoops; a movable base adapted to support said carrier and scoops in common; powered means for advancing said base as the work progresses; powered means for advancing said cutting machine as the work progresses; a tipple adapted to receive the mined coal from said carrier; and a movable, sectional revetment adapted to barricade the walls of the mine room in the vicinity of the operations.

2. The construction set forth in claim 1, the base supporting said endless carrier being provided thereto with a vertically adjustable, vertical back-stop.

3. The construction set forth in claim 1, the said revetment comprising a plurality of adjustable, inclined jacks detachably coupled in series, manually operated, pivotal jacks adapted to regulate the inclination of the jacks, and ratchet and pawl means for locking said jacks in adjusted inclination.

4. A revetment jack consisting of an adjustable, upwardly inclined plate adapted to be coupled in series with similar plates; manually operated, pivotal, vertically-disposed jacks adapted to regulate the inclination or slant of said plate, and ratchet and pawl means adapted to lock said plates in adjusted inclination or slant.

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