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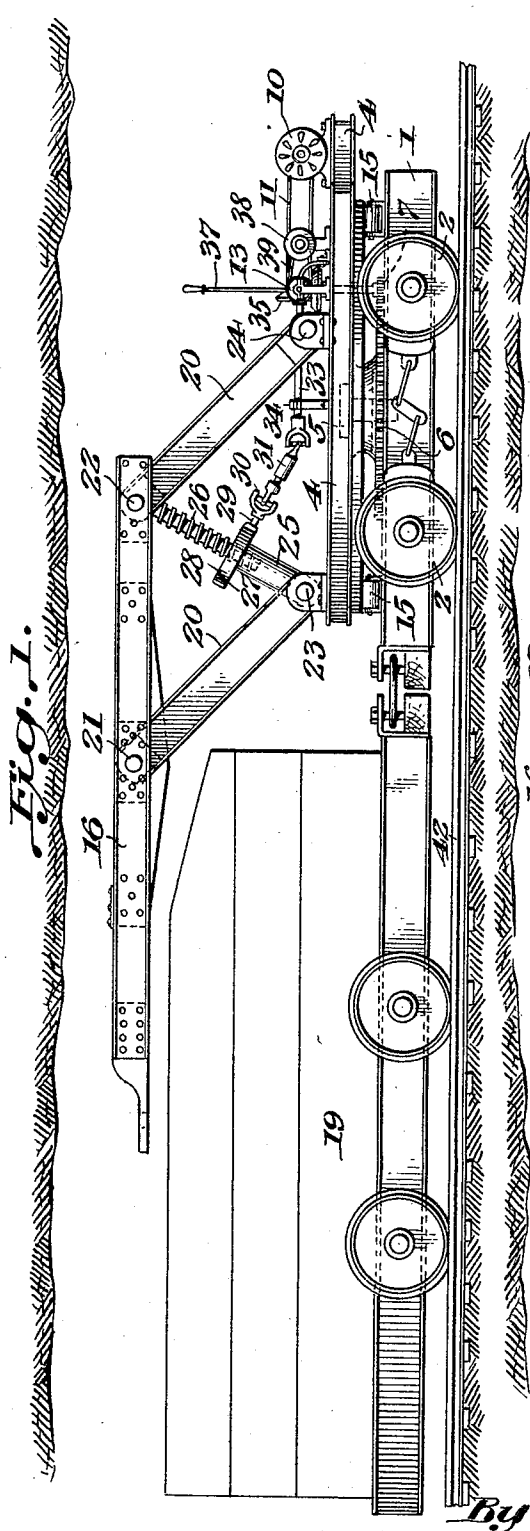
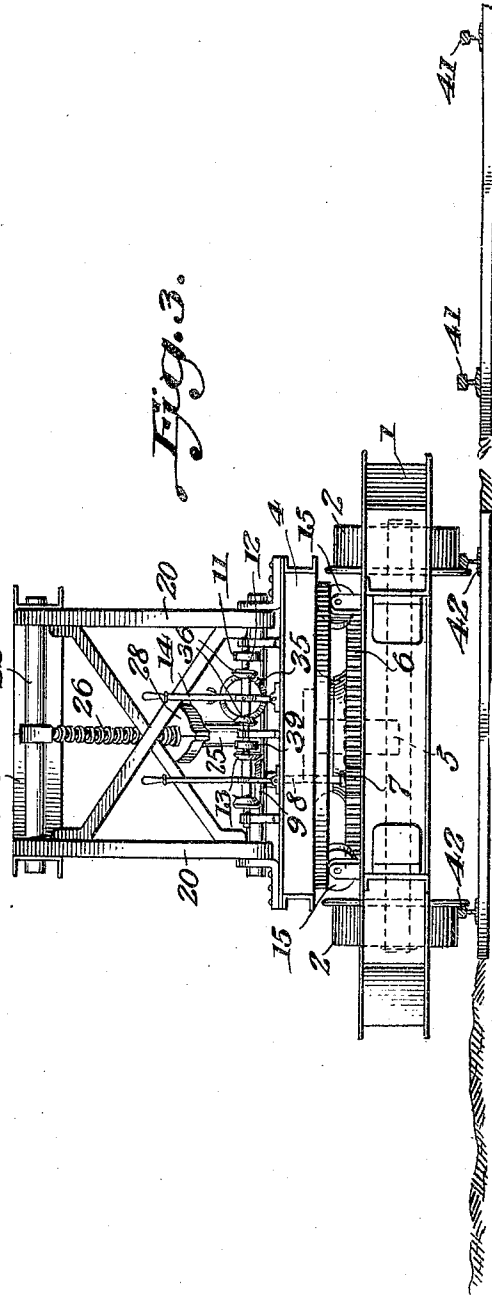
C. GOTTSCHALK ET AL

1,870,906

WHEELED MINE CRANE

Filed May 15, 1929

3 Sheets-Sheet 1



Inventor:
Charles Gottschalk
David T. Blakey
Frank C. Gore

Atty.

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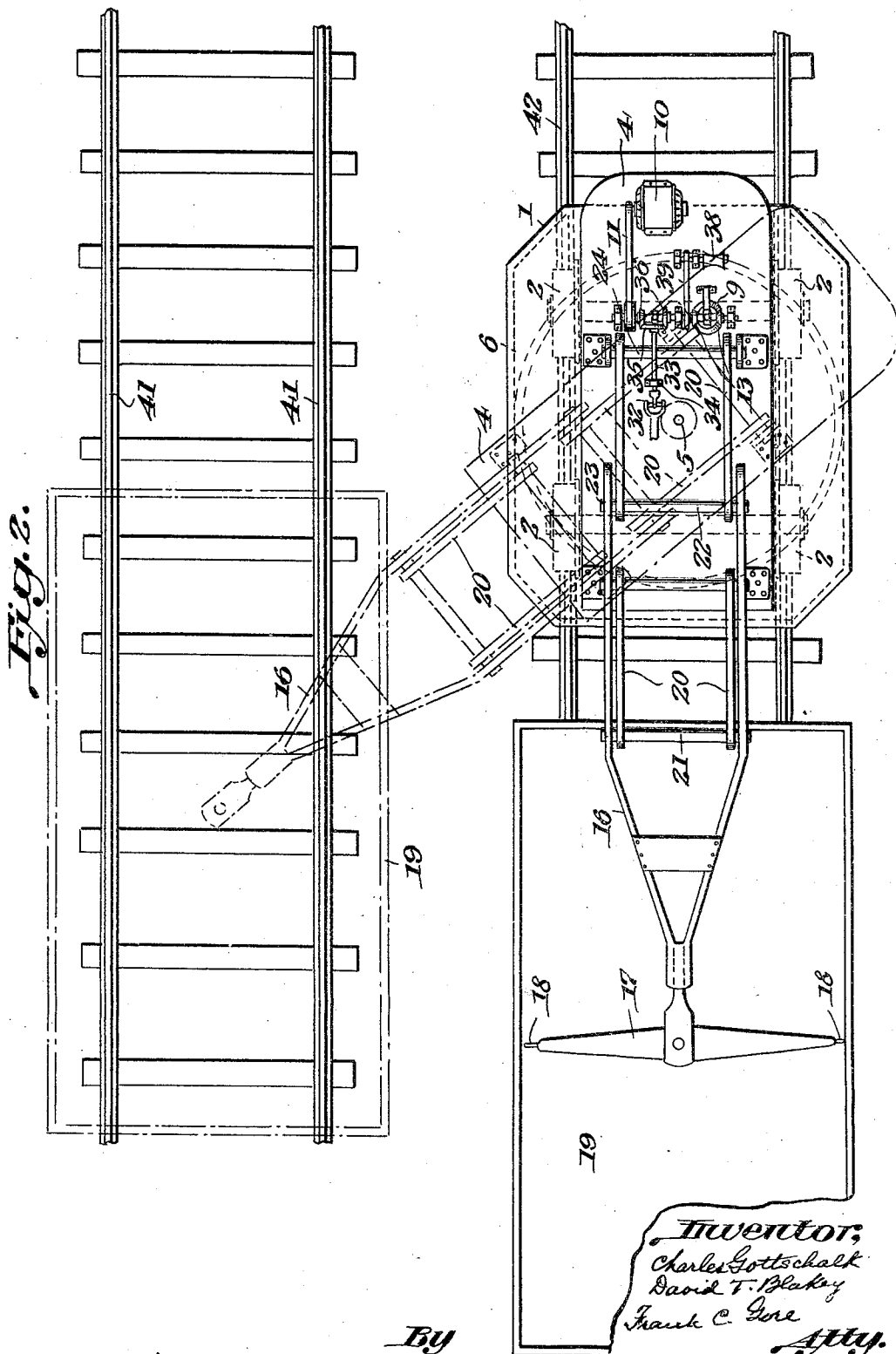
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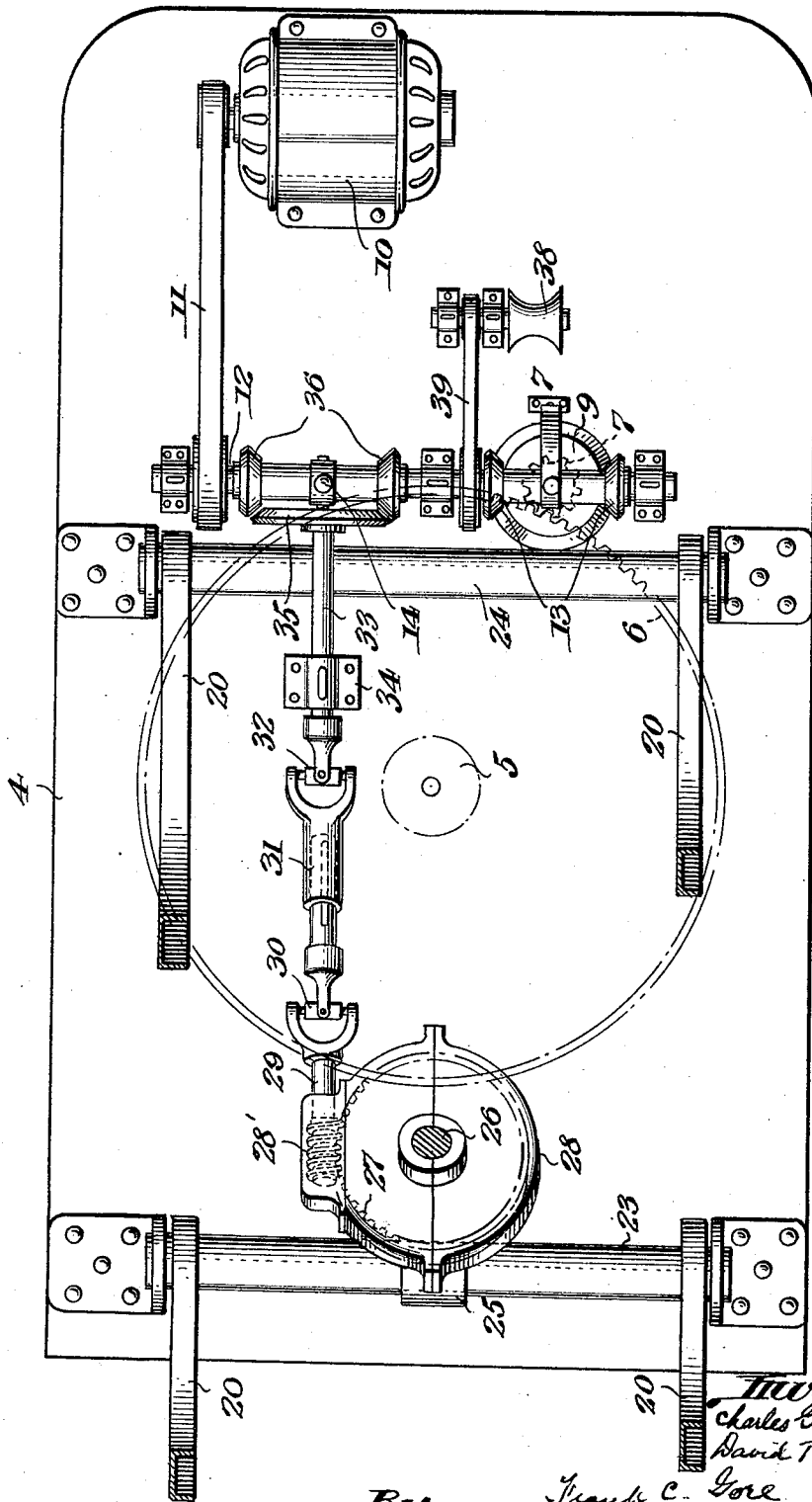


Fig. 4.

Inventor,
Charles Gottschalk
David T. Blakey

By

Frank C. Gore

Atty.

UNITED STATES PATENT OFFICE

CHARLES GOTTSCHALK AND DAVID T. BLAKEY, OF EVANSVILLE, INDIANA; SAID
BLAKEY ASSIGNOR TO SAID GOTTSCHALK

WHEELED MINE CRANE

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In coal mines where the coal is loaded into a mining car, the common practice is for a mine locomotive to pull the loaded cars out of the room and onto a switch, uncouple them, couple to an empty car and carry it back into the room to the loading machine. This operation consumes considerable time and results in added expense of operation.

The object of our invention is to provide an improved wheeled mine crane which will be adapted to pick up, and transfer to a parallel track in the room where mining is being carried on, an empty car and thus make it ready for loading, the mine locomotive dropping back one car length, and continuing this operation until a complete trip is made up.

We also propose to provide a wheeled mine crane or underground crane, adapted for general wrecking work in a mine, and for moving objects, and supporting timbers in the roof, when work of that character is required.

The invention contemplates the provision of a main truck having wheels to run on the track, a turn-table carried by the truck, improved means for turning the turn-table in one direction or the other, and novel crane arm and supporting levers therefor, as also novel means for raising and lowering the said arm; together with incidental improvements, the construction and operation of which will appear more fully hereinafter.

In the accompanying drawings:

Figure 1 is a side elevation showing the crane in position for transfer of a mine car;

Fig. 2 is a plan view thereof, dotted lines representing the position of the crane arm and turn-table when the mine car has been swung over to the parallel track;

Fig. 3 is an elevation taken at the right hand end of Fig. 1; and

Fig. 4 is a detail plan view of the crane, certain parts being broken away.

The truck 1 is provided with wheels 2 to run on the usual rails.

Surmounting the truck is a turn-table 4 which has a central pivotal mounting 5 and is provided with a gear 6 with which meshes a pinion carried by a vertical shaft 8 which has a frictional bevel gear 9.

An electric motor 10 carried by the turn-table 4, is connected by a belt 11 with a jack-shaft 12, said shaft having frictional bevel pinions 13, either of which may be engaged with the wheel 9 by operating the lever 14, thereby to enable the turn-table to be turned in one direction or the other.

Suitable rollers 15 carried by the truck 1, support the turn-table 4 to relieve its pivot 5 of strain.

The turn-table 4 carries our improved mine car elevating crane which comprises a double arm 16 to which a crossrod 17 may be connected and provided with chains 18 to support an ordinary mine car which is shown at 19.

The arm 16 is suitably trussed to afford the requisite strength and it is mounted for vertical movement in a plane parallel to that of the turn-table 4, by arms or links 20 which are arranged in pairs, and are connected to pivotal crossrods 21, 22 carried by the arms 16.

The arms 20 are connected to pivotal crossrods 23, 24 supported by suitable brackets attached to the turn-table 4.

A parallel-rule arrangement is thus provided, enabling the arm 16 to be raised or lowered in parallelism to the plane of the turn-table 4.

There is a tubular support 25 mounted on, or connected to, the turn-table 4 or to the front shaft or rod 23 and this is adapted to receive a screw 26 which co-operates with the arm 16.

A worm wheel or gear 27, contained within a case 28, has a screw-threaded bore engaged with the threads of the elevating and lowering screw 26 so that when the worm wheel 27 is turned in one direction, the screw 26 will be raised and when said gear 27 is turned in the opposite direction, said screw 26 will be lowered, thereby raising or lowering the arm 16. The gear 27 is carried by the tubular member 25.

A worm pinion 28' which is contained within the case 28 and meshes with the gear 27, is driven from the shaft 12, when desired.

The pinion 28' is carried by a shaft 29 which has a universal joint connection with a two-section telescopic splined shaft

31, which in turn, has a universal joint connection 32 to a shaft 33.

The shaft 33 is mounted in suitable bearings 34 carried by the turn-table 4 and it is provided with a friction bevel gear 35. The gear 35 may be driven from shaft 12 by the friction pinions 36 carried by shaft 12 and subject to the control of lever 37. When one of said pinions is engaged with the gear 35, the screw 26 is elevated and when the other of said pinions is engaged with said gear 35, the screw 26 is lowered.

A drum winch 38 may be suitably mounted on the turn-table 4 and driven by belt 39 from shaft 12. This enables a cable to be wound on the drum 38 for wrecking, or other purpose, as may be necessary.

The arms 20 are preferably provided with cross braces to afford added strength, and it will be understood that the arm 16 may be trussed or braced in any desired manner.

Instead of using a single track, we propose to provide an additional or parallel track 41 which may serve as the loading track. The hauling track is shown at 42.

An empty car, shown at 19, may be picked up by our crane, and the crane will swing laterally by revolving the turn-table, to enable the empty mining car 16 to be placed on the rails of the parallel track 41 for loading purposes. This operation can be continued by the shifting of the crane on the rails 42, one car length at a time, by the mine locomotive.

Our mine crane may be used in any work within the mine, such as moving objects, wrecking work, or, the support of mine timbers in the roof when work of that character is required.

What we claim is:

1. In a wheeled mine crane, the combination with a truck, of a crane arm, pairs of supporting arms pivotally connected to said crane arm and to the truck, and, means for raising and lowering the crane arm comprising a screw co-operatively related to the crane arm, an anchored wheel having a screw-threaded bore engaged with said screw, whereby turning of the wheel causes movement of the screw through the wheel, and means for rotating said wheel.

2. In a wheeled mine crane, the combination with a truck, of a crane arm, pairs of supporting arms pivotally connected to said crane arm and to the truck, and means for raising and lowering the crane arm comprising a screw co-operatively related to the crane arm, an anchored worm wheel having a screw-threaded bore engaged with the screw whereby turning of the wheel causes movement of the screw through the wheel, a worm pinion for driving said worm wheel, and means for controlling the direction of revolution of the worm pinion.

3. In a wheeled mine crane, the combina-

tion with a truck, of power driven means carried by the truck, a jack-shaft driven by said power means, a crane arm mounted on said truck for raising and lowering, an elevating and lowering screw for the crane arm, an anchored gear having a screw-threaded bore engaged with said screw, a gear and pinion and an operating shaft connecting the jack-shaft to the aforesaid anchored gear, whereby the anchored gear aforesaid may be turned so that the crane arm may be operated from the jack-shaft, and means for controlling the direction of revolution of the operating shaft whereby the crane arm may be raised or lowered.

4. In a wheeled mine crane, the combination with a truck, of a crane arm, parallel rocker arms mounting said crane arm on the truck adapting said arm to remain in substantially horizontal position at all times, an elevating screw movable with the crane arm, gear and pinion means for raising or lowering said screw and which are carried by said screw, power means on the truck, and a telescopic shaft provided with universal joints, said shaft being adapted for driving the aforesaid gear and pinion means from the power means aforesaid.

In testimony whereof we affix our signatures.

CHARLES GOTTSCHALK.
DAVID T. BLAKEY.