

No. 765,833.

PATENTED JULY 26, 1904.

W. E. HAMILTON.
LOCOMOTIVE CAR PULLER.
APPLICATION FILED DEC. 18, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

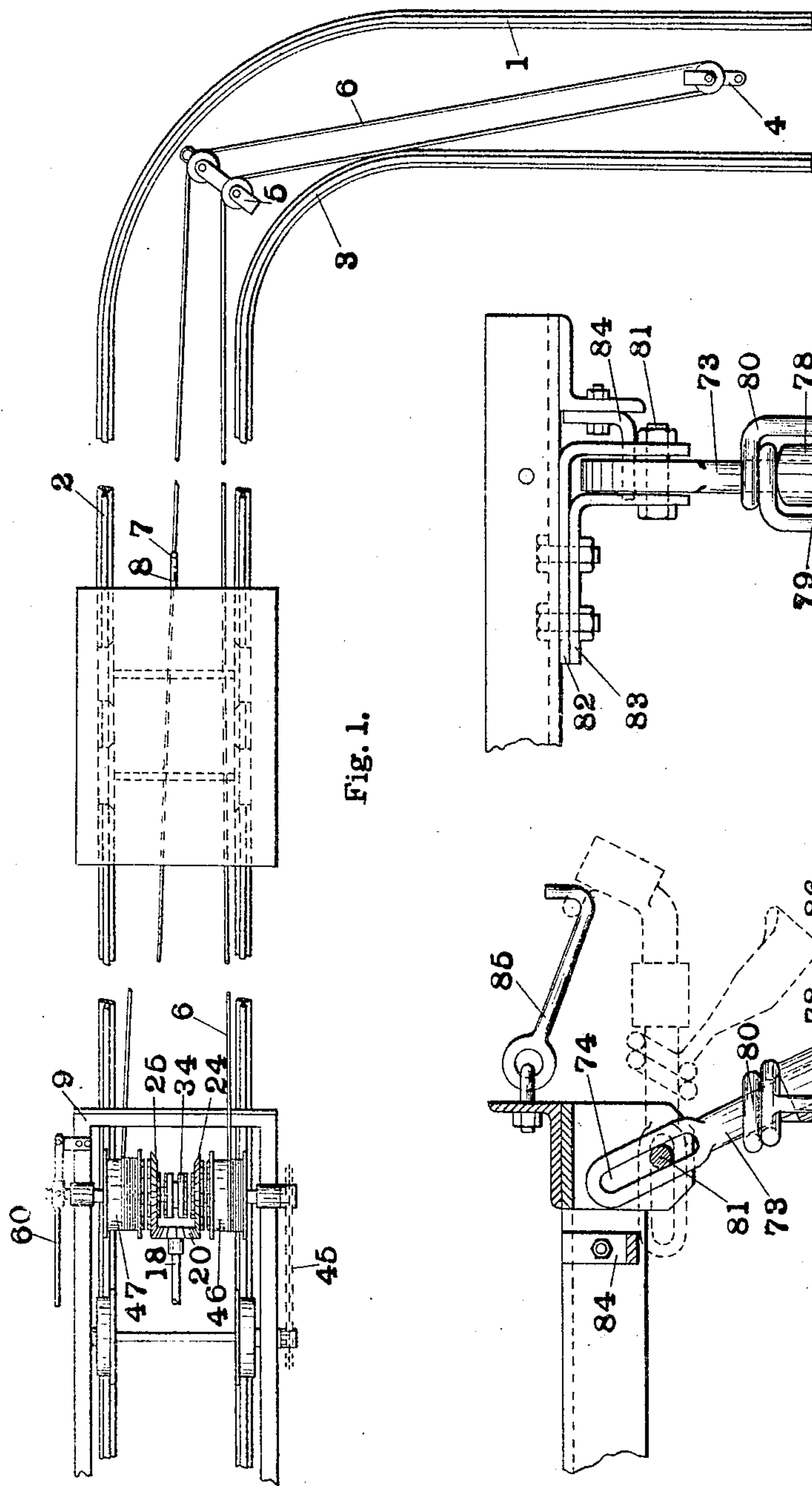


Fig. 1.

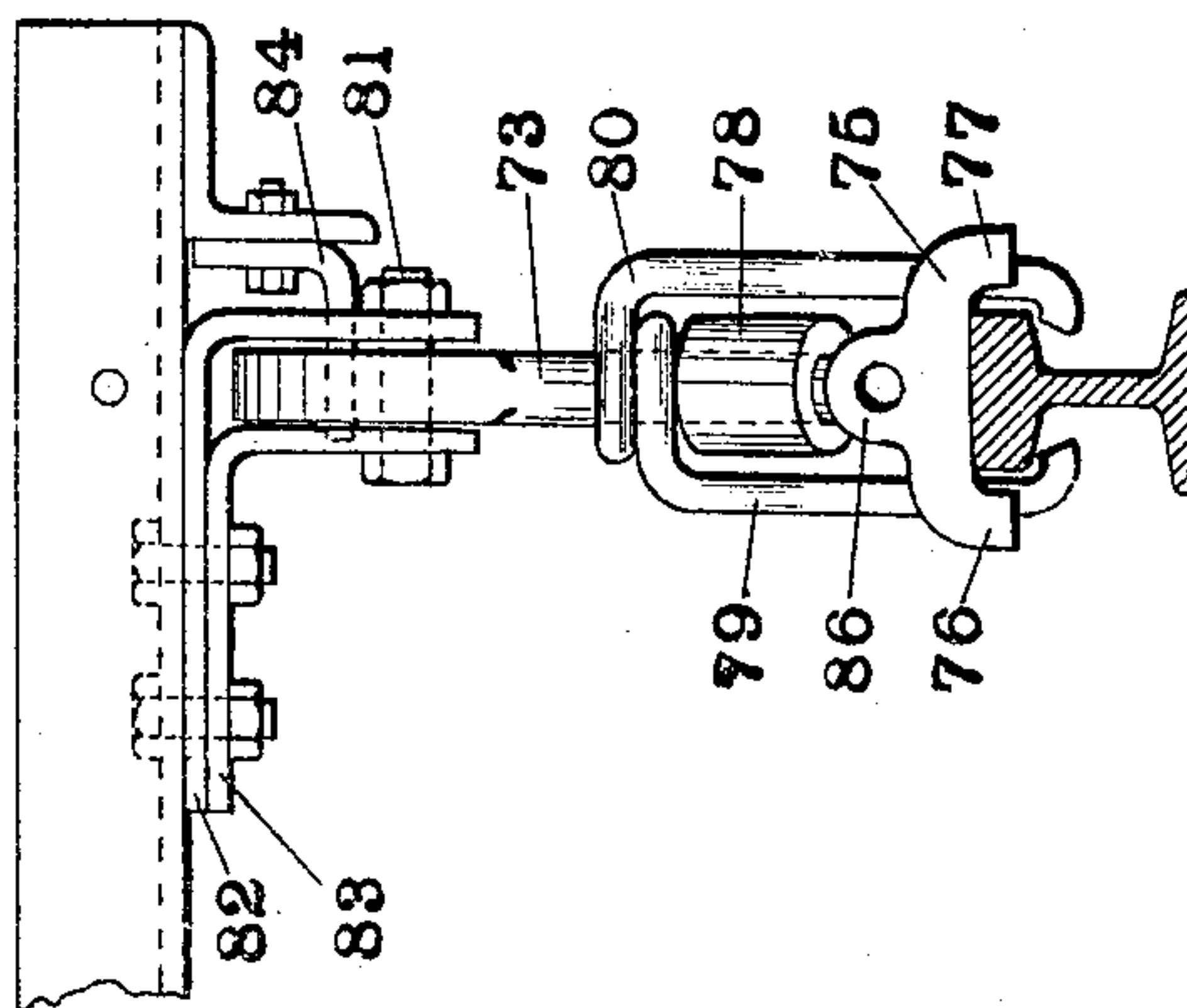


Fig. 6.

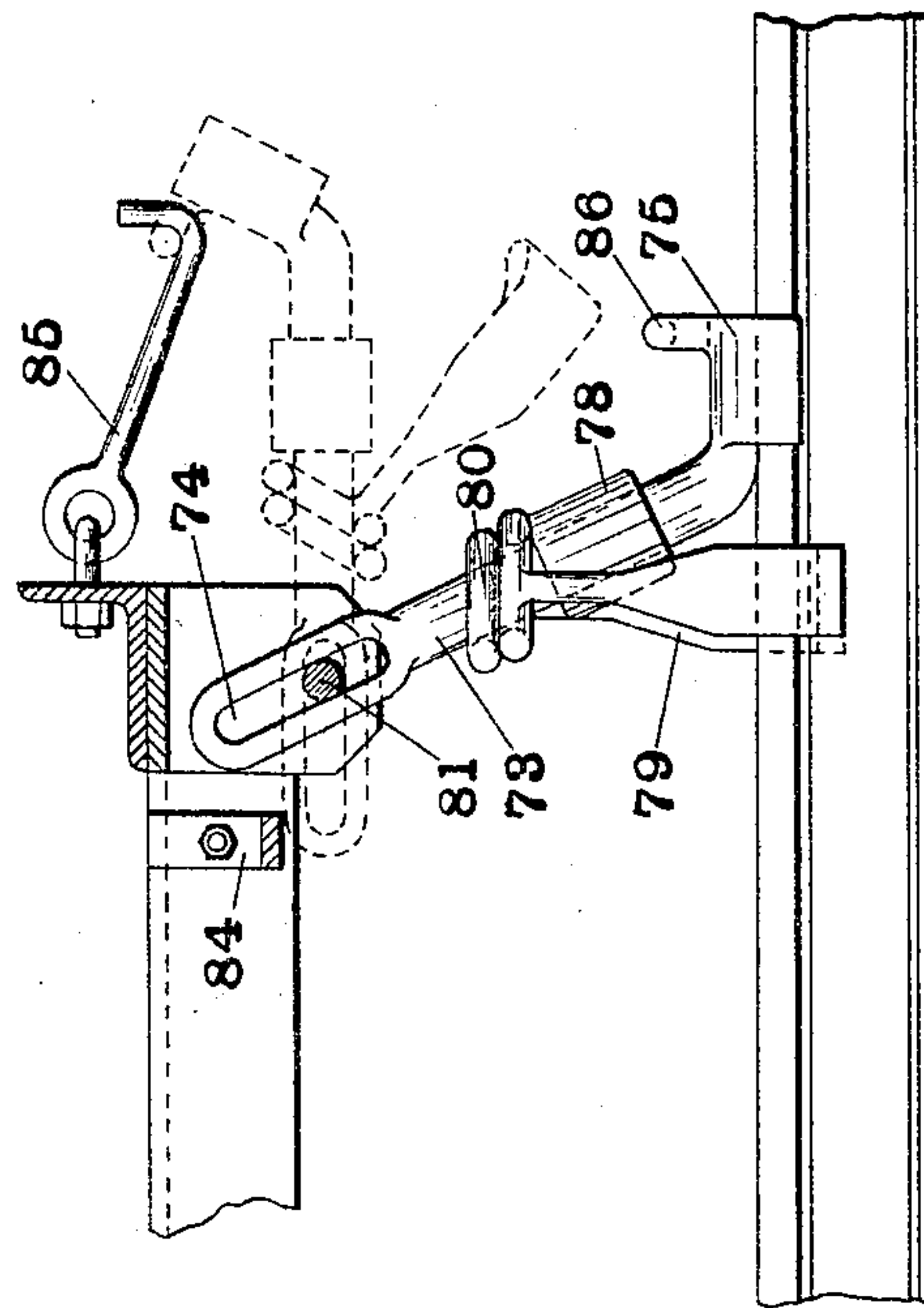


Fig. 5.

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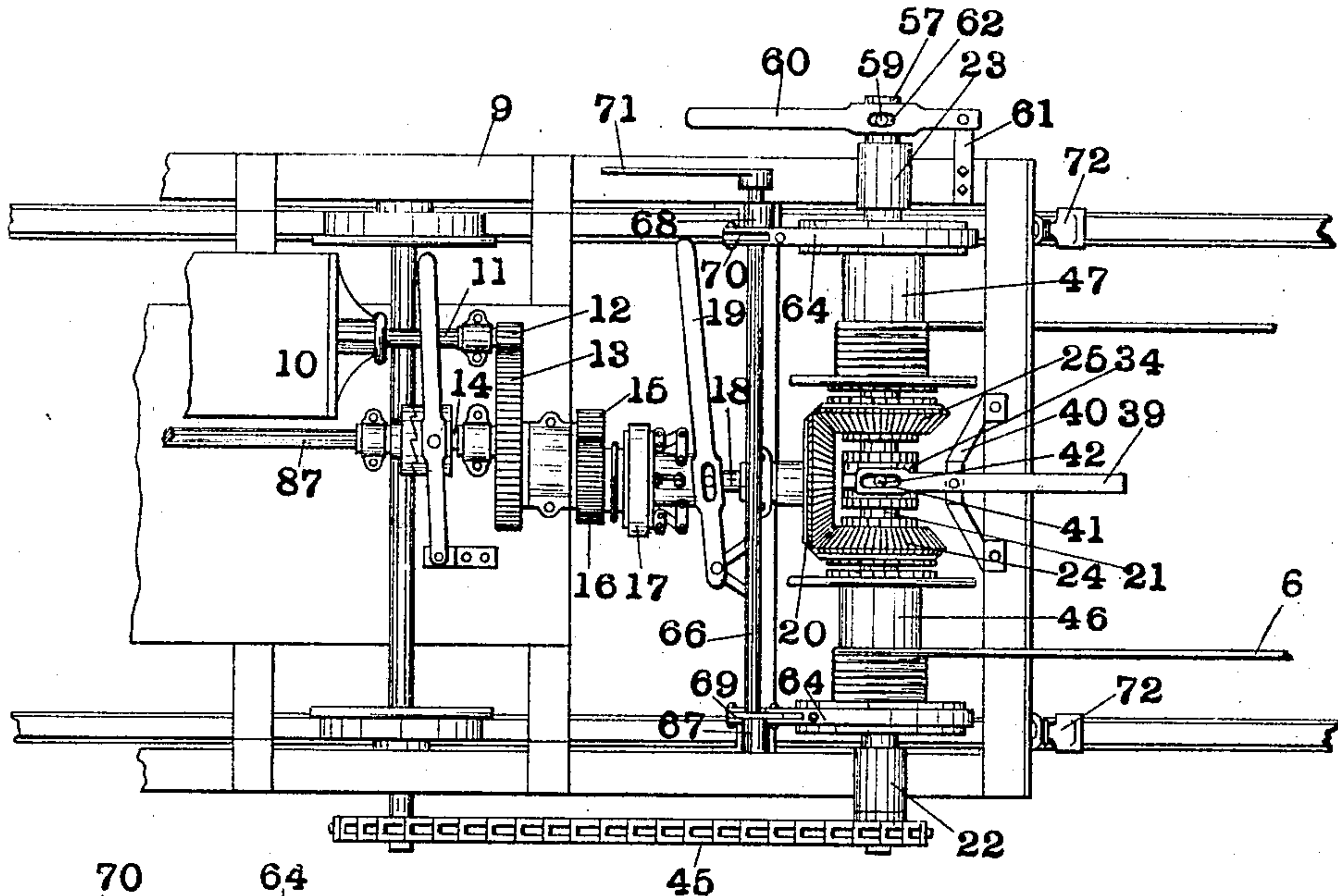


Fig. 2.

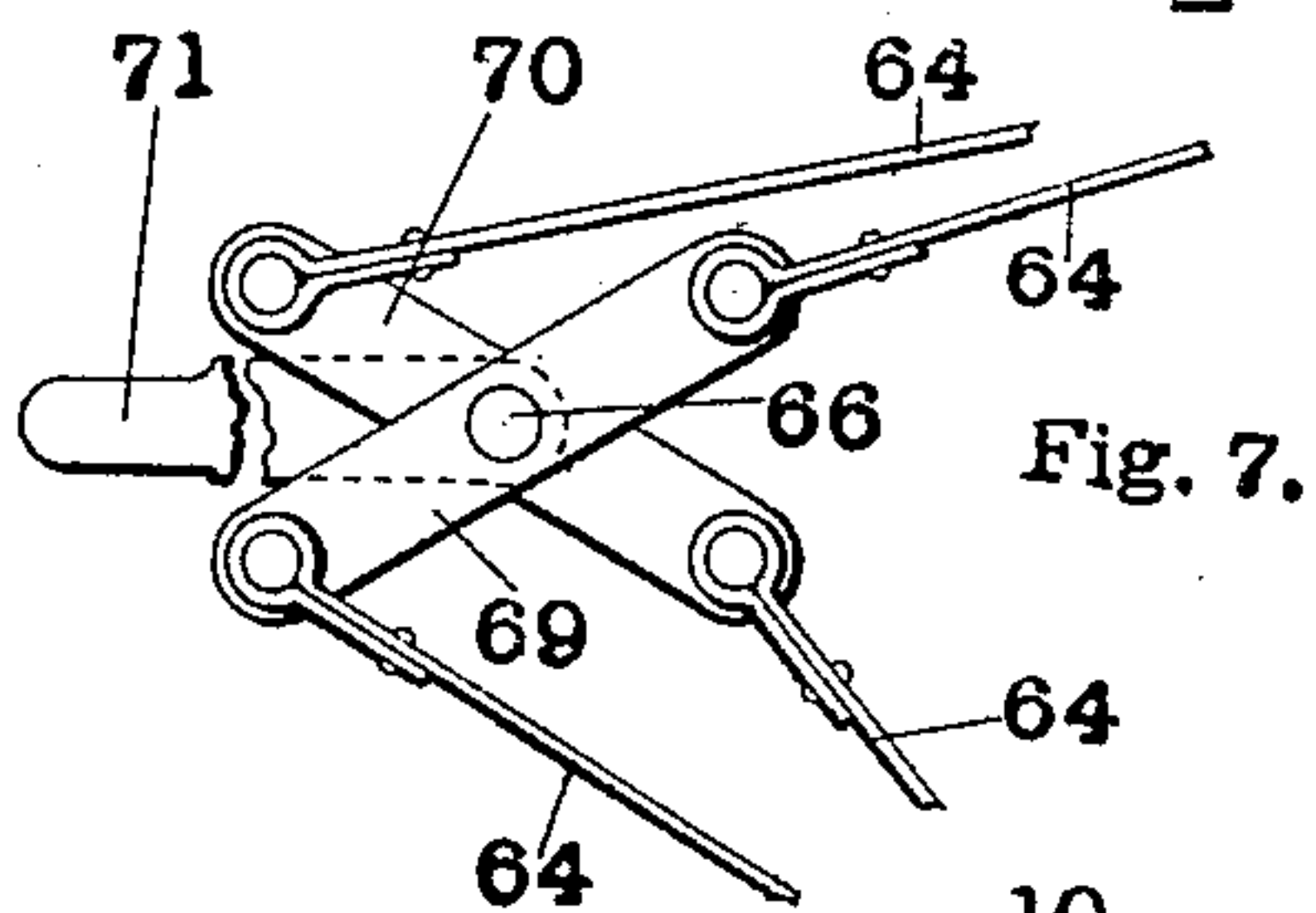


Fig. 7.

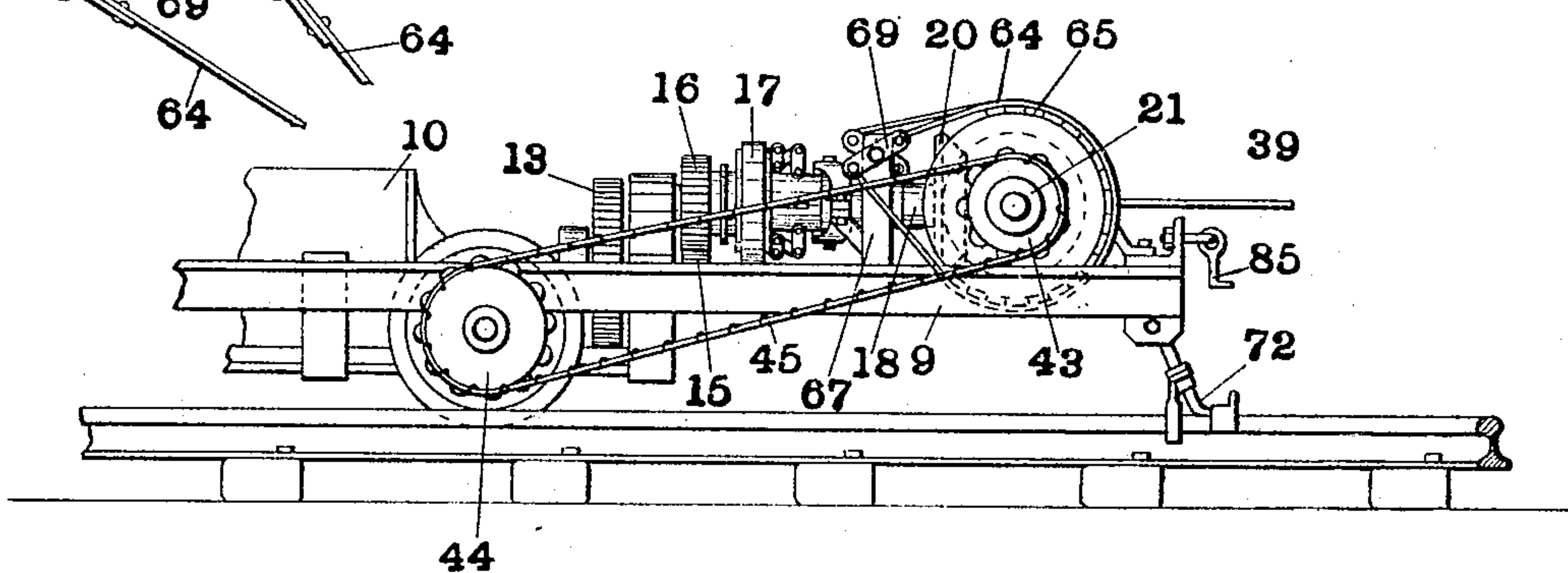


Fig. 3.

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3 SHEETS—SHEET 3.

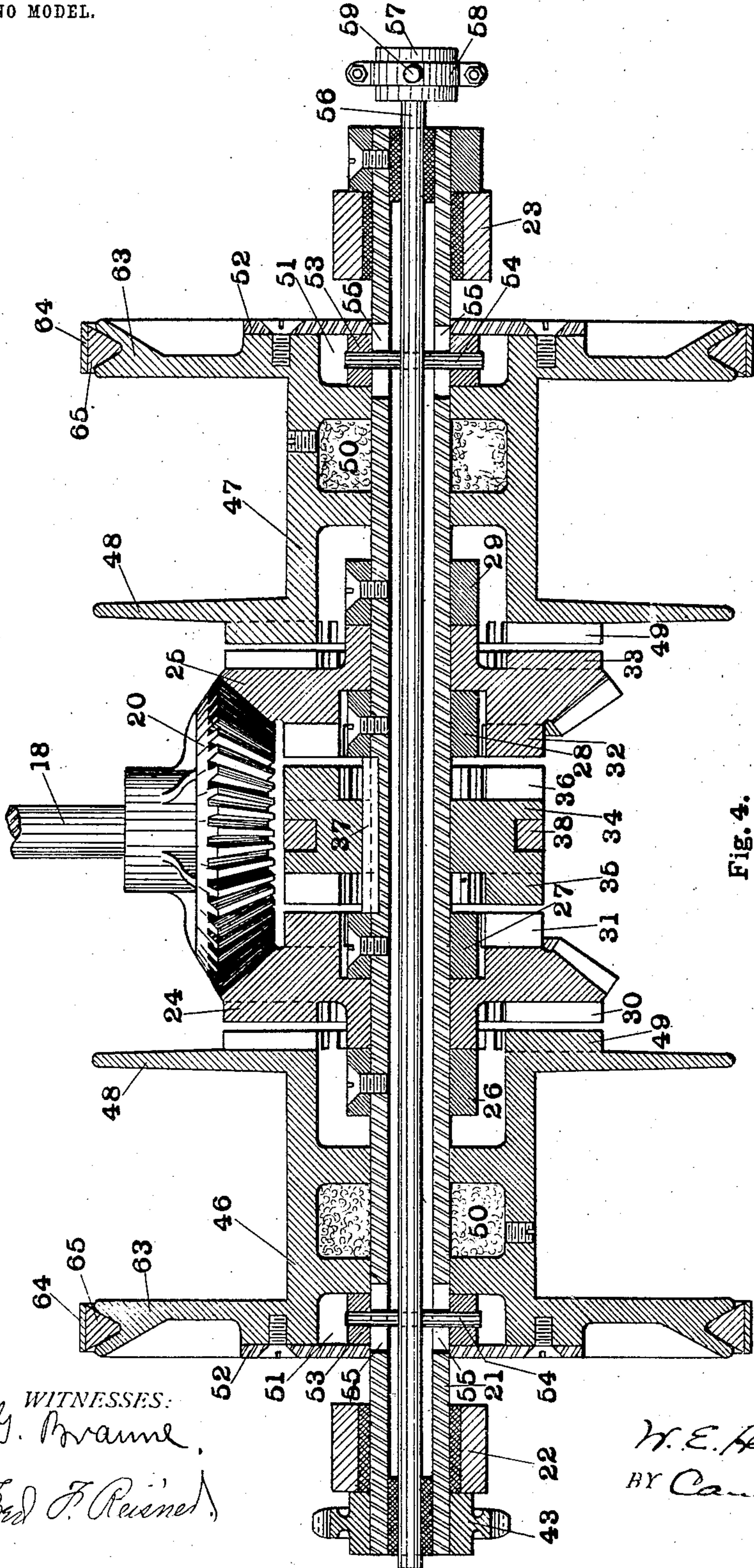


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM E. HAMILTON, OF ZANESVILLE, OHIO.

LOCOMOTIVE CAR-PULLER.

SPECIFICATION forming part of Letters Patent No. 765,833, dated July 26, 1904.

Application filed December 18, 1903. Serial No. 185,612. (No model.)

To all whom it may concern.

Be it known that I, WILLIAM E. HAMILTON, a citizen of the United States, of the city of Zanesville, county of Muskingum, and State of Ohio, have invented a new and useful Improvement in Locomotive Car-Pullers, of which the following is a specification.

My invention relates to mining machinery, and has for its principal objects to provide a transportable machine for handling mine-cars, to move mine-cars back and forth from the cross-entries of mines to the chamber thereof, to provide a car-puller that may be associated with a loading-machine, to provide a self-propelling or locomotive car-puller, and other objects hereinafter more fully appearing.

My invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a diagrammatic view of my improved car-puller, showing it applied to the "tail-rope" system of cable propulsion. Fig. 2 is a plan view of my improved car-puller, only a portion of the truck being shown. Fig. 3 is a side view of the parts shown in Fig. 2. Fig. 4 is a horizontal section through the cable-drums and associated parts. Fig. 5 is a side view of the anchor-clamp on an enlarged scale, and Fig. 6 is a rear view of the anchor-clamp.

In the usual plan of mines, especially coal-mines, a track 1 is laid in the cross-entry and a track 2 in the mine-chamber, the two tracks being connected by a switch and curve 3. A block 4, provided with one pulley, is secured near the center of the track 1 in the cross-entry. A second block 5, having two pulleys, is mounted substantially at the center of the curve 3. A rope or cable 6 runs over one pulley in the block 5, around the pulley in the block 4, and then over the other pulley in the block 5, the ends of the cable being connected to separate winding-drums. Intermediate its ends the cable 6 is provided with a hook 7, that is adapted to engage an eye 8 on the car. The cars are thus connected to the cable, so as to be moved in either direction.

The cable-driving mechanism is preferably mounted upon a self-propelling truck 9. A motor 10 of any desired type is mounted on the truck. Upon the end of the main shaft 11 of the motor a gear 12 is fixed, which meshes with a gear 13, fixed upon a shaft 14. A gear 15 is fixed upon the end of the latter shaft and meshes with a gear 16, connected to a clutch 17. This clutch 17, hereinafter called the "primary" clutch, is mounted upon a shaft 18, which it connects with the gear 16. A lever 19 is provided to manipulate the primary clutch 17. A bevel-gear 20, hereinafter called the "primary" bevel-gear, is fixed upon the shaft 18.

A hollow shaft 21 is journaled in bearings 22 23 on the truck. Bevel-gears 24 25, hereinafter called "secondary" bevel-gears, are loosely mounted on said hollow shaft in position to mesh with the primary bevel-gear 20. They are held in position by collars 26 27 28 29, fixed upon the shaft 21 by screws. Thus the primary bevel-gear may be allowed to run continuously without turning the shaft 21. The opposite faces of the secondary bevel-gears are provided with clutch-teeth 30 31 32 33. The secondary bevel-gears are thus combined clutch members and bevel-gears. It will be observed that the secondary bevel-gears rotate in opposite directions.

A clutch member 34, having clutch-teeth 35 36 on its opposite faces, is mounted on the shaft 21 between the secondary bevel-gears. It is longitudinally movable on said shaft, but is secured against rotation thereon by a feather 37. The clutch member is provided with a circumferential groove in which a collar 38 is located. A shifting-lever 39 is mounted on a bracket 40 and is provided with a slot 41, with which a pin 42 on the said collar 38 engages. By this means the clutch member may be moved either to right or left and brought into engagement with either of the secondary bevel-gears, and thus rotation of the shaft 21 in either direction may be produced.

A driving-sprocket 43 is fixed upon one end of the shaft beyond the bearing 22, a driven sprocket 44 is fixed upon one axle of the truck, and a sprocket-chain 45 connects the two sprockets. As the driving-sprocket may ro-

tate in either direction with its shaft, it follows that the truck may be propelled either forward or backward.

Winding-drums 46 47 are loosely mounted 5 on the shaft upon opposite sides of the secondary bevel-gears. These drums are alike. Each has a flange 48, provided with clutch-teeth 49 on the face adjacent its respective secondary bevel-gear. The hub of the drum 10 is recessed to provide a chamber 50 for a lubricant and to reduce the area of contact with the shaft. At the end each drum is provided with a recess 51, concentric with the shaft 21 and closed by a plate 52. In the groove thus 15 formed is a ring 53, which has a pin 54 therein projecting through oppositely-located slots 55 in the shaft. A shifting-rod 56 extends through the shaft and is connected with said pins 54 54. At one end the shifting-rod has a grooved cylindrical enlargement 57, which may be integral therewith or secured thereon. A split 20 ring 58 engages the groove and is provided with a pin 59. A shifting-lever 60 is pivoted on a bracket 61 and has a slot 62 in position 25 to be engaged by said pin 59. By the operation of the said shifting-lever 60 either drum may be connected to its respective secondary bevel-gear, and their connection is such that when one drum is connected the other is dis- 30 connected.

Means for braking the drums are provided. Each drum is provided with a grooved flange 63 at its outer end. A brake-belt 64, having 35 blocks 65 of complementary shape, engages the groove. A rock-shaft 66, journaled in bearings 67 68 on the truck, bears transverse arms 69 70, secured thereto at their centers. The ends of the brake-belts 64 64 are connected 40 to the arms 69 70, respectively. The transverse arms are set at an angle to each other, so that by moving the handle-lever 71 upwardly the brake will be set upon one drum and by moving it downwardly the brake will be set upon the other drum.

When the car-puller is located in position, 45 it is desirable to anchor it, as the tension on its cables produced by pulling the mine-cars tends to move it backward. Anchor-clamps 72, projecting rearwardly from the truck, are 50 provided. The clamp comprises a strut-bar 73, having an elongated slot 74 at one end. A rail-engaging foot 75, having downwardly-extending lateral flanges 76 77, extends from the other end at an angle to the body of the 55 bar. There is a fixed collar 78 intermediate the ends of the bar. Supported on the strut-bar above the collar are hooks 79 80, having eyes surrounding the bar and adapted to engage beneath the flange of the rail, as shown 60 in Figs. 5 and 6. At its upper end the strut-bar is connected to the truck by means of a pin 81, passing through the slot 74 and supported in the downwardly-extending portions of L-shaped plates 82 83, bolted to the truck. 65 This anchor-clamp when in position on the

rail is automatic in its action. When the truck moves forward, the strut-bar is permitted to assume a sharper angle with the track, and the hooks are released from engagement with the flange; but upon rearward 70 movement of the truck, due to friction of the foot upon the track, the hooks engage the flanges of the rails, the rail is clamped, and further rearward movement stopped. The anchor-clamp may be disengaged from the 75 rail by swinging the hooks outwardly from the rail, the eyes being large enough to permit this motion.

To support the anchor-clamp when out of use, a projecting plate 84 and hook 85 are 80 mounted upon the truck. The slot 74 permits longitudinal movement of the strut-bar 73 to bring the end thereof beneath the plate, as shown in dotted lines in Fig. 5. The foot of the strut-bar is provided with an eye 86, 85 which is engaged by the hook 85.

The mechanism has been shown mounted upon a truck. A loading-machine may be conveniently mounted upon the same truck. A shaft 87 may be connected with the load- 90 ing-machine, and thus the latter may be driven from the same motor that drives the mechanism hereinbefore described.

In operation the drums may be thrown out of gear with the secondary bevel-gears by 95 means of the shifting-lever 60. Then the clutch member 34 may be thrown into engagement with either of the secondary bevel-gears by means of the shifting-lever 39, and the truck may be propelled forward or back- 100 ward, as may be desired. When the machine has been brought to the desired position, the anchor-clamps may be released from the hooks 85 and allowed to clamp the track-rail. Then the clutch member 34 may be released from 105 its engagement with the secondary bevel-gear. To bring up a car, the drum 47 is thrown into gear with the secondary bevel-gear 25. The cable will then be wound up on the drum 47 and will be paid out from the drum 46. If 110 the latter reels off too rapidly, its speed can be controlled by means of the brake. To remove the car, the shifting-lever 60 is operated, and the drum 47 is thrown into gear with the secondary bevel-gear 24, and the drum 46 is 115 thrown out of gear with its secondary bevel-gear. The cable will now be wound up on the drum 47 and paid out from the drum 46.

When it is desired to move the car-puller farther into the mine-chamber, it is only nec- 120 essary to throw both winding-drums out of gear and the clutch member 34 into gear. Then as the machine moves forward the required additional length of cable will be paid out from both drums. The machine is thus 125 ready for operation as soon as it reaches its new position, and it is unnecessary to change any of the cable connections.

Obviously the machine admits of considerable modification within the scope of my in- 130

vention, and therefore I do not wish to be limited to the specific construction shown and described.

What I claim is—

5 1. A car-puller comprising actuating mechanism and winding-drums arranged to be alternately operatively connected to said actuating mechanism.

10 2. A car-puller comprising actuating mechanism, winding-drums, and means to alternately operatively connect said drums to said actuating mechanism.

15 3. A car-puller comprising actuating mechanism, winding-drums, and means to alternately connect said drums to said actuating mechanism, said drums being rotated in opposite directions.

20 4. A car-puller comprising actuating mechanism, clutch members operatively connected thereto, and winding-drums arranged to be alternately operatively connected to said clutch members, respectively.

25 5. A car-puller comprising actuating mechanism, a hollow shaft, a clutch member rotatably mounted upon said shaft, a winding-drum rotatably mounted upon said shaft and provided with clutch-teeth, and a shift-rod within said hollow shaft arranged to throw said clutch member and drum into and out of
30 gear with each other.

35 6. A car-puller comprising actuating mechanism, winding-drums, means connecting said actuating mechanism and winding-drums to drive the latter in opposite directions, and a cable having its ends wound upon said drums, respectively.

40 7. A car-puller comprising actuating mechanism, winding-drums arranged to be alternately operatively connected thereto, and brakes upon said drums arranged to be alternately set.

45 8. A car-puller comprising actuating mechanism, winding-drums arranged to be alternately operatively connected thereto, and brakes upon said drums so connected that when one brake is set the other is released.

50 9. A car-puller comprising actuating mechanism, winding-drums arranged to be alternately operatively connected to said actuating mechanism, a rock-shaft, transverse arms upon said rock-shaft set at an angle to each other, and brakes upon said drums connected to said transverse arms, respectively.

55 10. A car-puller comprising a truck, actuating mechanism mounted thereon, winding-drums arranged to be alternately operatively connected to said actuating mechanism, and driving mechanism for said truck arranged to be operatively connected to said actuating
60 mechanism.

11. A car-puller comprising a truck, actuating mechanism mounted thereon, a winding-drum arranged to be releasably connected to said actuating mechanism, driving mechanism
65 for said truck, and means to operatively con-

nect said driving mechanism to said actuating mechanism to actuate driving mechanism in either direction.

12. A car-puller comprising a truck, actuating mechanism thereon, a clutch member
70 having clutch-teeth upon its opposite faces and operatively connected to said actuating mechanism, a winding-drum and driving mechanism for said truck arranged to be releasably connected to said clutch member. 75

13. A car-puller comprising a truck, actuating mechanism thereon, clutch members having clutch-teeth upon their opposite faces operatively connected to said actuating mechanism, winding-drums arranged to be alternately operatively connected to said clutch
80 members, respectively, and driving mechanism arranged to be alternately operatively connected to said clutch members.

14. A car-puller comprising a truck, actuating mechanism thereon having a primary
85 bevel-gear, secondary bevel-gears in engagement with said primary bevel-gear and having clutch-teeth upon their opposite faces, driving mechanism for said truck arranged to
90 be alternately operatively connected to said secondary bevel-gears, and winding-drums arranged to be alternately operatively connected to said secondary bevel-gears, respectively. 95

15. A car-puller comprising a truck, a hollow shaft mounted thereon, winding-drums rotatably mounted on said shaft, a shift-rod within said shaft operatively connected to said drums, gear-wheels having clutch-teeth upon
100 their opposite faces rotatably mounted on said shaft, a clutch member non-rotatably but slidably mounted on said shaft, means to operate said clutch member, a sprocket rigidly mounted upon said shaft and operatively connected
105 to a wheel of said truck, and actuating mechanism operatively connected to said gear-wheels.

16. A car-puller comprising a truck, actuating mechanism thereon, clutch members
110 operatively connected to said actuating mechanism to rotate in opposite directions, and driving mechanism for said truck arranged to be alternately operatively connected to said clutch members. 115

17. A car-puller comprising a truck, actuating mechanism thereon, driving mechanism having a shaft and a clutch member having
120 teeth upon its opposite faces slidably mounted upon said shaft, clutch members rotatably mounted upon said shaft and operatively connected to said actuating mechanism, and means to throw said first-mentioned clutch member into gear with either of said second-mentioned clutch members. 125

18. A car-puller comprising a truck, actuating mechanism thereon, a winding-drum arranged to be actuated by said actuating mechanism, and an automatic anchor-clamp on said truck arranged to clamp a track-rail upon
130

movement of the truck in one direction and to be released upon movement in the opposite direction.

5 19. A car-puller comprising a truck, actuating mechanism thereon, driving mechanism for said truck and a winding-drum arranged to be actuated by said actuating mechanism, and an anchor-clamp on said truck adapted to clamp a track-rail.

10 20. A car-puller comprising a truck, actuating mechanism thereon, a winding-drum arranged to be actuated by said actuating mechanism, and an automatic anchor-clamp on said truck having a strut-bar longer than the ver-
15 tical distance from its point of support to the track-rail and flange-engaging means on said strut-bar.

20 21. A car-puller comprising a truck, actuating mechanism thereon, a winding-drum arranged to be actuated by said actuating mechanism and an automatic anchor-clamp on said truck having a strut-bar longer than the ver-

tical distance from its point of support to the track-rail and flange-engaging means pivotally mounted on said strut-bar. 25

22. A car-puller comprising a truck, actuating mechanism thereon, a winding-drum arranged to be actuated by said actuating mechanism and an automatic anchor-clamp on said truck comprising a strut-bar pivotally con- 30 nected to said truck, having a laterally-flanged foot-piece making an obtuse angle therewith and adapted to engage the top of a track-rail, a collar on said strut-bar intermediate its ends, and hook members freely mounted upon said 35 strut-bar above said collar and adapted to engage the head-flanges of a track-rail.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. HAMILTON.

Witnesses:

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