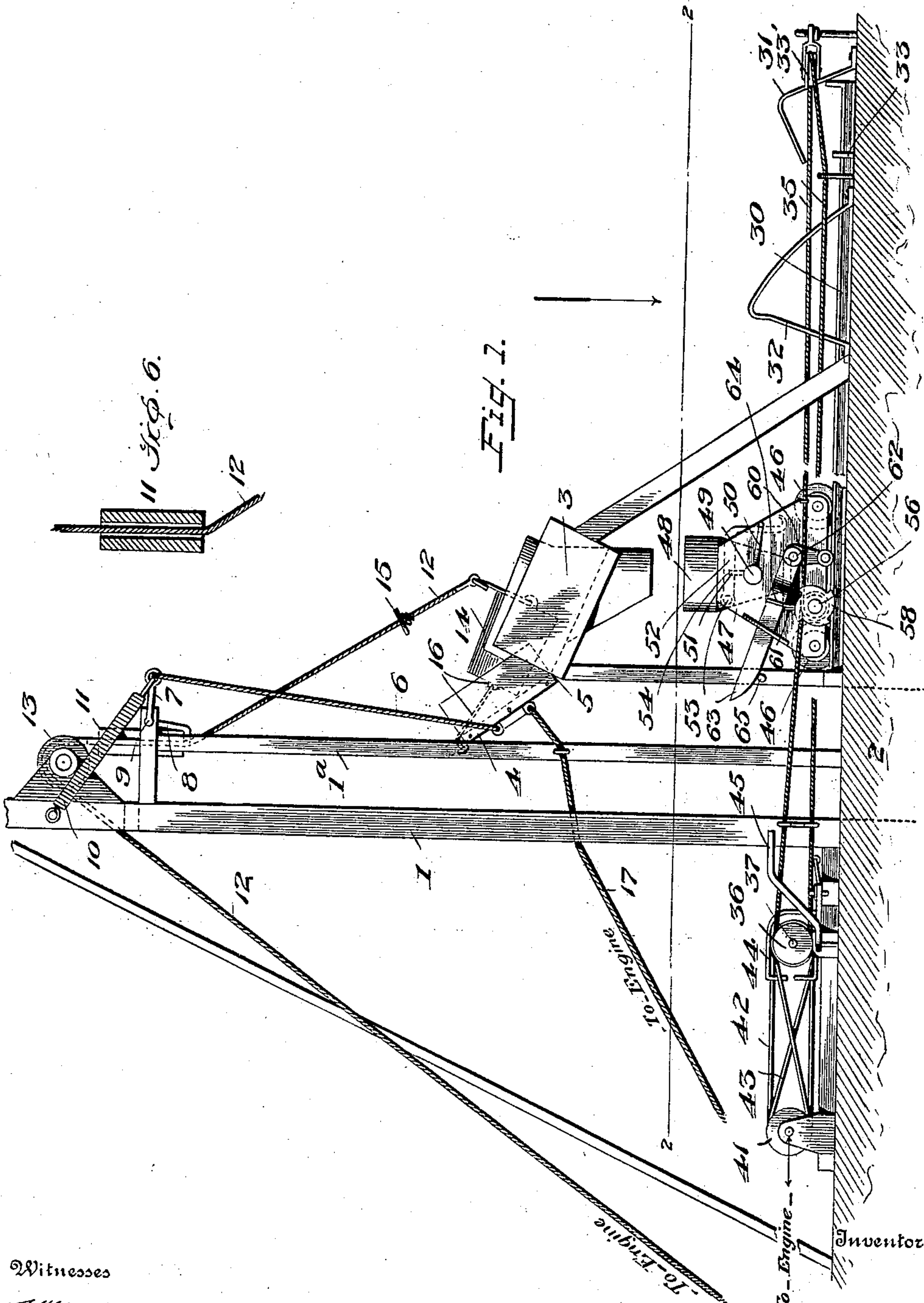


No. 886,959.

H. G. DIFFENBAUGH. PATEL
AUTOMATIC CARRIER AND DUMPER.

APPLICATION FILED JULY 31, 1907.

3 SHEETS—SHEET 1.



Witnesses

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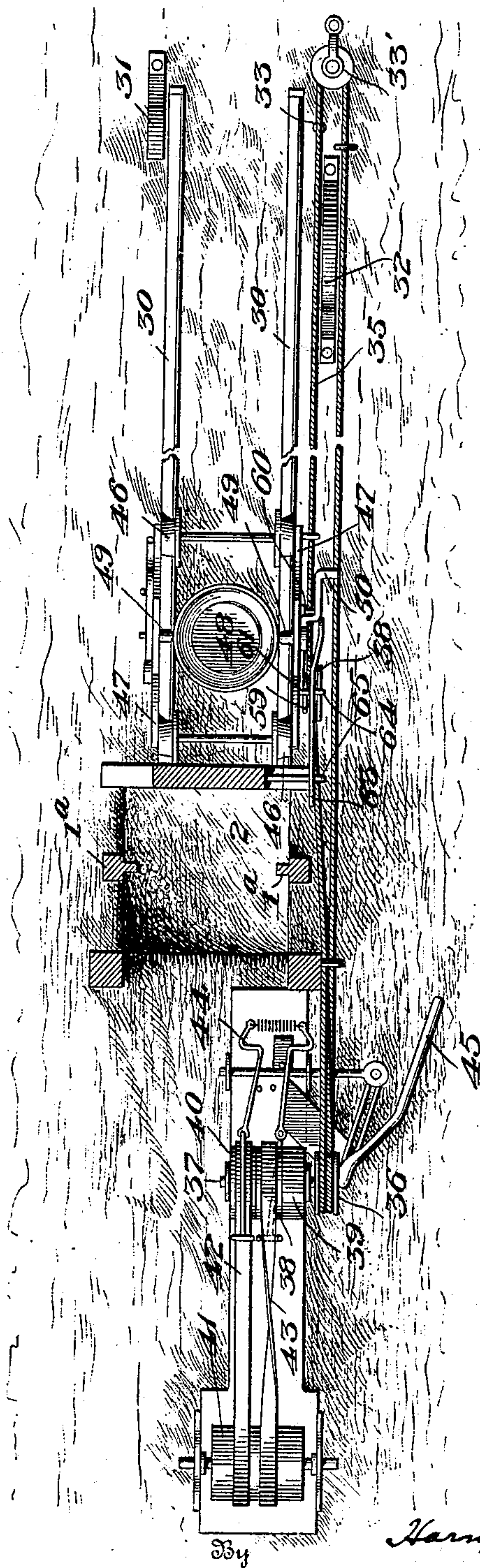
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

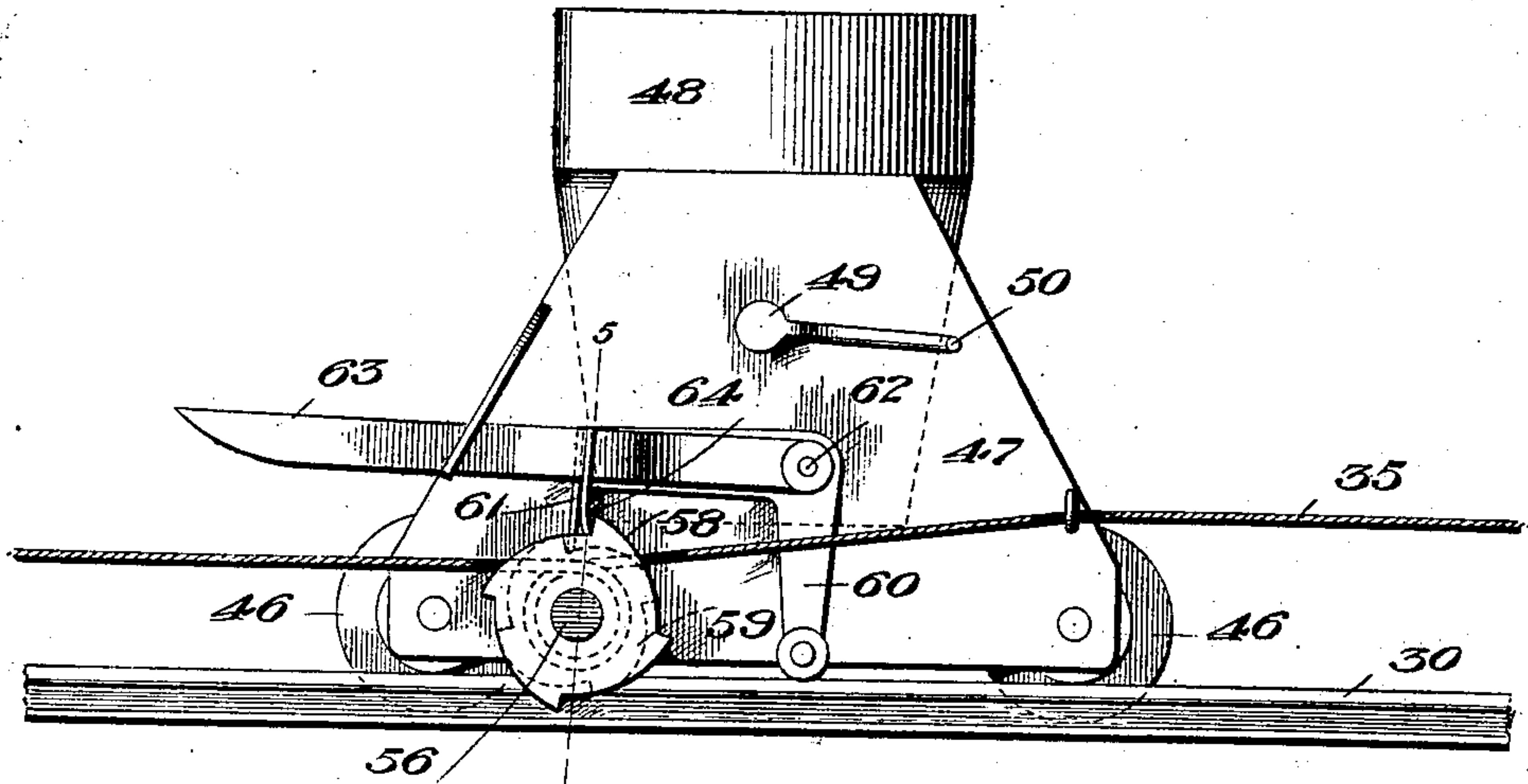
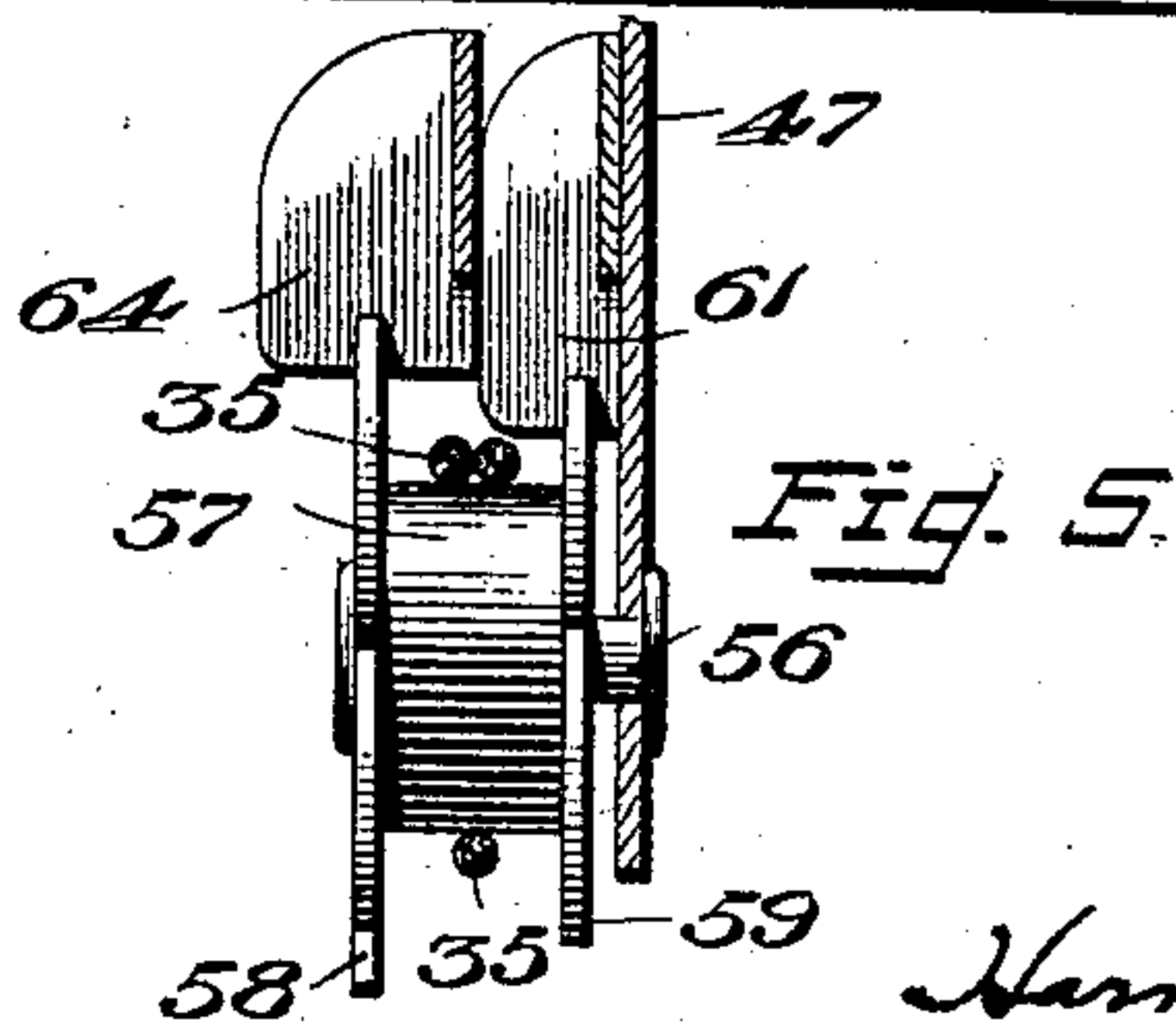
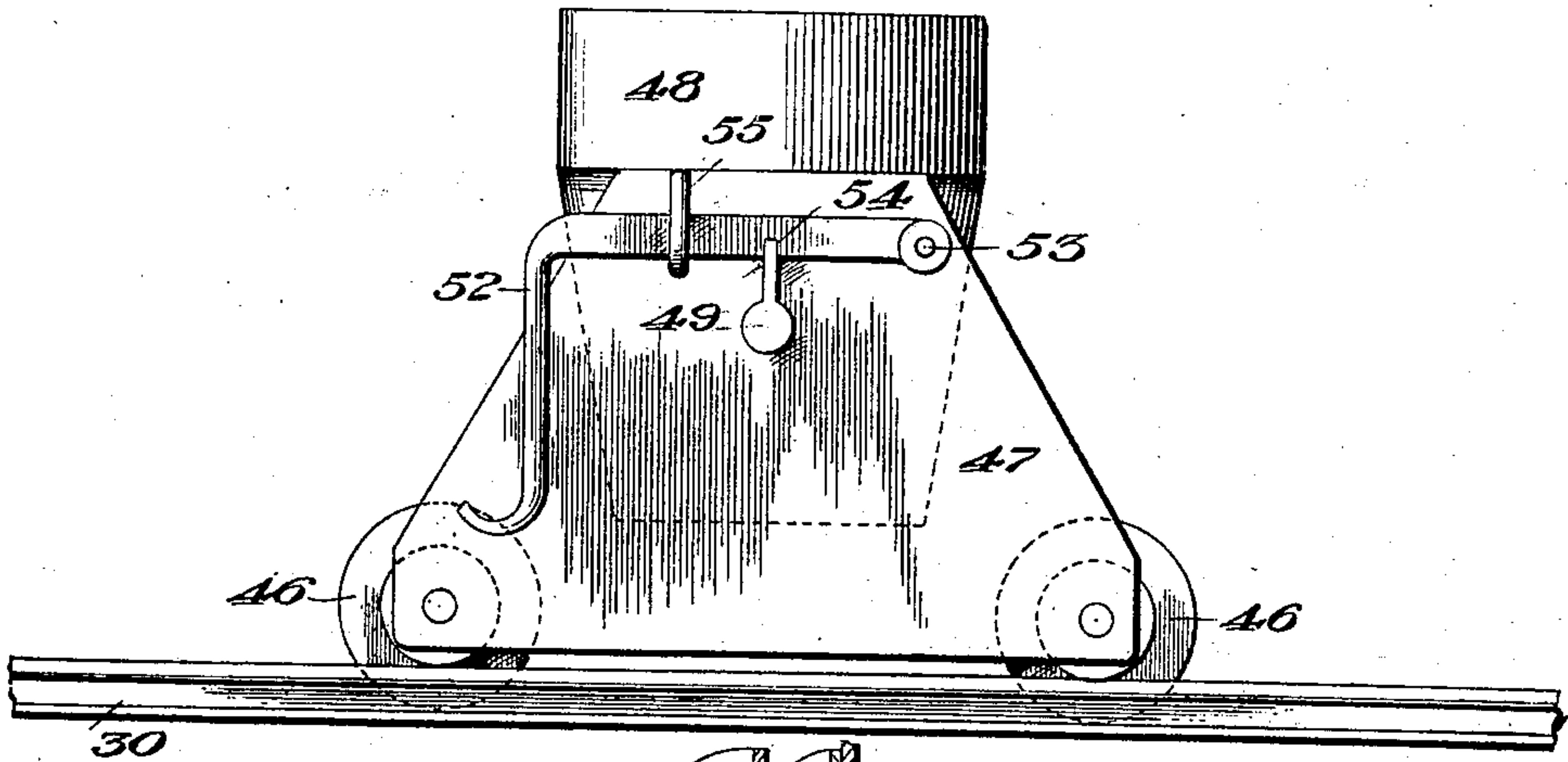


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

HARRY G. DIFFENBAUGH, OF GOLDFIELD, NEVADA.

AUTOMATIC CARRIER AND DUMPER.

No. 886,959.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed July 31, 1907. Serial No. 386,483.

To all whom it may concern:

Be it known that I, HARRY G. DIFFENBAUGH, a citizen of the United States, residing at Goldfield, county of Esmeralda, and State of Nevada, have invented certain new and useful Improvements in Automatic Carriers and Dumpers, of which the following is a specification.

My invention relates to automatic carriers and dumpers for mines.

The invention has for its object the provision of an automatically acting dump car and associated apparatus of novel construction adapted for use at the mouth of mines which will be arranged to receive the ore fed thereto by the bucket, crotch-board, and hopper ordinarily employed, and, under the control of the engineer, automatically carry the ore to the end of the dump and automatically dumps the content of the car without further attention on the part of the engineer or any one else and which will, under the control of the engineer, automatically right itself and return to position at the mouth of the mine for the reception of another charge of ore and automatically stop itself when in such receiving position, thereby obviating the necessity of employment of an extra hand now used to look after the car.

The present invention is so constructed and operates in such fashion that the cable for pulling the dump car to and fro may run continuously without any attention on the part of the engineer, danger to the engine or breakage of the car or interfering with its action, which is wholly automatic at the end of the dump and when at the mouth of the mine.

The invention also contemplates the provision of a novel cross-head supporting device used in connection with the bucket and the crotch-board.

The invention is set forth fully hereinafter and its novel features and arrangements and combination of parts are recited in the appended claims.

In the accompanying drawings:—Figure 1 is a side view showing the equipment in connection with the gallows frame of a mine; Fig. 2 is a plan view with the framing in section on line 2—2 of Fig. 1; Figs. 3 and 4 are opposite detail side views of the car; Fig. 5 is an enlarged detail section on line 5—5 of Fig. 3; and Fig. 6 is a detail section of the cross head.

The gallows frame 1 arises around the mine shaft 2, as usual, there being a hopper 3, a crotch board 4 which is pivoted at 5, and a cable 6 which is connected to one arm 7 of a double lever having another arm 8, arranged at right angles to arm 7 and provided with a bent end, said lever being pivoted at 9 to the frame. A coil spring 10 tends to hold the parts in the position shown in Fig. 1.

There is a cross-head 11 which slides vertically on ways 1^a of the frame 1, and a hoisting cable 12 which runs to the engine, passes over a pulley 13 and passes loosely through the cross-head and is connected to the ore bucket 14, a button 15 being provided to abut the lower part of the cross-head 11. The bucket has a tail piece 16 to catch in the crotch-board in a well known fashion to cause the bucket to dump into the hopper 3. The crotch board is normally held in a more or less raised position by the lifting action of spring 10 but is adapted to be pulled downwardly to be made to catch the tail piece 16 by a rope 17 under the control of the engineer.

Before proceeding with the description of the automatic carrier and dump car, explanation of the action of the bucket and other parts just described will be given.

The bucket is hoisted sufficiently high for the cross-head 11 to rise above the lever 8. The engine is then stopped and the engineer pulls rope 17 bringing the crotch board 4 into lowered position and causing the bent end of lever 8 to catch under the cross-head 11 and support it. The engine is then reversed to lower the bucket, and the tail piece 16, catching in the crotch board causes the bucket to fall to the position shown in Fig. 1 and dump its ore into the hopper 3, whence it falls to the car. The engine is then started ahead and the bucket raised until button 15 is against the cross-head whereupon the engine is stopped and the engineer releases rope 17 and the spring 10 then draws the crotch board into raised position and releases cross-head 11 which, with the bucket, may then be lowered into the shaft. The ways 1^a and the cross head guide the bucket and prevent it from striking the sides of the shaft.

Extending out to any desired distance from the mouth of shaft is a track 30, at the outer end and on one side of which is a trip 31 while on the other side is a righter 32 and a trip 33. A sheave 33' is located at the end

of the track and around this sheave passes the operating cable 35 which also passes twice around a drum 36 on a shaft 37 which has a central fixed pulley or drum 38 and loose pulleys 39 and 40. A drum 41, which is driven in any suitable manner from the engine, is connected to the pulleys 38, 39, 40, by two belts 42 and 43, the latter being twisted. A belt shifter is employed so that the engineer may keep the belts on the pulleys 38 and 39 or on pulleys 38 and 40; any preferred type of belt shifter may be used. I have shown a belt shifter 44 controlled by a lever 45.

The car which travels on track 30, has wheels 46 and suitably constructed sides 47 between which the dumping body 48 is hung on pivots 49. Referring first to Fig. 3, one of the pivots 49 has a righting arm 50 which is adapted to engage the righter 32 on the return movement of the car. The other pivot has a finger 51 (Fig. 4). A locking lever 52 is pivoted at 53 and has a notch 54 to receive the finger 51 to hold the car body 48 in upright position, a stop 55 preventing dropping of the lever from the position shown in Fig. 4. This lever 52 is adapted to engage the trip 31 and as the car body 48 is hung so that it is "over balanced", the body will tilt and discharge its load as soon as it is released.

Referring particularly to Figs. 3 and 5, there is provided on the side of the car a stub-shaft 56 on which is loosely mounted a drum 57 which carries ratchet wheels 58 and 59 whose inclines and teeth or shoulders point in opposite direction so that one of the ratchet wheels is effective when the drum is turned in one direction and the other ratchet wheel is effective when the drum is turned in the opposite direction. The cable 35 passes one or more times around the drum 57, hence movement of the cable tends to turn the drum 57 in one direction or the other according to the direction in which the cable is being turned which is, in turn, controlled by shifting the belts 42 and 43.

Pivoted to the side of the car is a bell crank lever 60 having a pawl 61 adapted to engage the ratchet wheel 59. The depending part of the lever 60 is positioned to be engaged by trip 33 and this action throws the pawl 61 out of engagement with ratchet wheel 59, so that the car thereupon will stop although the cable may still run and in so doing idly turn the drum 57. Pivoted on the same pivot 62 as that of the lever 60, is another lever 63 which has a pawl 64 adapted to engage the ratchet wheel 58. This lever and pawl ride idly up and down when the drum is being turned by cable 35 after the lever 60 has been tripped but immediately the direction of rotation of the cable is reversed, the pawl 64 positively engages ratchet wheel 58 and hence the car will be pulled backwardly toward the shaft of the

mine. In so doing the righting lever 50 will ride upon the righter 32 and restore the car body 48 to upright position and it will then be automatically latched by the finger 51 engaging notch 54. When the car arrives at the position shown in Fig. 1, the lever 63 strikes a trip pin 65 and is raised so that the pawl 64 is disengaged from the ratchet wheel 58 and the car stops, the pawl 61 riding idly up and down if the cable 35 continues to travel. Thus, at the ends of the track 30, the car will remain stationary even though the cable be running.

Briefly described, the operation is as follows: When the upper strand of the cable is traveling to the right of Fig. 1, the engagement of pawl 61 with ratchet wheel 59 will cause the car to travel to the end of the track and when the lever 52 strikes the trip 31, the car automatically dumps itself and the lever 60 is also tripped. The car remains stationary until the direction of travel of the cable is reversed, whereupon the pawl 61 rides idly and the pawl 64 engages ratchet wheel 58. The car then travels toward the mine shaft and the lever 50 striking righter 32 restores the car body 48 to upright position where it is locked. When the lever 63 strikes the trip 65 the pawl is released from ratchet wheel 58 and the car stops.

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

1. In an automatic carrier, the combination with a carrier adapted for to-and-fro travel, of means for traveling said carrier back and forth, and means for automatically stopping said carrier at the respective limits of its to-and-fro travel without interfering with the operation of said means for traveling the carrier.

2. In an automatic carrier and dumper, the combination with a dumping carrier adapted for to-and-fro travel, of means for traveling said carrier back and forth, means for automatically stopping said carrier when it has reached dumping position, means for automatically dumping the carrier when in dumping position, and means for automatically restoring the carrier to normal position after dumping.

3. In an automatic carrier and dumper, the combination with a dumping carrier adapted for to-and-fro travel, of means for traveling said carrier back and forth, means for automatically stopping the carrier at the respective limits of its to-and-fro travel, means for automatically dumping the carrier when in dumping position, and means for automatically restoring the carrier to normal position after dumping.

4. In an automatic carrier, the combination with a carrier adapted for to-and-fro travel, of a cable for traveling said carrier back and forth, and means for automatically

stopping the carrier at a predetermined point of its travel without interfering with the movement of the cable.

5. In an automatic carrier, the combination with a carrier adapted for to-and-fro travel, of a cable for traveling said carrier back and forth, and means for automatically stopping the carrier at the respective limits of its travel without interfering with the movement of the cable.

6. In an automatic carrier, the combination with a carrier adapted for to-and-fro travel, of a drum carried thereby, a pawl and ratchet mechanism controlling the rotation of the drum, a cable cooperating with the drum to propel the carrier, and means for throwing the pawl and ratchet mechanism out of action to stop the travel of the carrier.

7. In an automatic carrier, the combination with a carrier adapted for to-and-fro travel, of a drum carried thereby, two sets of pawl and ratchet mechanism respectively controlling the rotation of the drum in opposite directions, a cable cooperating with the drum to propel the carrier, and means for

throwing the respective pawl and ratchet mechanisms out of action at desirable positions of travel of the carrier to stop said carrier.

8. In a hoist and dump mechanism, the combination with a raising and lowering cross-head, guides therefor, a hoisting cable cooperating with said cross-head when traveling in one direction and free therefrom when traveling in the other direction, a bucket or the like connected to said cable, a movable dumping chute adapted for positioning to engage with the bucket to dump the latter, spring actuated means adapted for engagement with the cross-head to hold it in raised position, and an operative connection between the said spring actuated means and the dumping chute.

In testimony whereof, I hereunto affix my signature in presence of two witnesses.

HARRY G. DIFFENBAUGH.

Witnesses:

GEORGE L. DIFFENBAUGH,
W. W. STUART.