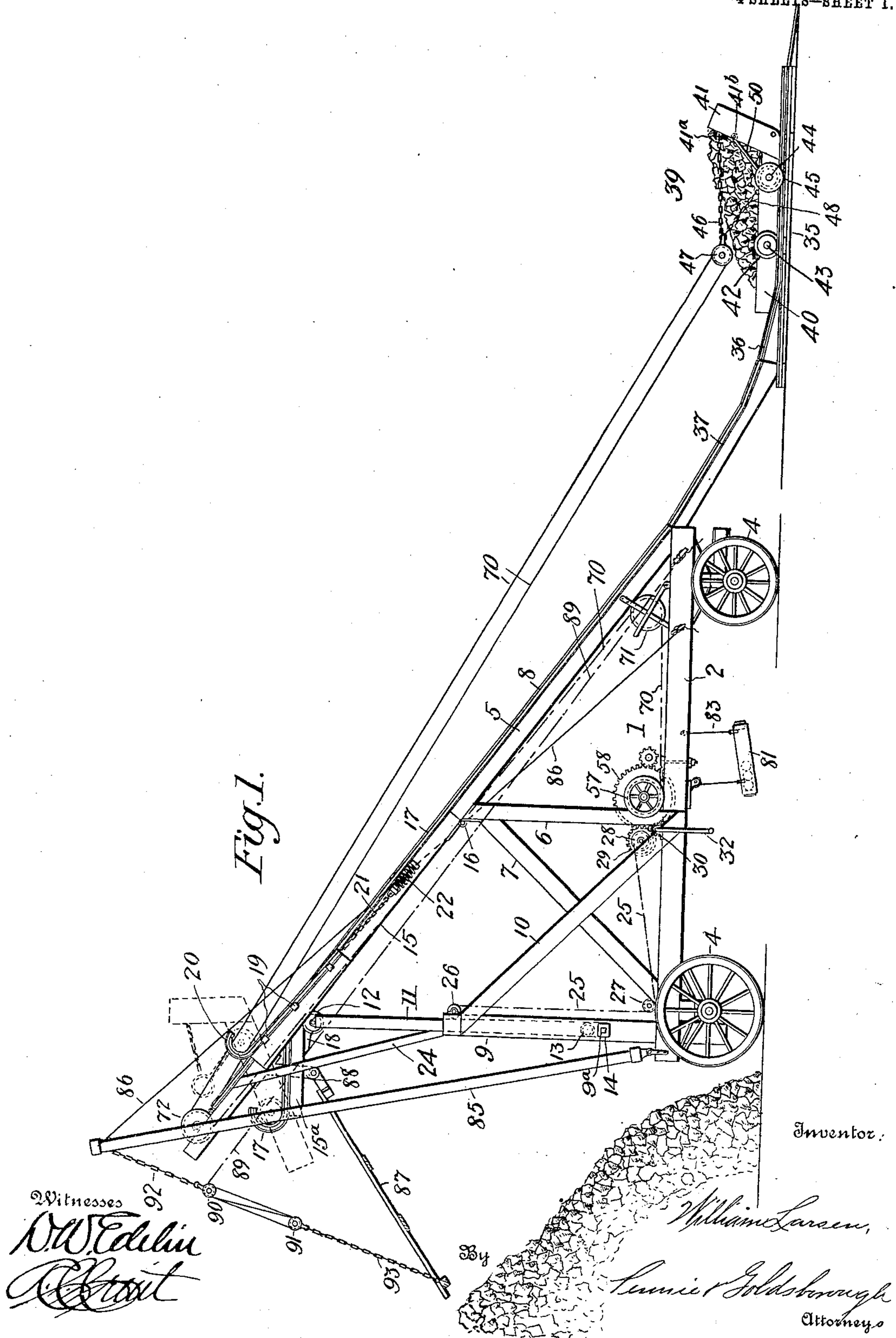


938,879.

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Patented Nov. 2, 1909.

4 SHEETS--SHEET 1.



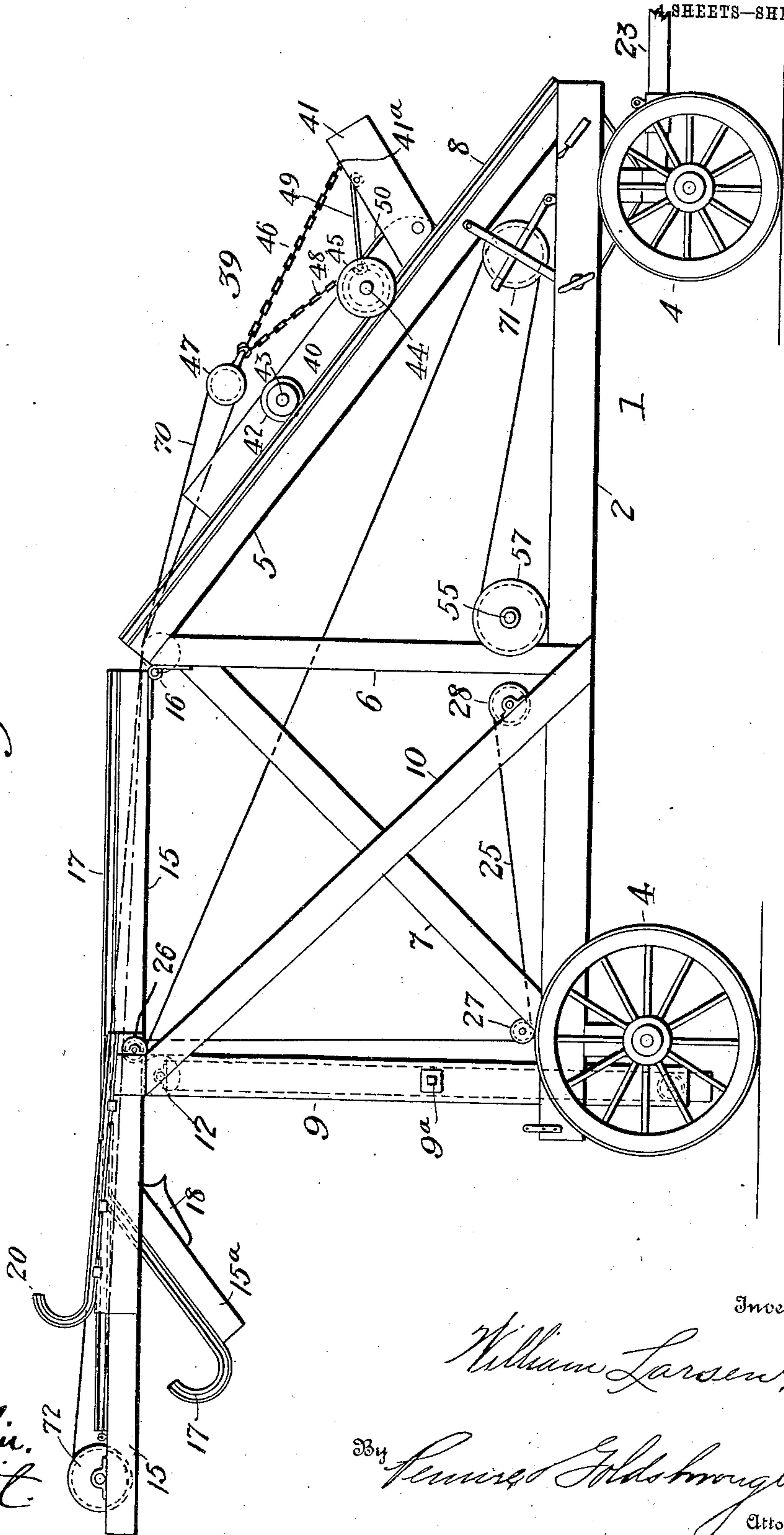
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Fig. 2.



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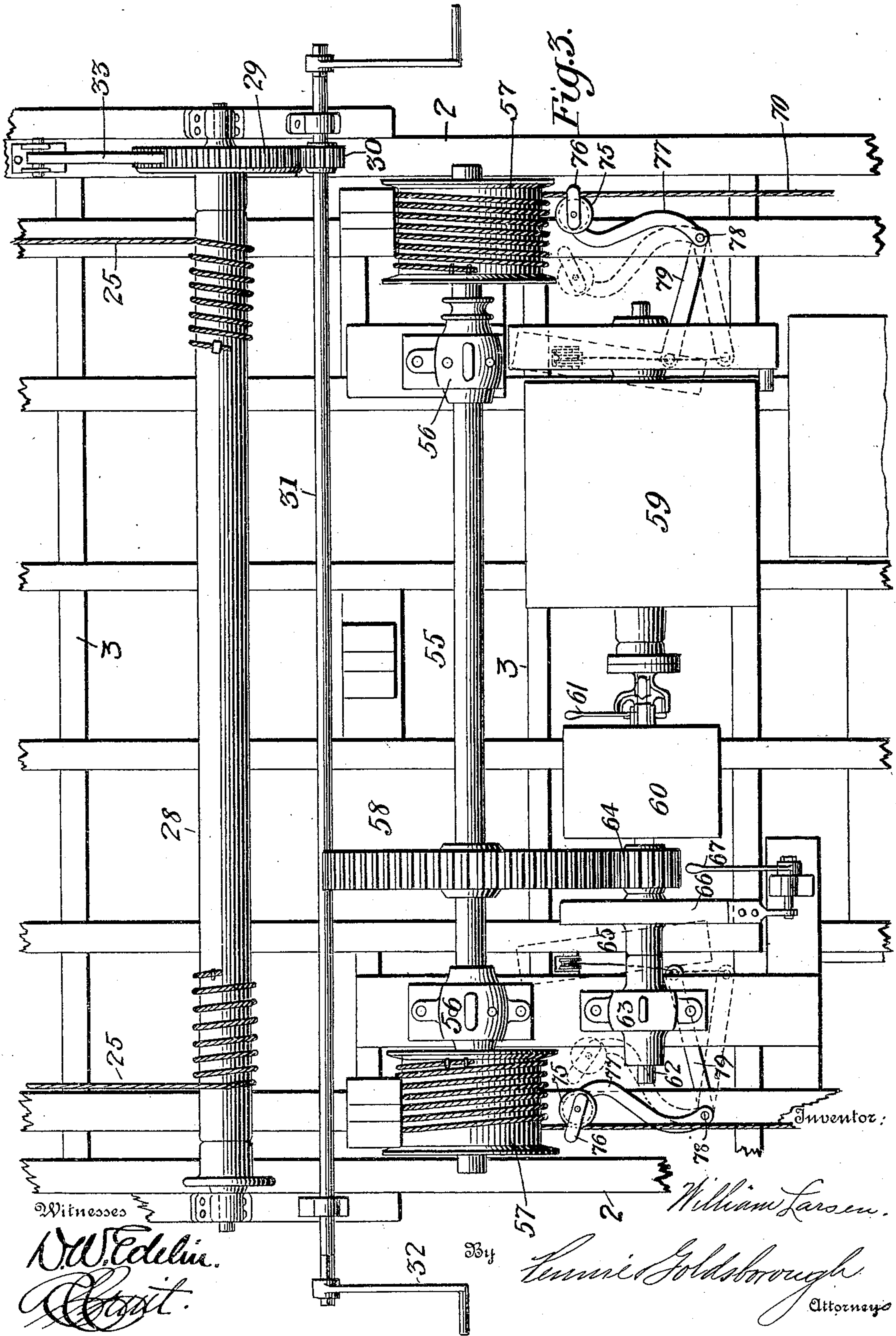
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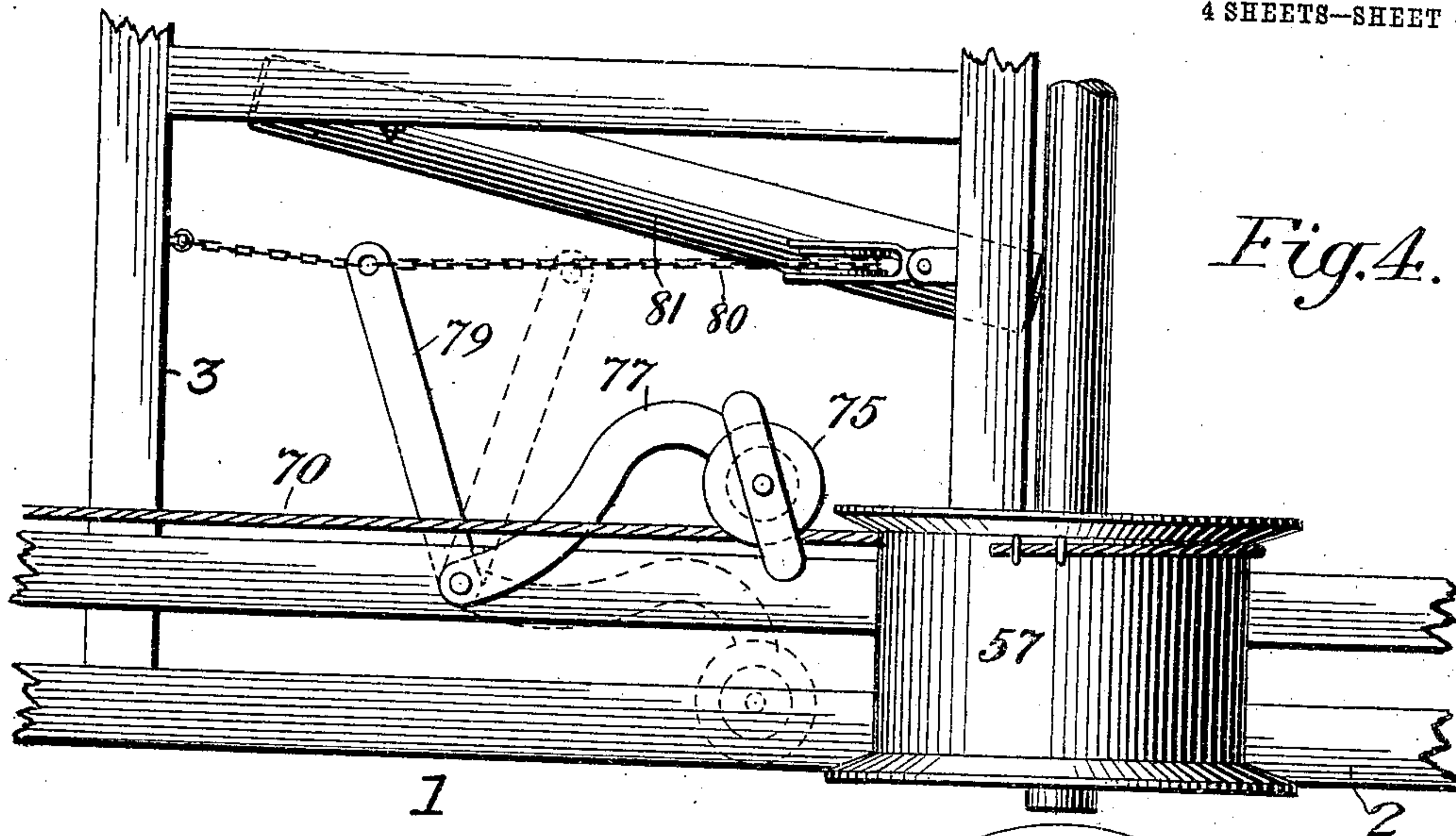
Patented Nov. 2, 1909.  
 4 SHEETS—SHEET 3.



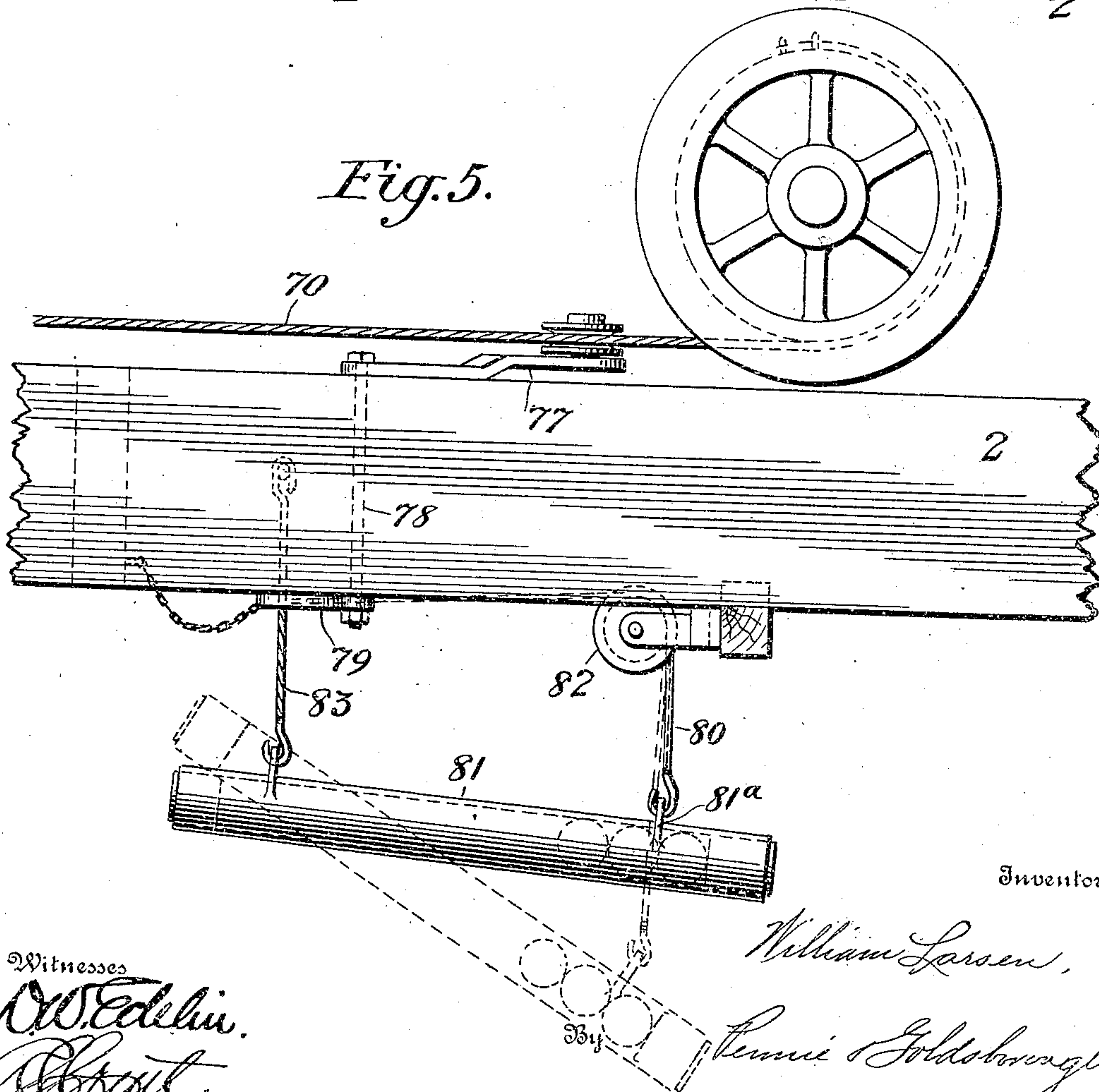
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4 SHEETS—SHEET 4.



*Fig. 4.*



*Fig. 5.*

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# UNITED STATES PATENT OFFICE.

WILLIAM LARSEN, OF HONOLULU, TERRITORY OF HAWAII.

## APPARATUS FOR LOADING COAL.

938,879.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed April 9, 1907. Serial No. 367,293.

*To all whom it may concern:*

Be it known that I, WILLIAM LARSEN, a citizen of the United States, residing at Honolulu, county and Island of Oahu, Territory of Hawaii, have invented a new and useful Apparatus for Loading Coal, of which the following is a specification.

My invention relates to that class of apparatus used for receiving loose material and raising the same to a suitable elevation and then dumping the same; and particularly to apparatus adapted to handle coal or the like, receiving a load dumped from a cart or wagon, and elevating and automatically dumping the same, for example, into a bin or onto a vessel or scow.

The object of my invention is to produce an apparatus of this character which shall be portable, easily manipulated, and rapidly and economically operated.

The invention consists in the novel construction and arrangement of parts herein-after fully described and claimed, reference being had to the accompanying drawings, in which corresponding parts are indicated by similar characters of reference, in which—

Figure 1 is a side elevation of an apparatus in its working position for loading coal or the like constructed in accordance with this invention. Fig. 2 is a side elevation of the same in position for being moved. Fig. 3 is a plan view of a portion of the body of the apparatus showing winch and motor operating mechanism. Fig. 4 is a plan and Fig. 5 an elevation of a portion of said body showing automatic guide for wire rope on winding drum.

The body 1 of the apparatus is composed of longitudinal sills 2 and transverse pieces 3 securely fastened together and mounted upon wheels 4 in a well known manner. Inclined beams 5 are secured at their lower ends to the forward corners of the body 1. and their upper ends are rigidly supported by the posts 6 with the braces 7. Each of the beams 5 supports a rail 8 forming the track of the rigid section of the runway. Vertical sleeves 9 are secured near the two rear corners of the body 1, their upper portions being braced by the braces 10. A bar 11, provided with a wheel 12 on its upper end, and a sheave 13 at its lower end, slides in

each of the sleeves 9. Each of the sleeves 9 is provided with a hole 9<sup>a</sup> through which a pin 14 is inserted for the bar 11 to rest upon when in the working position, Fig. 1.

The hinged portion of the inclined runway is composed of a frame 15 hinged by the hinges 16 to the upper ends of the posts 6, and is provided with rails 17 forming a track of the same gage as that of the rails 8. The side beams of the frame 15 rest upon the wheels 12 on the bars 11, and in the working position these wheels 12 also engage the blocks 18 secured to the underside of the depending beams 15<sup>a</sup> of the frame 15. The rails 17 are fastened to the upper surface of the side beams of the frame 15, and at a point nearly above the wheels 12 they are bent downward so as to be approximately level when in the working position. The rear ends of these rails 17 are curved upward and the level portions are supported by the beams 15<sup>a</sup> as shown. Guides 19 are attached to each side of the frame 15, in which a short rail 20 slides. The gage of the short track formed by the rails 20 is slightly wider than that of the rails 17. The upper ends of the rails 20 are also curved upward and their lower ends are each connected by a chain 21 to a tension spring 22 secured to the frame 15, Fig. 1. A brace 24 may be added at each side of the frame 15 with its lower end bolted to the top of sleeve 9, to further support said frame as shown in Fig. 1.

A pole 23 is provided (Fig. 2) for transporting the apparatus by attaching horses to same.

A wire rope 25, with one end attached to the upper portion of the sleeve 9, passes downward around the sheave 13 and then upward and over a sheave 26 at the upper end of each sleeve 9. Each wire rope 25 is then led around a sheave 27 and wound upon a drum 28 to which the other ends of said ropes 25 are fastened. The drum 28 is journaled transversely upon the body 1, and is provided with a gear 29 meshing with the pinion 30 on the shaft 31 operated by the hand crank 32, Fig. 3. A pawl 33, when engaging the teeth of the gear 29, holds the drum 28 in any desired position.

A low portable platform 35, provided with rails 36 of the same gage as the track formed



by the rails 8, is placed on the ground in front of the forward end of the body 1. A short inclined track 37 connects the ends of the rails 36 with the ends of the rails 8, to complete the runway, Fig. 1.

A carriage 39, for receiving, elevating and then dumping the load, is preferably made of two steel plates with bent up sides 40 and 41 hinged together and supported by the wheels 42 on the axles 43 and 44 attached to the telescoping sides of the longer plate 40. Said wheels 42 are adapted to run on the track formed by the rails 36, 37, 8 and 17 respectively of the runway. The axle 44 is provided with a wheel 45 on each end outside of the wheel 42. One end of a chain 46 is attached at 41<sup>a</sup> to the side of the plate 41 and the other end of said chain is linked to the block 47. A shorter similar chain 48 connects said block 47 and the side of the plate 40. A hinged brace with hook end 49 is hinged at 41<sup>b</sup> to the side of the plate 41, its hook end resting upon the piece 50 attached to the side of the plate 40. When the plate 41 is swung upward on its hinges, the hook of the brace 49 slides rearward on said piece 50 and drops into a slot in same when the extreme upward position is reached shown in Figs. 1 and 2. The arrangement of the chains 46 48 block 47 brace 49 and piece 50 is similar on both sides of the carriage 39.

A drum shaft 55 is journaled in the boxes 56 transversely on the body 1, Fig. 3. A spur gear 58 and two flanged drums 57 are keyed to said shaft 55. A gasoline engine or other motor 59 is mounted upon the body 1 and connected by a friction clutch coupling 60, operated by a lever 61, to the shaft 62 journaled in the box 63. The shaft 62 is provided with a pinion 64, meshing with the gear 58, and with a brake-disk 65. A brake-band 66, operated by the lever 67, engages said disk 65. A wire rope 70 is attached to each drum 57 and led around a sheave 71, in each crotch formed by the beams 5 and the body 1, and then upward and over a sheave 72 mounted at the upper end of the frame 15, thence over the block 47 of the carriage 39 and back to the rear of frame 15 to which the end of each rope 70 is secured.

A small sheave 75 and a U strap 76 on the end of a lever 77, respectively engages and encircles each rope 70 in front of each drum 57, Fig. 3. The other end of each lever 77 is fitted on the upper squared end of a bolt 78 passing through a hole in a sill 2 of the body 1. A lever 79 is fitted on the lower squared end of said bolt 78 below said sill, Figs. 4 and 5. A rope or small chain 80, attached to a weight 81, passes over a sheave 82 and is fastened to the other end of the lever 79. The end of said rope 80 is attached to a transverse piece 3 of the body 1, so as to limit the movement of the levers

79 and 77 to the position shown by dotted lines in Fig. 4. The weight 81 shown consists of a piece of pipe with closed ends containing iron or lead balls, and is provided with two eyes 81<sup>a</sup> for attaching the rope 80 at one end and a suspension hook 83 at the other end respectively.

A boom 85 is removably hinged to each corner of the rear end of the body 1. Each boom 85 is guyed by a rope 86, Fig. 1. An apron 87 is hinged at its upper end to the depending straps 88 bolted to the frame 15. This apron 87 is partly supported, and its angle of slope adjusted, by means of the rope 89 over blocks 90 and 91 attached by chains 92 and 93 to the upper ends of the booms 85 and to the lower corners of said apron 87 respectively.

The apparatus having been drawn by horses attached to the pole 23 and backed to the place of operation, the horses and said pole are removed therefrom. The booms 85 and apron 87 are shipped. The crank 32 is then operated, winding the ropes 25 onto the drum 28, and thereby raising the bars 11 in the sleeves 9, the wheels 12 rolling under and causing the frame 15 to swing upward on the hinges 16, until the wheel 12 engages the blocks 18. The pins 14 are then inserted in the holes 9<sup>a</sup> of the sleeves 9, supporting the bars 11. The platform 35 is then placed on the ground directly in line with and in front of the body 1, with the inclined track 37 connecting the rails 36 on said platform with the ends of the rails 8. The carriage 39 is now allowed to run down onto the platform 35, by allowing the ropes 70 to unwind from the drums 57. The braces 49 are then unhooked from the pieces 50 allowing the plate 41 to swing down and rest upon the platform 35. The motor 59 is started, and the slope or inclination of the apron 87 is adjusted by means of the tackle formed by the rope 89 and the blocks 90 and 91. A dump cart or wagon containing the material to be loaded is backed upon the platform 35 and plate 41 and then dumped upon the carriage 39. The lever 61 is now operated, coupling the shaft 62 to the shaft of the motor 59, the pinion 64 and gear 58 causing the shaft 55 to revolve and the ropes 70 to wind upon the drums 57. The weights 81, by the arrangement described, put sufficient pressure on the ropes 70 by the sheaves 75 to cause said ropes to coil evenly upon said drums, and not unevenly, or for example entirely at one end of a drum, as they otherwise would in leading onto the drums from the sheaves 71. The ropes 70 being thus wound upon the drums 57, cause the blocks 47 to first pull on the chains 46, thereby swinging up the plate 41 on its hinges from the horizontal to the inclined position, the braces 49 sliding on the pieces 50 until they are



hooked into same, whereupon the pull of the blocks 47 is divided between the chains 46 and 48 and the carriage 39 with its load is pulled up the runway, the wheels 42 rolling successively upon the rails 36, 37, 8 and 17. It will be noted that in its inclined hooked position the plate 41 forms an end board to the carriage 39 and prevents material from dropping off same while going up the incline of the runway.

When the carriage 39 arrives near the upper portion of the frame 15, the wheels 42 on the axles 43 run on the approximately level portions of the rails 17, while the wheels 45 on the axles 44 roll upon the short inclined rails 20, to cause the carriage 39 to tip so as to dump the load from same. The carriage continuing to be pulled by the ropes 70, the wheels 42 on the axles 43 soon engage the upwardly curved ends of the rails 17, and the wheels 44 engage the similarly curved ends of the rails 20, the carriage then being in the position shown by dotted lines in Fig. 1. At the instant that this position is reached the lever 61 is operated to stop winding the ropes 70, and the brake 66 is tightened by means of the lever 67. Should however the operator be slow in the accomplishment of these operations, the ropes 70 will tip the carriage 39 up farther, the wheels 45 pulling the rails 20 sliding in the guides 19 against the action of the spring 22. This arrangement provides a safety device and prevents the shock which would otherwise occur if the rails 20 were stationary. The material thus dumped from the carriage 39 falls upon the apron 87, from which it slides into a bin or onto a scow or otherwise as desired. By releasing the brake 66 the carriage is allowed to return by gravity to the position on the platform 35 for receiving the next load, and the operations as described are then repeated.

I claim:

1. In coal loading apparatus, the combination of a portable body, an inclined runway carried by said body and comprising a fixed lower section and a hinged upper section, and upright bars slidable in upward direction beneath the hinged section to elevate the same.

2. In coal loading apparatus, the combination of a portable body, a fixed runway section carried at the front of said body, a hinged runway section carried at the rear thereof, and upright bars located adjacent the rear corners of said body and slidable vertically to raise and lower the hinged runway section.

3. In coal loading apparatus, the combination of a portable body, a fixed runway section carried at the front of said body, a hinged runway section carried at the rear thereof, upright bars located adjacent to the rear corners of said body and slidable verti-

cally to raise and lower the hinged runway section, and upright sleeves in which said bars are housed.

4. In an apparatus for elevating and dumping coal and the like, an inclined runway having tracks which are deflected horizontally at the upper end of the runway, and a carriage having wheels adapted to run on said tracks, in combination with a supplemental upwardly extended track section of a wider gage at the upper end of the runway, and guides on the rear of the carriage adapted to engage the supplemental track section to dump the carriage as it is drawn up the runway, the rails of said supplemental track-section terminating in abutments and being mounted to yield in the direction of travel of the carriage to form a buffer.

5. In a portable elevating and dumping apparatus, an inclined runway comprising a lower main section and an upper extension section cooperating therewith, a carriage on which the runway is mounted, mechanism for raising and lowering the extension section and for securing it in its raised position, whereby the height of the apparatus may be conveniently decreased during transportation, a carriage cooperating with said runway, and mechanism at the upper end of the extension section for dumping the carriage.

6. In an elevating and dumping apparatus, an inclined runway comprising a lower main section and an upper extension section hinged thereto, in combination with mechanism for raising and lowering said supplemental section comprising telescoping standards, a rope 25 passing over sheaves 13 and 26 on said standards, a windlass on which the rope is wound to elevate the standards, and mechanism for retaining the parts in their elevated positions.

7. In an elevating and dumping apparatus, an inclined runway comprising a lower main section and an upper extension section hinged thereto, in combination with telescoping standards for raising and lowering the supplemental section, anti-friction rollers on the upper ends of said standards, and shoulders 18 engaged by the rollers when the parts are in elevated position.

8. A load carriage for inclined runways comprising a body portion, an end portion hinged thereto, said body portion and end portion having telescoping side walls, and means for folding up the end portion to act as a tail gate, whereby the carriage may be laid flat for filling and when the end is folded up will retain the load on the inclined runway.

9. A load carriage for inclined runways comprising a body portion having side walls 40, an end portion having side walls 41 hinged to the body portion and chains 46 and 48 connected to the body portion and



end portion respectively, whereby the end portion is turned up to form an end gate when the carriage is drawn up the runway.

10. A load carriage for inclined runways 5 comprising a body portion made of sheet metal with upturned side walls 40, an end portion made of sheet metal with upturned side walls 41 hinged to the body portion, and, chains 48 and 46 attached to the body 10 portion and end portion respectively, and the hinged brace 49 for limiting the turning movement of the end portion.

11. In a hoisting apparatus, a flanged hoisting drum, a hoisting rope attached to 15 the drum in proximity to one flange thereof, and a guiding device yieldingly pressed against the rope with constant pressure in one direction to urge it toward the other end of the drum, whereby the rope is evenly 20 wound on the drum.

12. In a hoisting apparatus, a flanged hoisting drum, a hoisting rope attached to the drum in proximity to one flange thereof, and a guiding device comprising a sheave 25 engaging the rope, a lever arm on which the sheave is mounted, and tension mechanism tending to press the sheave against the rope to urge it toward the other end of the drum.

13. In a hoisting apparatus, a hoisting drum 57, a hoisting rope attached to the drum near one end thereof, and a guiding device comprising a sheave 75 carrying a stirrup 76, a lever arm 77 on which the 30 sheave is mounted, and a weight 81 connected to the other arm of the lever, whereby the sheave is yieldingly pressed against the rope to urge it toward the other end of the drum.

14. In a portable hoisting and dumping 40 apparatus, an inclined runway, a carriage on which the runway is mounted, a level ground track section, and an inclined connecting track section for coupling the ground track 45 section with the runway, in combination with a carriage for the runway comprising

a main body portion and an end portion pivoted thereto, whereby when the carriage is at rest on the level track section the end portion of the carriage may be dropped to a 50 level position for filling, and when the carriage is drawn up the inclined runway the end portion can be lifted to constitute a tail gate.

15. In a portable hoisting and dumping 55 apparatus, an inclined runway, a carriage on which the runway is mounted, a level ground track section, and an inclined connecting track section for coupling the ground track section with the runway, in 60 combination with the carriage for the runway comprising a main body portion and an end portion pivoted thereto, whereby when the carriage is at rest on the level track section the end portion of the carriage may be 65 dropped to a level position for filling, and when the carriage is drawn up the inclined runway the end portion can be lifted to constitute a tail gate, and mechanism at the upper end of the runway for elevating the rear 70 end of the carriage to dump it.

16. In coal loading apparatus, in combination, a hinged runway section, upright bars slidable vertically beneath said section to raise and lower the same, a drum or wind- 75 lass, and connections between said drum and said bars by which the latter may be raised and lowered.

17. In coal loading apparatus, the combination of a portable body, an inclined run- 80 way section fixed at one end of the body, an inclined runway section in hinged relation to the fixed section and overhanging the opposite end of the body, upright bars having their upper ends in sliding relation with the 85 under surface of the hinged section, and means for raising and lowering said bars.

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