

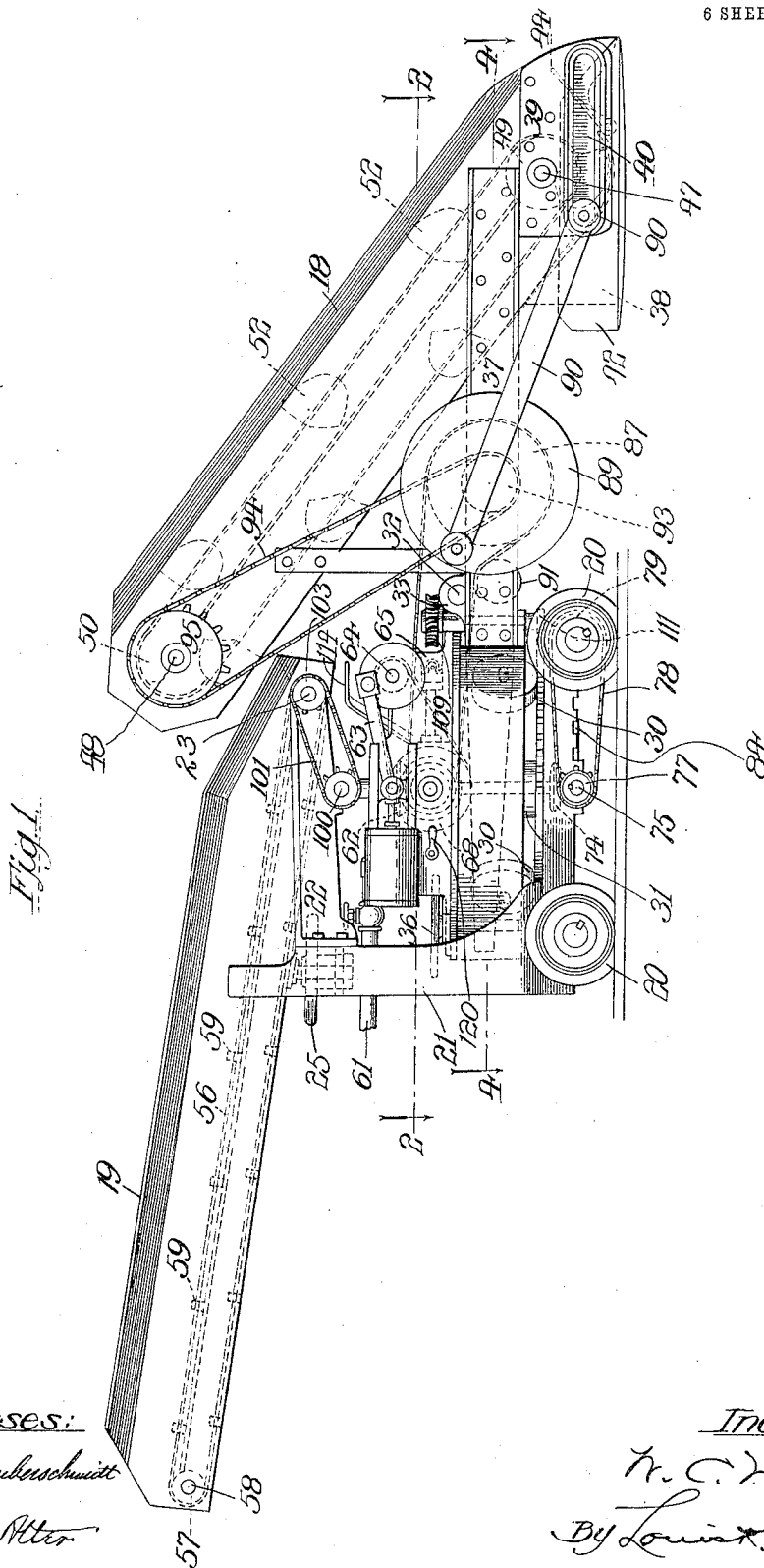
No. 801,948.

PATENTED OCT. 17, 1905.

W. C. WHITCOMB.
COAL OR ORE LOADER.

APPLICATION FILED APR. 20, 1904.

6 SHEETS—SHEET 1.



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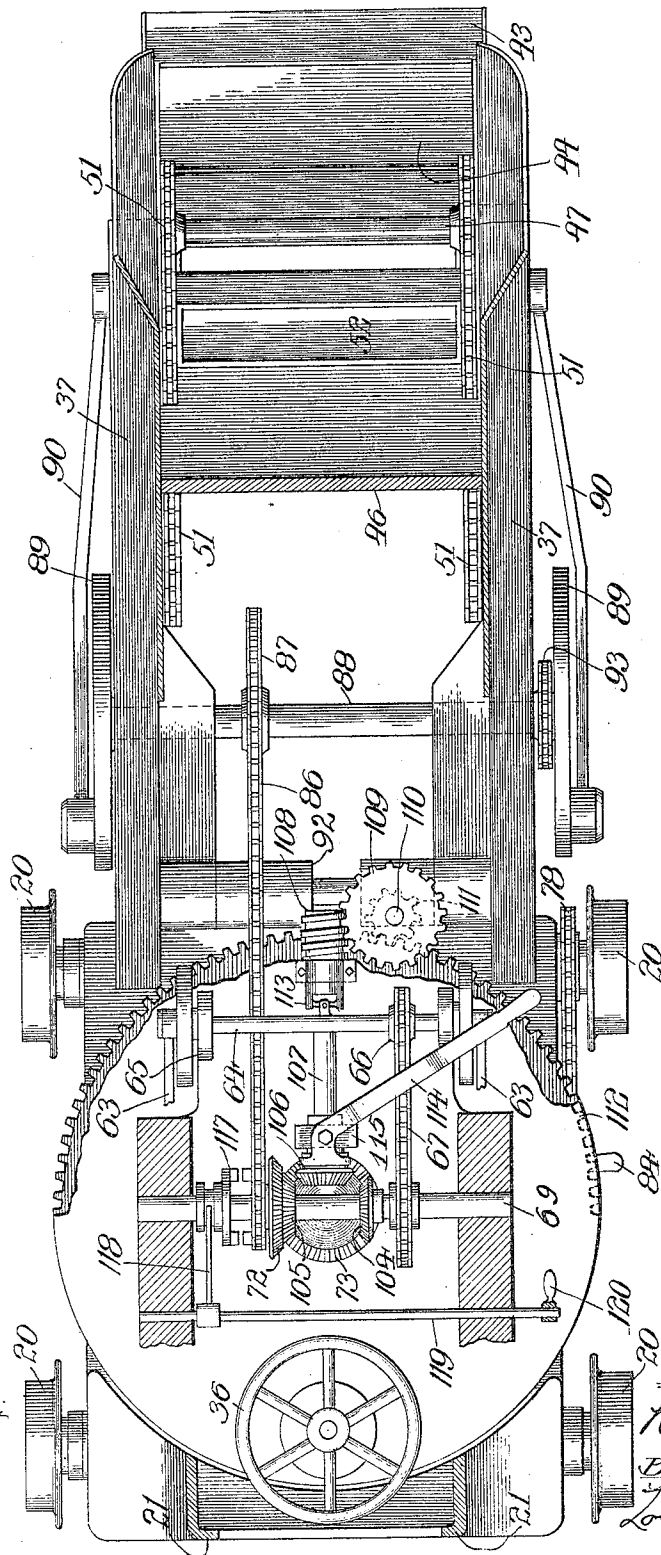
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6 SHEETS—SHEET 2.

Fig. 2



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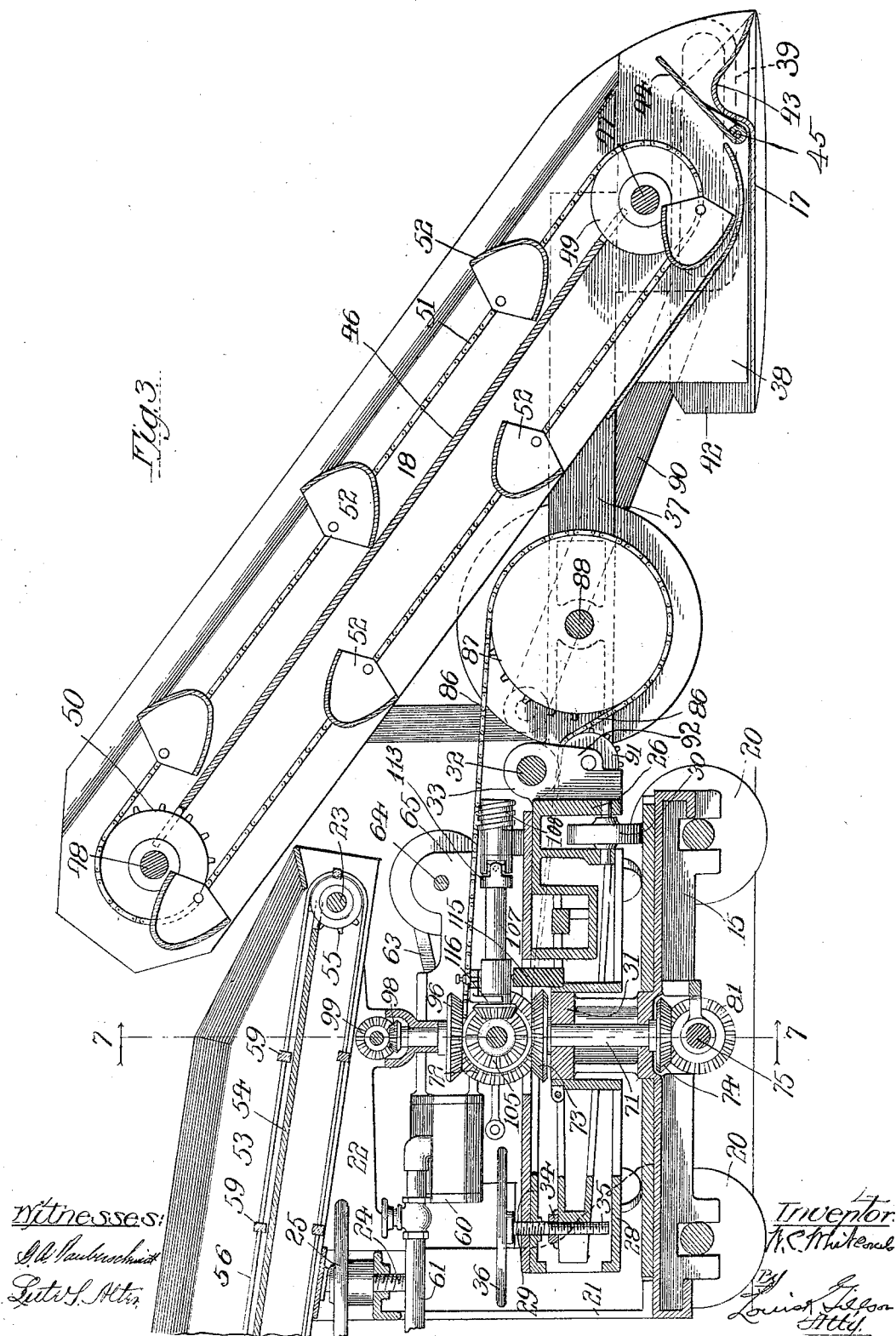
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6 SHEETS—SHEET 3.



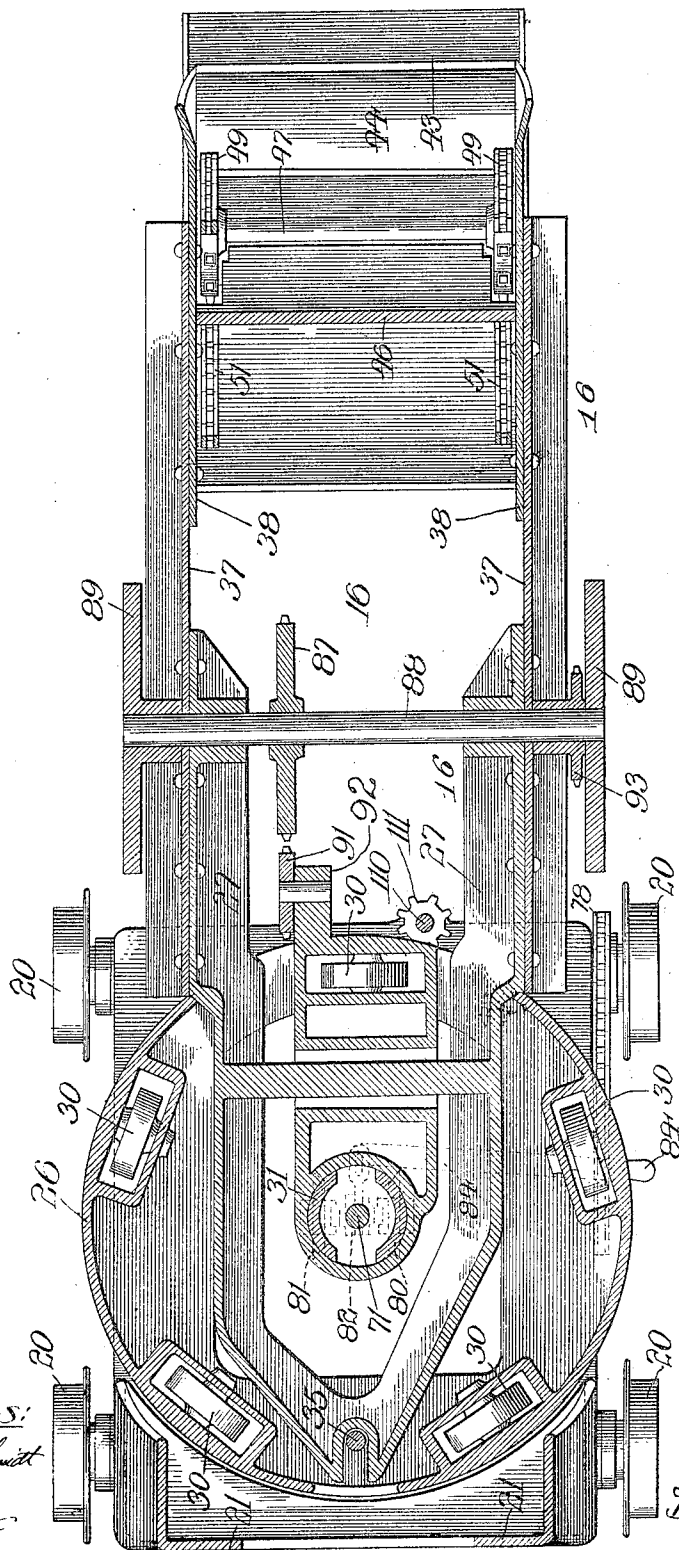
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6 SHEETS—SHEET 4.

Fig. 4.



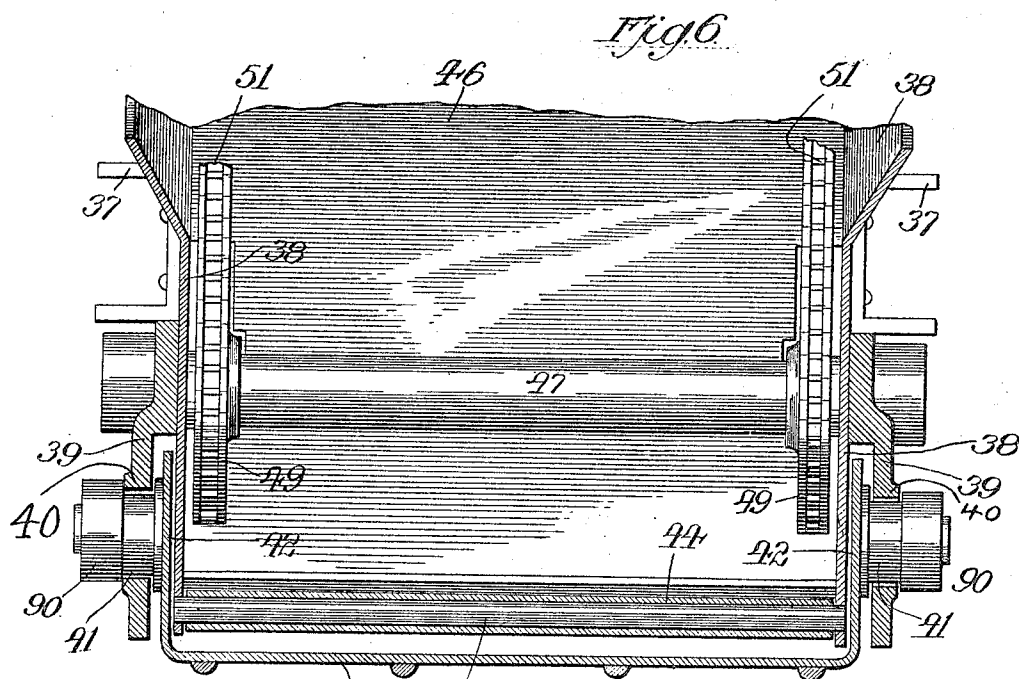
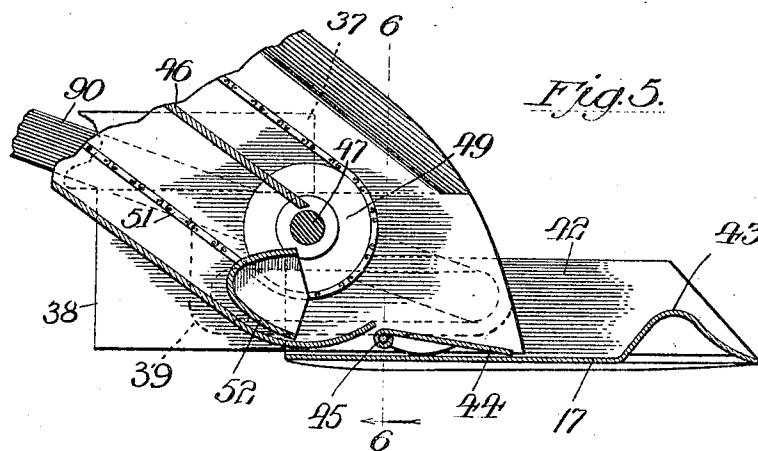
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6 SHEETS—SHEET 5.



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6 SHEETS—SHEET 6.

Fig. 7

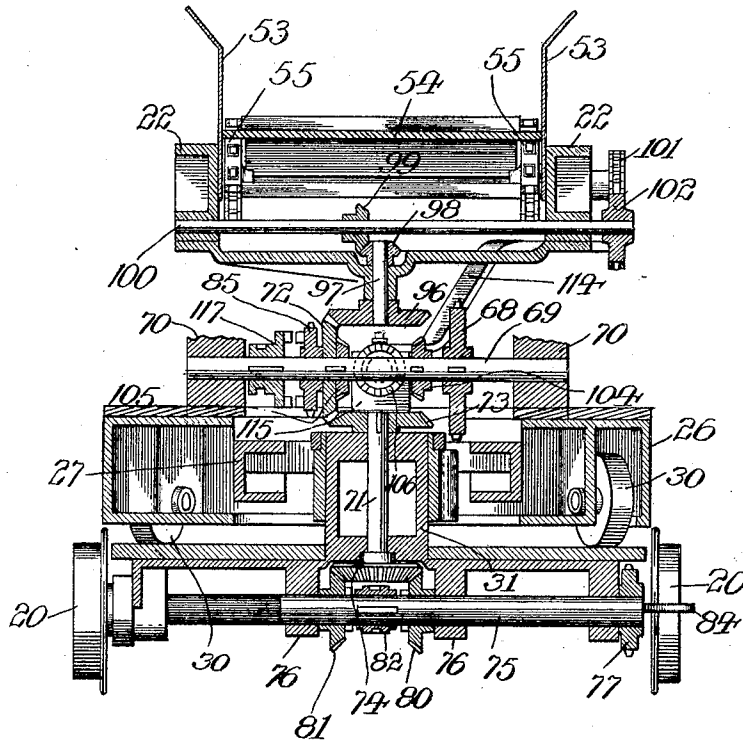
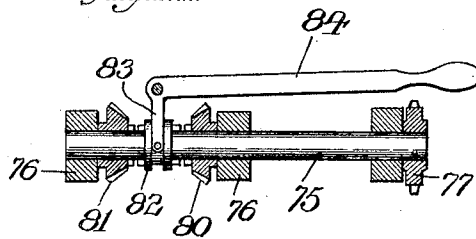


Fig. 8



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UNITED STATES PATENT OFFICE.

WILLIAM C. WHITCOMB, OF CHICAGO, ILLINOIS.

COAL OR ORE LOADER.

No. 801,948.

Specification of Letters Patent.

Patented Oct. 17, 1905.

Application filed April 20, 1904. Serial No. 203,991.

To all whom it may concern:

Be it known that I, WILLIAM C. WHITCOMB, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Coal or Ore Loaders, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to a machine for loading material such as coal or ore and adapted particularly to raise the material from the ground and deposit it in a car, the objects of the invention being to provide for a shoveling action and for the delivery of the material from the shovel to the buckets of an elevator, to provide for a wide range of action of the machine, and a high degree of efficiency. These objects are attained in the mechanism hereinafter described and which is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a plan section of the same on the line 2 2 of Fig. 1. Fig. 3 is a central longitudinal vertical section. Fig. 4 is a plan section on the line 4 4 of Fig. 1. Fig. 5 is a detail central section showing the parts in different position than as in Fig. 3. Fig. 6 is a transverse detail section on the line 6 6 of Fig. 5. Fig. 7 is a transverse vertical section on the line 7 7 of Fig. 3, and Fig. 8 is a detail of the clutch mechanism used on the machine.

The machine comprises a wheeled truck 15, a crane (generally designated 16) swinging horizontally on the truck; a reciprocating shovel 17, carried by the jib of the crane; an elevator 18, to which the shovel delivers; a conveyor 19, receiving from the elevator and delivering to a suitable receptacle, (not shown,) and suitable motors and gearing mounted upon the crane for advancing the truck, swinging the crane, and actuating the shovel, elevator, and conveyor.

The truck 15 is shown as mounted on wheels 20, adapted to run on a track. From the rear end of the platform of the truck there rises a standard 21, from each side of which projects forwardly an arm 22. Between the forward ends of the arms 22 the conveyor 19 is pivoted at 23. A screw-rod 24, running in a threaded aperture in the upright 21, supports the rearward end of the conveyor and is controlled by means of a hand-wheel 25, so as to provide for its vertical adjustment.

The crane 16 comprises a turn-table 26 and

a jib-frame 27, carried thereby. The turn-table 26 is a hollow casting comprising a lower plate 28 and an upper plate 29, united by suitable webbing, this webbing being in part so disposed as to form housings for wheels 30 for carrying the turn-table and which run upon the truck-platform. The turn-table is centrally apertured to receive a pedestal 31, rising from the truck-platform and serving to maintain the table in its proper position.

The jib-frame 27 (shown most clearly in Fig. 4) comprises a casting, roughly speaking, U-shaped, the forward end of which is pivoted at 32 to suitable lugs 33, formed on the turn-table, and the rearward end of which projects across and through the turn-table and bears upwardly against a nut 34, carried by a threaded rod 35, turning in an aperture in the upper plate 29 of the turn-table and provided with a hand-wheel 36, by which it may be controlled.

Side bars 37, shown in the form of channel-bars, are bolted to the arms of the rearward section 27 of the jib and project forwardly therefrom and constitute the forward section of the jib. To the forward ends of the bars 37 are bolted the sides 38 of the trough of the elevator 18, and to the outer face of the lower end of each of these trough sides there is fixed a bracket 39, which projects downwardly and forwardly and is offset outwardly. Each of these brackets is provided with a horizontal aperture 40, through which there project the trunnions of the shovel 17.

The shovel is provided with a flat bottom which is adapted to slide upon the ground and upturned sides 42, to which the trunnions 41 are secured. The forward end of the bottom of the shovel bows upwardly, as shown at 43, its extreme front edge being brought to the same plane as the main portion of the bottom.

An oscillating apron 44 is pivoted upon a rod 45, extending across the bottom of the trough of the elevator 18 and fixed in the side plates 38 thereof. When the shovel 17 is in its advanced position, as shown in Fig. 5, the apron 44 rests loosely upon its bottom plate. As the shovel 17 is drawn backwardly with its load the latter is carried over the apron 44, and as the front edge thereof comes in contact with the bowed portion 43 of the shovel the apron is raised by a cam action to the position shown in Fig. 3, thus forming a wall for retaining the material, so that it may be more readily picked up by the buckets of the elevator.

The elevator comprises the trough having the side walls 38, already mentioned, and a bottom plate 46, extending transversely between the same. A pair of shafts 47 48 are journaled in the side walls 38 of the trough of the elevator, one at the lower end and the other at the upper end of such trough, and these shafts carry sprocket-wheels 49 50, upon which run a pair of chains 51, to which are attached elevator-buckets 52, which enter the chamber of the shovel 17, where they are filled, and which discharge at the upper end of the elevator into the conveyer 19. This conveyer comprises a trough having side walls 53 and a bottom plate 54, extending therebetween. The shaft 23, which, as already described, forms the pivotal support for the forward end of the conveyer, carries a pair of sprocket-wheels 55, upon which run a pair of sprocket-chains 56, which turn over similar sprocket-wheels 57 upon a shaft 58, journaled in the farther ends of the sides 53 of the conveyer-trough. To the chains 56 there are attached conveying-slats 59, which sweep the floor 54, so that as material is discharged upon the forward end of the floor of the conveyer from the elevator 18 it is carried backwardly by these slats.

The machine is operated by any suitable motor—as shown by means of a pair of steam or air engines carried by the turn-table 26. These motors each comprise a cylinder 60, served with fluid under pressure through a suitable pipe 61 and actuating through the medium of their pistons, (not shown,) their piston-rods 62, and connecting-rods 63 a crank-shaft 64, journaled in suitable brackets 65, rising from the turn-table 26. From the crank-shaft 64 power is transmitted through a sprocket-wheel 66, fixed upon this shaft, and a chain 67, running thereon and upon a sprocket-wheel 68, fixed upon a counter-shaft 69, journaled in suitable bearing-blocks 70, rising from the turn-table 26, the shaft 69 crossing the turn-table diametrically. A vertical shaft 71 is journaled in the pedestal 31 and upon the axis thereof. This shaft is driven by means of a beveled gear 72 on the counter-shaft 69, intermeshing with a beveled gear 73, fixed on the upper end of the shaft 71, which shaft also carries at its lower end a beveled gear 74. A counter-shaft 75 is journaled in suitable brackets 76 76, depending from the floor of the truck 15. A sprocket-wheel 77 is keyed upon the shaft 75 and carries a sprocket-chain 78, turning over a sprocket-wheel 79, keyed upon one of the axles of the truck. A pair of beveled gears 80 and 81 are loose upon the counter-shaft 75 and intermesh with the gear 74 and are controlled by means of a clutch 82, splined upon the shaft 75 and reciprocating into engagement alternately with the gears 80 and 81 for the purpose of driving the truck in either

direction upon its track. The sleeve 82 is annularly grooved for the engagement of a yoke 83, controlled by a shipper-lever 84, suitably pivoted to the frame of the truck and rigidly attached to the yoke 83. The length of the sleeve is such that it may be thrown to a central position, so as to be disengaged from both of the gears 80 and 81. From a sprocket-wheel 85, mounted on the counter-shaft 69, there leads forwardly a sprocket-chain 86, turning over a sprocket-wheel 87, fixed upon a counter-shaft 88, journaled in suitable bearings formed in the side arms of the crane-jib 16. A pair of crank-disks 89 89 is mounted one upon each end of the shaft 88, and from each of these disks leads a pitman 90 90, in engagement with the trunnions 41 of the shovel 17, whereby a reciprocatory movement is imparted to the shovel. The sprocket-chain 86 is led over an idler-sprocket 91, journaled in ears 92, projecting forwardly from the turn-table 26 and serving to guide the chain. From a sprocket-wheel 93, fixed on the shaft 88, there leads a sprocket-chain 94 to a sprocket-wheel 95, fixed on the upper shaft 48 of the elevator 18. The gear 72, already referred to as mounted upon the counter-shaft 69, intermeshes with a beveled gear 96, fixed upon a vertical shaft 97, journaled in a suitable bearing in the base-plate of the conveyer 19, and carrying at its upper end a beveled gear 98 intermeshing with a similar gear 99, keyed upon a counter-shaft 100, journaled transversely across the conveyer, and a sprocket-chain 101 leads from a sprocket-wheel 102, fixed upon this counter-shaft, to a sprocket-wheel 103, fixed upon the shaft 23 of the conveyer. Two oppositely-facing beveled gears 104 105 are keyed upon the counter-shaft 69 and are engaged in alternation by a beveled gear 106, fixed upon a worm-shaft 107, the worm 108 of which engages a worm-wheel 109, fixed upon a vertical shaft 110, journaled in suitable boxes formed on the turn-table 26 and carrying at its lower end a pinion 111, intermeshing with an annular rack 112, fixed upon the table of the truck 15. The worm-shaft 107 is provided with a universal joint 113, so that its end carrying the beveled gear 106 may be vibrated to bring this gear into engagement with either of the gears 104 105 or dispose it in a central position out of engagement with either of them. This vibratory movement is secured by means of a hand-lever 114, pivoted upon a bracket 115, rising from the turn-table 26, and carrying a yoke 116, engaging the shaft 107. The sprocket-wheel 85 is loose on the shaft 69 and is controlled by means of a clutch 117, turning with the shaft and shown as being controlled by means of a shipper-arm 118, fixed upon a slide-rod 119, carried by the frame of the turn-table 26, and having a handle 120.

The operation of the machine is as follows: Fluid-pressure or other power is led to it from a suitable source of supply through a

suitable connection, as the pipe 61. The motor or motors, as the engine 60, are controlled by suitable and ordinary means, and being set in motion the machine may be driven at the will of the operator whose control is exercised by means of the hand-lever 84. The machine having been brought into proper position for service, the lever 84 is thrown to its central position, disengaging the driving mechanism. By means of the rod 119 the clutch 117 is now thrown to engage the gear 85 with the counter-shaft 69, thus setting in motion the shovel 17 and the elevator 18. It will be seen that as the upper end of the elevator is substantially over the center about which the crane swings delivery will be made upon the forward end of the conveyer to whatever position the shovel may be swung. The shovel is moved laterally as the exigencies of the service may be required, this movement being controlled by means of the hand-lever 114, bringing the gear 106 into engagement with either the gear 104 or 105, thereby causing the rotation of the shaft 110. As shown, the conveyer-belt is constantly driven. If desired, suitable clutch mechanism may be provided for throwing it out of action. The machine as organized is adapted especially for the delivery of material to a car running upon the same track, and hence no provision is made for swinging the conveyer laterally. In order to adapt it for delivery to cars of various heights, its delivery end may be raised and lowered through the medium of the screw 24, controlled by the hand-wheel 25. The shovel preferably slides upon the floor, upon which the material to be raised is deposited, and in order to bring it to the level of the floor, which may vary relatively as to that of the track upon which the machine stands, the rearward end of the crane-jib is raised and lowered by means of the hand-wheel 36.

I claim as my invention—

1. In an ore and coal loading machine, in combination, a shovel, an elevator, the receiving end of which is located in the chamber of the shovel, and means for reciprocating the shovel in line with the elevator.

2. In an ore and coal loading machine, in combination, a reciprocatory shovel, an oscillatory apron within the chamber of the shovel, means for oscillating the apron, and an elevator, the receiving end of which is located in the chamber of the shovel back of the apron.

3. In an ore and coal loading machine, in combination, a reciprocatory shovel having its bottom upwardly bowed across its forward end, an oscillatory apron mounted independently of the shovel but within the chamber thereof, the free end of the apron lying in the path of the bowed portion of the shovel-bottom; and an elevator, the receiving end of which is located in the chamber of the shovel back of the apron.

4. In an ore and coal loading machine, in

combination, a reciprocatory shovel; a movable abutment; means for throwing such abutment across the front end of the shovel; and an elevator having its receiving end located within the chamber of the shovel.

5. In an ore and coal loading machine, in combination, a crane having a swinging jib, a reciprocatory shovel, and an elevator carried by the jib, the receiving end of the elevator entering the chamber of the shovel.

6. In an ore and coal loading machine, in combination, a crane having a swinging jib, a reciprocatory shovel carried by the jib; an abutment movable into and out of the receiving end of the shovel-chamber; and an elevator carried by the crane-jib and having its receiving end located in the chamber of the shovel.

7. In an ore and coal loading machine, in combination, a crane having a swinging jib; a reciprocatory shovel carried by the crane-jib; an oscillatory apron mounted within the chamber of the shovel; and an elevator carried by the jib and entering the chamber of the shovel back of the apron.

8. In an ore and coal loading machine, in combination, a crane having a swinging jib; a reciprocatory shovel carried by the crane-jib and having its bottom bowed upwardly; an oscillatory apron mounted within the chamber of the shovel; and an elevator carried by the jib and entering the chamber of the shovel back of the apron.

9. In an ore and coal loading machine, in combination, a crane having a swinging jib; a reciprocatory shovel carried by the crane-jib and having its bottom bowed upwardly; an oscillatory apron mounted within the chamber of the shovel and having its free end in the path of the bowed portion of the shovel-bottom; and an elevator carried by the jib and entering the chamber of the shovel back of the apron.

10. In an ore and coal loading machine, in combination, a movable truck; a reciprocatory shovel carried by the truck and arranged to swing horizontally; an elevator mounted with and receiving material from the shovel; a conveyer carried by the truck and receiving the discharge of the elevator; a motor carried by the truck; and operative connection between the motor and the shovel, the elevator and the conveyer.

11. In an ore and coal loading machine, in combination, a movable truck; a reciprocatory shovel carried by the truck and arranged to swing horizontally; an elevator mounted with and receiving material from the shovel; a conveyer carried by the truck and receiving the discharge of the elevator; a motor carried by the truck; an operative connection between the motor, the shovel, the elevator and the conveyer and the running-gear of the truck.

12. In an ore and coal loading machine, in combination, a truck; a turn-table mounted upon the truck; a motor carried by the turn-

table; a counter-shaft journaled diametrically across the turn-table; a crane-jib carried by the turn-table; a reciprocatory shovel carried by the crane-jib; an elevator carried by the crane-jib and having its receiving end in co-
 5 operation with the shovel; means actuated from the counter-shaft for turning the turn-table; and means actuated from the counter-shaft for actuating the shovel and elevator.

10 13. In an ore and coal loading machine, in combination, a truck; a turn-table mounted upon the truck; a motor carried by the turn-table; a counter-shaft journaled diametrically across the turn-table; a crane-jib carried by
 15 the turn-table; a reciprocatory shovel carried by the crane-jib; an elevator carried by the crane-jib and having its receiving end in co-operation with the shovel; means actuated from the counter-shaft for turning the turn-
 20 table; means actuated from the counter-shaft for actuating the shovel and elevator; and means for tilting the crane-jib.

14. In an ore and coal loading machine, in combination, a truck; a pedestal rising from
 25 the table of the truck; a turn-table swiveled upon the pedestal and running upon the table of the truck; a crane-jib pivotally carried by the turn-table; a screw-rod for tilting the crane-jib; a shovel carried by the crane-jib;
 30 an elevator carried by the crane-jib and leading from the shovel; a motor mounted upon the turn-table; and connections leading from the motor for turning the turn-table and actuating the shovel and the elevator.

35 15. In an ore and coal loading machine, in combination, a truck, a turn-table rotatably mounted on the truck; a crane-jib carried by the turn-table; a shovel carried by the crane-

jib; an elevator carried on the crane-jib and over the shovel; a motor; a connection lead-
 40 ing from the motor for rotating the turn-table to actuate the shovel and elevator.

16. A low loading-machine comprising a traveling car, a base swiveled thereon, a
 45 shoveling conveyer supported on said swiveling base and having an elevating conveying mechanism and a wedge-like feeder at its front end, means on said car for thrusting said
 50 wedge-like feeder under the mass of material to be loaded, and means for operating said conveying mechanism.

17. A low loading-machine comprising a traveling car, a base swiveled thereon, a
 55 shoveling conveyer supported on said swiveling base and having an elevating conveying mechanism and a wedge-like feeder at its front end, means on said car for thrusting said
 60 wedge-like feeder under the mass of material to be loaded, means for operating said conveying mechanism, and a supplemental elevating conveying mechanism operative in con-
 65 junction with said swiveling conveyer.

18. A low loading-machine comprising a traveling car, a base swiveled thereon, a
 65 shoveling conveyer supported on said swiveling base and having an elevating conveying mechanism and a wedge-like feeder at its front end, a supplemental conveying mechanism
 70 supported on said car outside of said base and operative in conjunction with said swiveling conveyer, and means for operating said conveying mechanisms.

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