No. 733,418. PATENTED JULY 14, 1906.

T. M. PARK.

AUTOMATIC LOADING DEVICE.

APPLICATION FILED JAN. 20, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

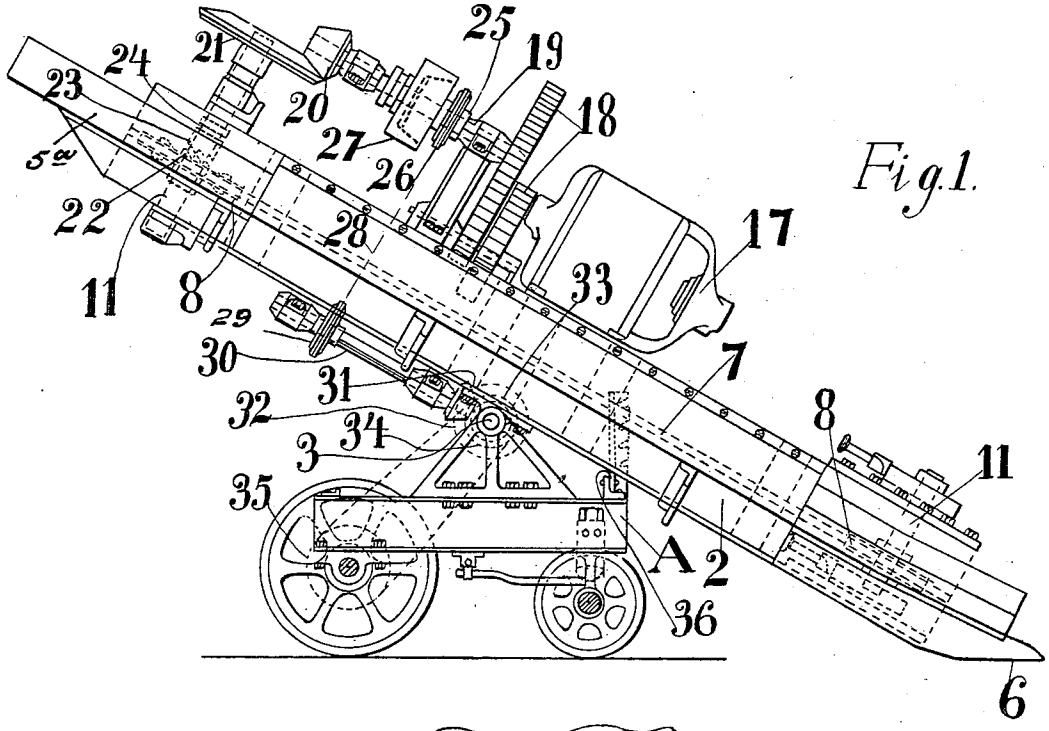
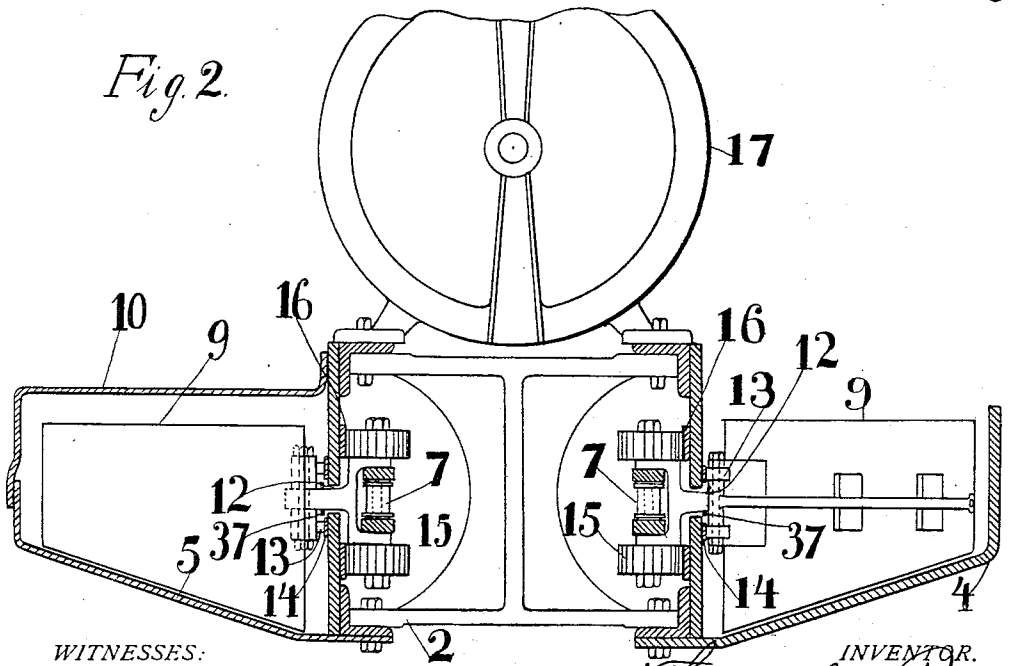


Fig. 2.



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T. M. PARK.

AUTOMATIC LOADING DEVICE.

APPLICATION FILED JAN. 20, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

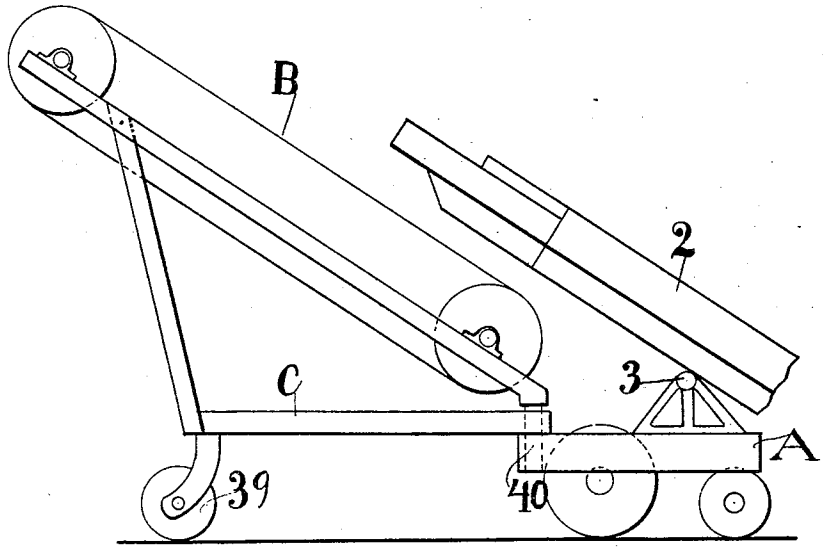


Fig. 4.

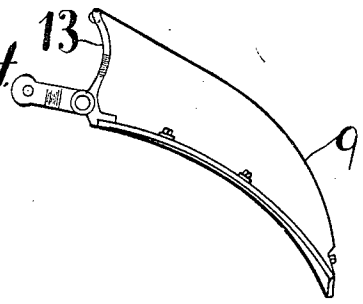
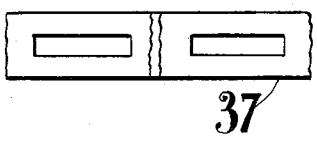


Fig. 5.



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No. 733,418. Patented July 14, 1903.

UNITED STATES PATENT OFFICE.

THOMAS M. PARK, OF DARRINGTON, WASHINGTON.

AUTOMATIC LOADING DEVICE.

SPECIFICATION forming part of Letters Patent No. 733,418, dated July 14, 1903.

Application filed January 20, 1903. Serial No. 139,741. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. PARK, a citizen of the United States, residing at Darrington, county of Snohomish, State of Washington, have invented an Improvement in Automatic Loading Devices; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in machines for loading ore, coal, gravel, and other material upon cars or wagons. Its object is to provide a compact loading apparatus particularly designed for mining and excavating operations which will do the work heretofore generally done by hand and which may be easily moved from place to place.

It consists of the parts and the construction and combination of parts hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is an elevation of my apparatus. Fig. 2 is a cross-section centrally through the conveyer-frame, showing connections of conveyer chains and blades. Fig. 3 shows an attachment to my loader. Fig. 4 is a detail of a conveyer-blade. Fig. 5 is a fragment of the flexible band for covering the slots in the frame sides.

A represents a wheeled carriage or truck of suitable design adapted to run upon the ground or to be supported on rails, according as the exigency of any particular case may demand.

2 is a frame having a tilting movement about a centrally-disposed fulcrum-shaft 3 on frame A. This frame may be of any suitable size and is preferably constructed of metal plates and angles bolted together and properly braced by cross-plates and lattice-bars to form a rigid structure. Suitably secured to the sides of the frame are two troughs 4 5, having their bottoms inclined upwardly toward their outer edges in conformity with the inclined apron 6 on the front end of the frame. An endless conveyer comprising a chain 7, traveling about sprockets 8, disposed at the ends of frame 2 and having outwardly-extending blades 9, is adapted to operate in these troughs to sweep up a load from the apron when the frame is tilted, as shown in Fig. 1, and carry it upward to the rear elevated end of the frame, whence it is discharged into cars or wagons. Accordingly trough 4, through which the material is conveyed, is of heavy plate-steel, while trough 5, down through which the empty blades return, may be of lighter sheet metal. Trough 5 is preferably sheathed over, as shown, and provided with a side extension 5^a at its rear end to guard against anything being accidentally caught in the traveling arms. Trough 4 is preferably open to prevent choking, as where large rocks are handled.

The apron 6 is secured to the front end of frame 2 and has its bottom so inclined in relation to the frame that when the latter is tilted into working position, as in Fig. 1, it will be approximately parallel to and in close proximity to the surface of the excavation in which the machine is located, so that as the machine is advanced to scoop up the ore mined or the earth or other material to be removed or however this ore or material may be delivered upon or immediately adjacent to the apron the blades will in their revolution sweep up successive loads into trough 4. The sides of the apron gradually curve upward to meet the slanting bottoms of the conveyer-troughs. The bottom edges of the blades are inclined correspondingly with the surface of the apron and with the slant of the troughs, as shown. The frame is so balanced on shaft 3 that the front end will normally rest on the ground. The conveyer-sprockets 8 are mounted on shafts 11, disposed at right angles to the plane of the frame. The chain travels between the walls of the frame, and the blades are pivotally connected with the chain through the longitudinal slots 12 in the frame-walls. In consequence the chain is protected from the material passing up through trough 4 by means of the intervening frame-wall. This matter of protecting the chain has proven of great importance in handling certain classes of ore.

The blades or buckets each comprise a web or bracket pivotally connected with the chain and having a backwardly-extending bifurcated heel 13, straddling slot 12 and bearing upon wearing-plates 14, secured to the outer surface of the frame-walls. The curved shear or scoop portions are removably attached to the brackets, whereby they may be quickly replaced when worn out. If desired,

the heel 13 may be provided with roller-bearings, by which the friction would be considerably reduced. A continuous flexible steel band 37 fits over the outside of the slots in the frame and is slotted to admit the lugs upon which the blades are fastened. This band travels with the chain, completely covers the slots in the frame, and protects the chain perfectly from the material conveyed by the arms. The pivots of the chain are supplied with rollers 15, which bear upon wearing-plates 16, secured to the inner side of the frame-walls on either side of slots 12.

Any suitable means may be employed to operate the conveyer. In the present instance I have shown a motor 17 mounted on the frame and receiving energy from any suitable source. The motor-shaft is connected by suitable reducing-gears 18 with a shaft 19, having a beveled gear 20, meshing with a beveled gear 21 on the rear conveyer sprocket-shaft 11. The sprocket on this shaft is fixed to a sleeve 22, which is loosely turnable on the shaft. Sleeve 22 forms one member of a clutch, the other member of which consists of a sleeve 23, slidable in a feather on and turnable with the shaft and operated by a suitable forked lever (not shown) intended to engage in groove 24. The clutch members are for the purpose of disconnecting the conveyer and motor when the machine is to be moved from one spot to another, during which time it is not desired that the conveyer should operate.

It is necessary in mining or excavating to change continually the position or location of the machine. The same motive power used to drive the conveyer may be utilized for purposes of propulsion.

The shaft 19 carries a loose sleeve 25, to which is fixed a sprocket 26. By means of a friction cone-clutch 27 on shaft 19 and suitable shifting mechanism the sleeve 25 may be engaged to revolve sprocket 26 and transmit power through a chain 28 to a sprocket 29 on shaft 30, journaled on the under side of frame 2 and carrying a beveled gear 31, engaging a gear 32, concentric with the fulcrum-shaft 3. Gear 32 carries a sprocket 33, around which passes a chain 34, leading over a second sprocket 35 on the rear truck-axle. As the distances between sprockets 26 and 29 and between sprockets 33 and 35 remain constant, the tension on chains 28 and 34 will not be varied as the frame is tilted. In the operation of moving the apparatus clutch 23 is shifted to throw out the conveyer and the frame is tilted on the fulcrum-shaft into a horizontal position and there held by suitable means—as, for instance, a cross-bar—inserted in notches in the standard 36 beneath the frame. By throwing in clutch 27 power is transmitted direct from the motor to the truck-axle to move the apparatus as desired.

An attachment to the loader may be added in the nature of a supplemental conveyer, as where it is desired to load into cars or wagons standing parallel with the loader or where it is desired to employ the loader in excavating and it is necessary to lift the material to a height which could not be done by the loader itself without making it of an unwieldly length and without requiring such an amount of power to operate it as would render the machine impracticable. This attachment consists of an inclined conveyer B, preferably of the apron or belt type, supported upon a suitable frame C and driven from a motor located upon the frame. The rear end of frame is mounted upon swiveled caster-wheels 39, while its front end is pivoted to the loader-truck at 40. The material from the loader may thus be discharged at any point to right, left, or rear of the loader within the radius of the conveyer B.

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

1. The combination in a loading apparatus, of a tiltable frame mounted on wheels, troughs secured to the sides of said frame, and an endless chain conveyer having blades projecting through slots in the sides of said frame and coöperating with said troughs, said frame sides serving to protect the chain from the material conveyed.

2. The combination in a loading apparatus, of a tiltable frame, sprocket-wheels at the ends of the frame turnable on axes substantially perpendicular thereto, an endless link belt passing around said sprockets, conveyer-troughs at the sides of the frame, blades pivoted to said belt, and extending outwardly into the troughs and coöperating therewith, the inner walls of said troughs intervening to protect the belt from the material conveyed by said blades.

3. The combination in a loading apparatus, of a tiltable frame, a conveyer-trough along the side of the frame, an endless chain traveling about sprockets mounted at the ends of the frame on axes perpendicular thereto, conveyer-blades pivoted to said chain and coöperating with said trough, and means for protecting said chain from the material conveyed by said blades.

4. In a loading apparatus, the combination of a longitudinally-slotted frame, an endless chain incased within said frame, and traveling about sprockets mounted on axes perpendicular to the frame, a conveyer-trough secured to the side of said frame, and blades pivotally connected with said chain and projecting through the slots in the frame into said trough.

5. In a loading apparatus, the combination with a frame, a conveyer-trough secured to the side thereof, sprockets mounted at the ends of the frame on axes perpendicular thereto, a chain passing about said sprockets and incased in said frame, blades pivotally connected with the chain and projecting through slots in the walls of the frame into

the trough to coöperate with the latter to convey a load, and a bifurcated heel portion to said blades straddling said slots and supporting the blades at approximately right angles to the planes of the chain.

6. In a loading apparatus, the combination with a tiltable frame, of troughs secured to the sides of said frame, an endless traveling chain having its planes movable parallel with and equidistant from said frame and incased therein, blades pivotally connected with the chain and projecting through slots in the frame-walls into the troughs, and rollers carried by the chain bearing upon the inner surface of the frame-walls.

7. In a loading apparatus, the combination with a tiltable frame, of troughs having outwardly and upwardly inclined bottoms secured to the sides of the frame, and an endless conveyer having outwardly-extending blades movable in said troughs, and means upon the frame for operating the conveyer.

8. The combination in a loading apparatus, of a wheeled truck, a tiltable frame mounted thereon, sprockets mounted at the ends of said frame on shafts perpendicular thereto, an endless conveyer traveling about said sprockets, troughs carried by said frame through which the conveyer operates, a motor upon the frame, severable connections between the motor and one of said sprocket-shafts, and severable connections between the motor and a truck-axle, whereby the same motive power that is used to operate the conveyer may be employed to propel the apparatus.

9. The combination in a loading apparatus of a wheeled truck, a conveyer-frame centrally fulcrumed thereon and tiltable in a vertical plane, an endless conveyer traveling about sprockets mounted on shafts disposed perpendicular to the frame, a motor upon the latter, connections between the motor and one of said shafts to operate the conveyer, said connections including a shaft carrying a loose sprocket, means including clutch members one fixed to the shaft and the other fixed to the loose sprocket and shifting mechanism for causing said sprocket to turn with the shaft, and means including a second shaft and connections between said sprocket and a truck-axle to propel the apparatus.

10. In a loading apparatus, the combination of a wheeled truck, a tiltable conveyer-frame fulcrumed thereon, sprocket-wheels disposed at the ends of the frame and having axes perpendicular thereto, one of said sprockets loosely turnable on its axle, clutch mechanism by which said sprocket and its axle may be locked to turn in unison, a motor on the frame, and connections including a shaft 19 between the motor and said sprocket-axle, a second shaft 30 journaled on the frame parallel with shaft 19 and having a gear engaging a beveled gear concentric with the fulcrum-shaft of the frame, and sprocket connections between shafts 19 and 30 and between said beveled gear and a truck-axle.

11. The combination with a loader comprising a tiltable conveyer-frame mounted on a wheeled truck, of an inclined conveyer pivotally connected with said truck and having a movement radially thereof, said conveyer having its lower end disposed beneath the discharge of the loader and its upper end at a point above said discharge, and a frame for the conveyer having wheels to travel upon the ground or supporting-surface.

In witness whereof I have hereunto set my hand.

THOMAS M. PARK.

Witnesses:
J. H. CAMERON,
E. L. DAWSON.