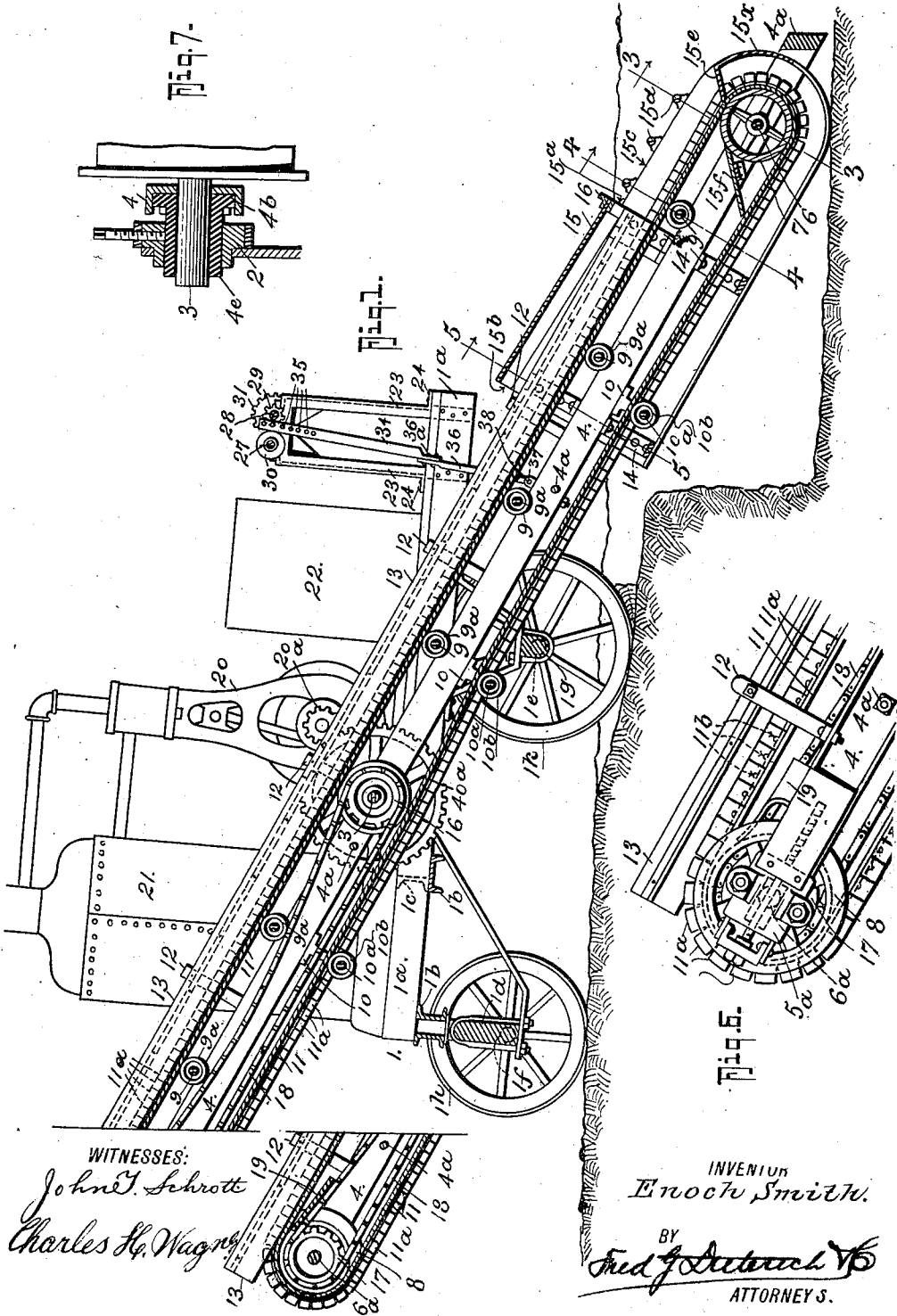


E. SMITH.  
LOADING MACHINE.  
APPLICATION FILED MAY 7, 1910.

993,418.

Patented May 30, 1911.

3 SHEETS—SHEET 1.



WITNESSES:

*John T. Schrott*  
*Charles H. Wagner*

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*Enoch Smith*

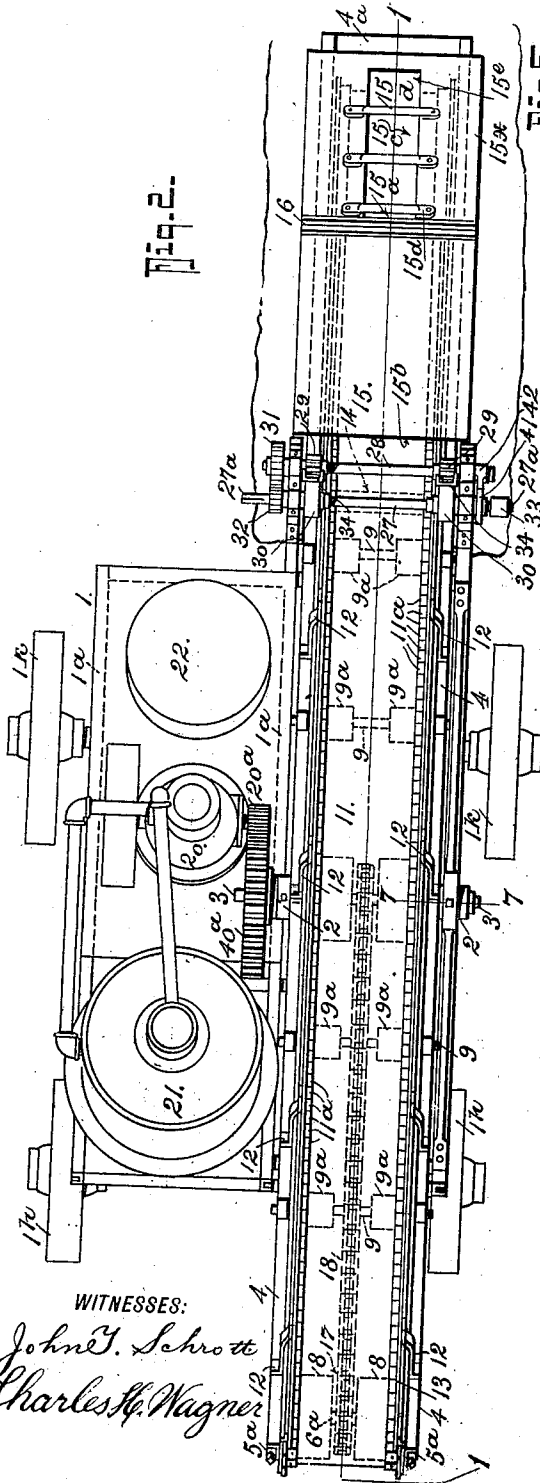
BY  
*Fred J. [Signature]*  
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993,418.

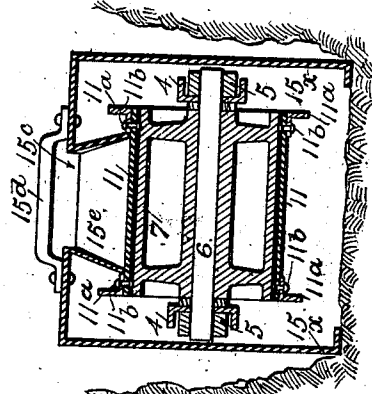
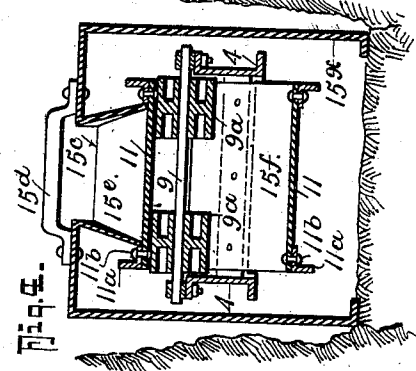
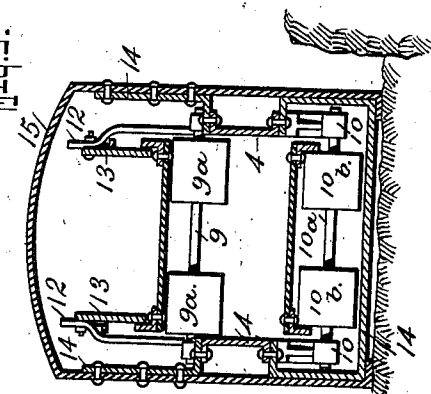
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3 SHEETS-SHEET 2.



WITNESSES:  
*John T. Schrott*  
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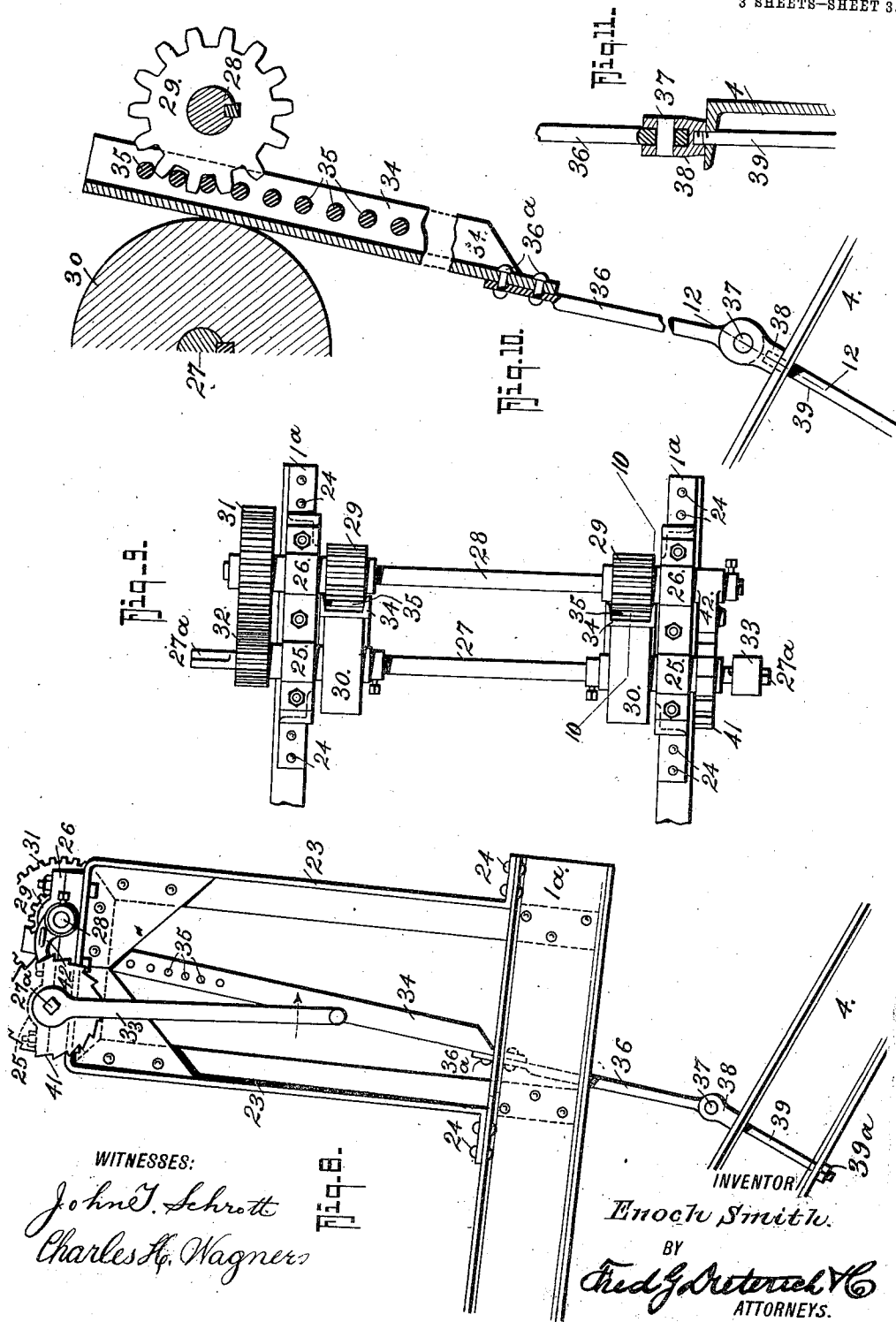
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3 SHEETS-SHEET 3.



# UNITED STATES PATENT OFFICE.

ENOCH SMITH, OF SALT LAKE CITY, UTAH.

## LOADING-MACHINE.

993,418.

Specification of Letters Patent. Patented May 30, 1911.

Application filed May 7, 1910. Serial No. 560,021.

### *To all whom it may concern:*

Be it known that I, ENOCH SMITH, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Loading-Machines, of which the following is a specification.

My invention relates to certain new and useful improvements in loading machines for use in excavating operations, grading, etc., and the invention has for its object to provide a simply constructed machine that may be constructed at a minimum expense and will be effective in its operation.

The invention comprises a wheeled truck on which a power plant is disposed, such power plant consisting of an engine, fuel tank, boiler, etc. An elevator of a peculiar construction is also mounted on the truck to convey the dirt from the ground into suitable receptacles or vehicles to be hauled away. The elevator, which forms an essential part of my invention, is constructed of a frame of channel iron on which idler pulleys are supported and which also carries the end drums over which the endless conveyer belt passes. The main drive shaft for the conveyer passes through trunnions on the elevator frame, which trunnions are mounted in bearings on the truck to pivotally mount the elevator frame thereon. The conveyer drive shaft is geared up with the engine in any suitable way. The main drive shaft is geared up with the conveyer belt pulleys by a sprocket and chain drive or in any other suitable way. Suitable side-boards or guides are provided for the conveyer and the belt is also provided with side plate sections to assist in retaining the dirt on the belt. The conveyer at its entrant or loading end is provided with a boot and housing, the housing having openings for the entrance of the dirt and the boot serving to insure an even deposit of dirt on the conveyer during the elevating operation.

In its more subordinate nature the invention comprises those novel details of construction, combination and arrangement of parts, all of which will be first fully described, then be pointed out in the appended claims and illustrated in the accompanying drawings, in which:

Figure 1, is a longitudinal section on the line 1-1 of Fig. 2. Fig. 2, is a top plan view of the invention. Figs. 3, 4 and 5 are

sections respectively on the lines 3-3, 4-4 and 5-5 of Fig. 1. Fig. 6, is a detail view of the adjustable bearing for the driving shaft of the conveyer drums. Fig. 7, is a detail section on the line 7-7 of Fig. 2. Fig. 8, is an enlarged detail side elevation of the mechanism for raising and lowering the elevator. Fig. 9, is a top plan view of the raising and lowering mechanism. Fig. 10, is an enlarged detail section on the line 10-10 of Fig. 9. Fig. 11, is a detail section on the line 12-12 of Fig. 10.

Referring now to the accompanying drawings in which like letters and numerals of reference indicate like parts in all of the figures, 1 designates the truck which is constructed of an angle iron frame consisting of the longitudinal beams 1<sup>a</sup>, the under beams 1<sup>b</sup> and the cross beams 1<sup>c</sup>. The beams 1<sup>a</sup> support the trucks 1<sup>d</sup> and 1<sup>e</sup> that have the front and rear axles 1<sup>f</sup>-1<sup>g</sup> respectively on which axles the wheels 1<sup>h</sup>-1<sup>i</sup> are respectively mounted. The truck 1 supports the power plant, which may be of any type. As shown in the drawing, it consists of the engine 20, the boiler 21 and tank 22. The truck 1 has trunnion bearings 2-2 through which the main drive shaft 3 projects.

The elevator proper is constructed of a frame formed by the longitudinal channel irons 4 that are suitably joined together by braces 4<sup>a</sup> and to which channel irons the trunnion plates 4<sup>b</sup> are secured, see Fig. 7 of the drawings. The plates 4<sup>b</sup> carry trunnions 4<sup>c</sup> which project into the bearings 2 and are apertured to act as bearings for the main driving shaft 3.

Mounted on the lower end of the channel irons 4 are adjustable bearings 5 in which a shaft 6 is mounted, the shaft 6 carrying a drum 7 around which an endless belt 11 passes. At the other end the conveyer is provided with adjustable bearings 5<sup>a</sup> for the drum shaft 6<sup>a</sup> on which a pair of drum sections 8 are mounted. Between the drum sections 8 a driving sprocket 17 is located.

Mounted in suitable bearings along the upper surface of the channel irons 4, and at suitable intervals, are shafts 9 carrying idlers 9<sup>a</sup> over which the conveyer belt 11 passes. Suitable idlers 10<sup>b</sup> mounted on shafts 10<sup>a</sup> held in brackets 10 are beneath the beams 4, serve to support the under side of the conveyer belt 11 at suitable intervals.

13 designates side boards that are sup-

ported over beams 4 by brackets 12, the sideboards serving to confine the dirt to the conveyer belt 11 and in order to prevent dirt from getting under the sideboards the conveyer belt 11 is provided with angle plates 11<sup>a</sup> that are secured at 11<sup>b</sup> to the belt, the angle plates lying edge to edge along the straight line of the belt, and by forming them of sections the passing of the belt around the end pulleys or drums is not interfered with.

At the lower or entrant end of the conveyer is a casing 15<sup>x</sup> having a boot portion 15 so as to protect the lower end of the conveyer from injury. The casing 15<sup>x</sup> and boot 15 are suitably supported on the channel irons 4 by brackets 14 and the casing 15<sup>x</sup> has an opening or throatway 15<sup>e</sup> guarded by grate bars 15<sup>d</sup> through which the dirt is admitted to the conveyer belt 11, a deflector 15<sup>e</sup> being provided to prevent the dirt dropping down into the boot and casing bottoms. A dirt catcher and deflector 15<sup>f</sup> is located adjacent to the pulley 7 to convey any dirt that may fall through the conveyer onto the deflector to one side of the conveyer and prevent it working between the conveyer and drum. It will be observed the boot 15 has an entrance 15<sup>a</sup> protected by an angle iron 16, which entrance is of lesser height than the exist end 15<sup>b</sup> of the boot for a purpose that will hereinafter appear more clearly.

A sprocket 16 on the main shaft 3 is connected with the sprocket 17 on the pulley shaft 6<sup>a</sup> by an endless sprocket chain 18, or any other suitable power transmission mechanism may be employed. The shaft 3 is driven from the engine 20 by a gear and pinion 40<sup>a</sup>—20<sup>a</sup> respectively, it being understood that the engine or power plant is provided with the usual controlling devices which *per se*, form no part of my present invention.

In operation it is only necessary to dig a trench large enough to receive the booted end of the conveyer, as shown in Fig. 3 of the drawings, after which the dirt to be loaded is dumped over the booted end and gravitates through the opening 15<sup>e</sup> on to the conveyer, the guarded end 15<sup>a</sup> of the boot serving to limit the depth of dirt on the conveyer belt 11 that passes through the boot and angle iron 16 serving, as it were, as a pusher to prevent more than a predetermined amount of dirt passing through the boot, thus limiting the dirt on the conveyer to an even stream as the conveyer carries the dirt from the entrant end to the discharge end and delivers it into the vehicle by means of which it is taken away.

It will be observed that by my construction a simple and effective elevator is provided that may be transported readily from place to place and used in any and all kinds of excavating operations doing away with

the necessity of loading vehicles by hands and insuring greater speed in loading. The provision of the boot serving to keep the dirt level on the conveyer prevents the spilling of the dirt over the conveyer, due to uneven loading at different places.

A suitable guard or deflector 19 is provided for preventing dirt getting between the belt and pulleys 8, as shown in Figs. 1 and 3 of the drawings.

In Figs. 8 to 11 inclusive is best shown the mechanism for raising and lowering the booted end of the conveyer, and by reference particularly to these figures, it will be noticed that on the truck frame irons 1<sup>a</sup> U-shaped supports 23 are mounted. These supports are secured at 24 to the beams 1<sup>a</sup> and are provided with bearing boxes 25—26 for the respective shafts 27—28. The shaft 28 carries pinions 29 at each side and the shaft 27 carries rollers 30 alining with the pinions 29. The shafts 27—28 are geared together by gears 31—32. Motion is imparted to the shaft 27 by a crank 33 that may be attached to either end 27<sup>a</sup> of the shaft, and the shaft 27 may be held from rotation in one direction by a ratchet and pawl device 41—42.

Projecting between the rollers 30 and pinions 29 are channel irons 34, the backs of which engage the rollers 30, while the pinions 29 project into the grooves of such channel irons and engage cross rivets 35 that form a rack of the angle irons 34. The channel irons 34 are connected by rods 36 that are secured at 36<sup>a</sup> to the channel irons 34 and are pivoted at 37 to the bifurcated heads 38 of the rods 39 that project through the channel irons 4 and are secured at their lower ends by nuts 39<sup>a</sup>.

In practice when it is desired to raise the booted end of the conveyer, the crank 27<sup>a</sup> is turned in the direction of the arrow in Fig. 9 to impart motion to the shaft 27 which is transmitted through the gears 32—31 to the shaft 28, thus causing its pinions 29 to raise the rack 34 and correspondingly elevate the booted end of the conveyer 4. The pawl 42, engaging the ratchet disk 41, prevents the backward movement of the rack 34 and holds the conveyer in the required position.

In this application, I make no claim *per se* to the specific rack and pinion devices shown in Fig. 8 *et seq.*, as such will form the subject matter of a divisional application.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete construction, operation and numerous advantages of my invention will be readily understood by those skilled in the art to which the invention appertains.

What I claim is:

1. In a loading machine, a conveyer frame, pulleys carried at the ends of said

frame, an endless belt passing over said pulleys, means for driving said belt, a casing extending over one end of said belt, means for mounting said casing on said conveyer 5 frame and spacing the top and side walls of said casing from said conveyer, said casing having a loading opening in its top through which dirt is admitted to said conveyer, plates carried by said casing and diverging 10 from said loading opening toward said conveyer, said plates terminating adjacent to said conveyer, substantially as shown and described.

2. A loading machine including a truck 15 having trunnion bearings, a conveyer having trunnions mounted in said trunnion bearings, a main drive shaft journaled in said trunnions, said conveyer including a longitudinal frame having bearings at its ends, 20 pulley shafts in said bearings, pulleys on said shafts, an endless conveyer belt taking over said pulleys, sideboards supported on said frame for said belt, a boot carried by said frame at one end of said conveyer for 25 leveling the dirt on said conveyer as it is deposited on said conveyer at said end, the area of the opening of the entrant end of said boot being less than that at the exit end of said boot.

3. In a loading machine, a conveyer frame, pulleys carried at the ends of said frame, an endless belt passing over said pulleys, means for driving said belt, an open bottom casing supported by said conveyer frame over 35 one end of said belt, said casing including a boot for leveling the dirt, said casing having a loading opening in advance of said boot, and guard members held over said opening.

4. In a loading machine, a conveyer frame, pulleys carried at the ends of said frame, an endless belt passing over said pulleys, means for driving said belt, a casing over one end 40 of said belt, said casing including a boot for leveling the dirt, said casing having a loading opening in advance of said boot, said boot having its top spaced closer to said belt at the entrant end than at the exit end of 45 said boot.

5. In a loading machine, a conveyer frame, pulleys carried at the ends of said frame, an endless belt passing over said pulleys, means for driving said belt, a casing over one end 50 of said belt, said casing including a boot for leveling the dirt, said casing having a loading opening in advance of said boot, sideboards carried by said frame and extending 55 from the entrant end of said boot through said boot to the exit end of said conveyer frame, the lower edges of said sideboards being held adjacent to said conveyer belt.

6. In a loading machine, a conveyer frame, pulleys carried at the ends of said frame, an endless belt passing over said pulleys, means 60 for driving said belt, a casing over one end

of said belt, said casing including a boot for leveling the dirt, said casing having a loading opening in advance of said boot, said boot having its top spaced closer to said 70 belt at the entrant end than at the exit end of said boot, sideboards carried by said frame and extending from the entrant end of said boot through said boot to the exit end of said conveyer frame, the lower edges 75 of said sideboards being held adjacent to said conveyer belt.

7. In a loading machine, a conveyer frame, pulleys carried at the ends of said frame, an endless belt passing over said pulleys, means for driving said belt, a casing over one end 80 of said belt, said casing including a boot for leveling the dirt, said casing having a loading opening in advance of said boot, sideboards carried by said frame and extending from the entrant end of said boot through 85 said boot to the exit end of said conveyer frame, the lower edges of said sideboards being held adjacent to said conveyer belt, and angle members secured to the edges of said belt to embrace said sideboards when 90 adjacent thereto.

8. In a loading machine, a conveyer frame, pulleys carried at the ends of said frame, an endless belt passing over said pulleys, means for driving said belt, a casing over one end 95 of said belt, said casing including a boot for leveling the dirt, said casing having a loading opening in advance of said boot, sideboards carried by said frame and extending from the entrant end of said boot through 100 said boot to the exit end of said conveyer frame, the lower edges of said sideboards being held adjacent to said conveyer belt, angle members secured to the edges of said belt to embrace said sideboards when adjacent 105 thereto, said angle members having their side edges to lie in contact with one another when adjacent to said sideboards to form a continuous closed side guard for said belt when embracing said sideboards. 110

9. In a loading machine, a conveyer frame, pulleys mounted at the ends of said frame, an endless belt passing around said pulleys, 115 fixedly held sideboards carried by said frame and held adjacent to the upper side of said belt, angle members secured to the edges of said belt to embrace said sideboards when 120 adjacent thereto, said angle members consisting of a flat portion secured to the belt and a portion projecting at right angles to said flat portion, said projecting portion having side edges normal to the plane of 125 said belt, said angle members being held in close juxtaposition whereby said side edges will contact with one another when said angle members are embracing said sideboards.

10. In a machine of the character stated, a supporting truck having trunnion bearings, a conveyer including longitudinal chan- 130

nel irons spaced apart and braced together, trunnions carried by said channel irons and received by said trunnion bearings, a main driving shaft journaled in said trunnion bearings an endless belt conveyer supported by said channel irons, means for driving said conveyer, and a boot supported by said channel irons over one end only of said conveyer to limit the level of dirt on said conveyer as it passes through said boot, and a dirt deflector held by said channel irons and projected under the conveying side of said belt at the end adjacent to said boot.

11. In a machine of the character stated, a supporting truck having trunnion bearings, a conveyer including longitudinal channel irons spaced apart and braced together, trunnions carried by said channel irons and received by said trunnion bearings, a main driving shaft journaled in said trunnion bearings, an endless belt conveyer supported by said channel irons, means for driving said conveyer, a boot supported by said channel irons over one end only of said conveyer to limit the level of dirt on said conveyer as it passes through said boot, a dirt deflector held by said channel irons and projected under the carrying side of said belt at the end adjacent to said boot, and sideboards carried by said angle irons for the conveying side of said belt, said sideboards projecting into said boot.

12. In a machine of the character stated, a supporting conveyer frame, an endless belt conveyer carried thereby, means for driving said conveyer, and an open bottom boot supported by said frame over one end of said conveyer to limit the level of dirt on said conveyer, as it passes through said boot.

13. In a machine of the character stated, a supporting conveyer frame, an endless belt conveyer carried thereby, means for driving said conveyer, an open bottom boot supported by said frame over one end of said conveyer to limit the level of dirt on said conveyer as it passes through said boot, and sideboards carried by said frame for the conveying side of said conveyer said side-

boards extending from said boot to the opposite end of said conveyer.

14. In a machine of the character stated, a supporting conveyer frame, an endless belt conveyer carried thereby, means for driving said conveyer, means for pivotally mounting said frame, means for raising and lowering said frame, a casing including a boot supported by said frame over the entrant end of said conveyer to limit the level of dirt on said conveyer as it passes through said boot, said casing including a guarded loading opening in advance of said boot, said casing having an open bottom.

15. In a loading machine, a truck having trunnion bearings, a conveyer frame having trunnions mounted, in said trunnion bearings, belt pulleys mounted at the ends of said frame, an endless belt passing around said belt pulleys, a main driving shaft journaled in said trunnions, sprocket and chain connections between said driving shaft and said belt pulley at one end of said conveyer frame, and a dirt deflector held between said sprocket chain and the dirt conveying side of said belt and projecting to the outside of said conveyer frame, and means for securing said deflector to said conveyer frame.

16. In a loading machine, a truck having trunnion bearings, a conveyer frame having trunnions mounted in said bearings, belt pulleys at the ends of said frame, an endless belt conveyer passing around said pulleys, a casing held over the entrant end of said conveyer frame and belt, the walls of said casing being spaced from said frame and belt, said casing having a loading opening, said casing having inwardly projecting side walls for said opening, said side walls terminating adjacent to said conveyer belt and being spaced apart at said conveyer belt a greater distance than at said loading opening.

ENOCH SMITH.

Witnesses:

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JNO. R. WINDER.