No. 776,825. PATENTED DEC. 6, 1904.

F. D. BUFFUM.

CAR LOADER.

APPLICATION FILED MAR. 24, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

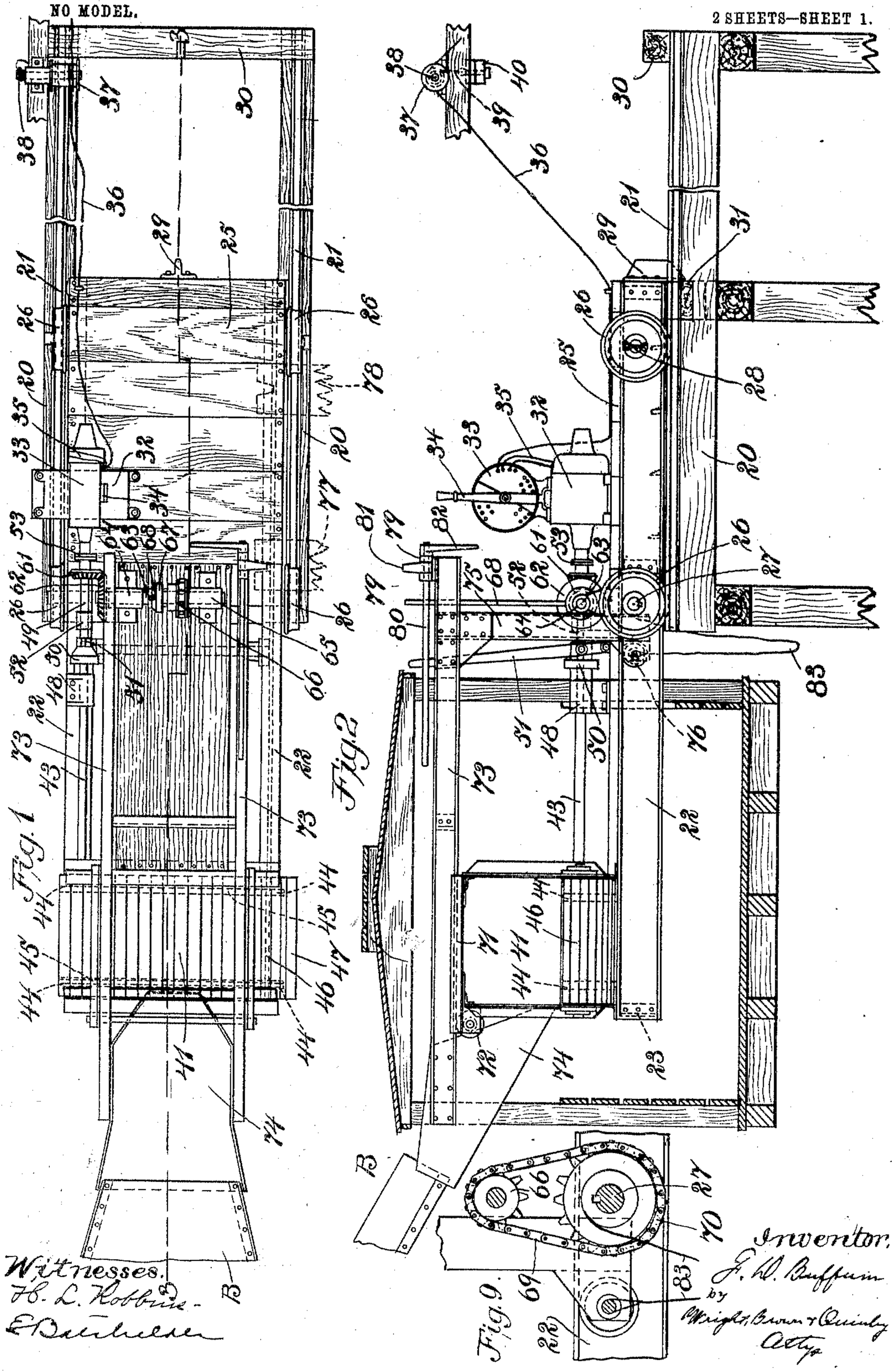

Fig. 1

Fig. 2

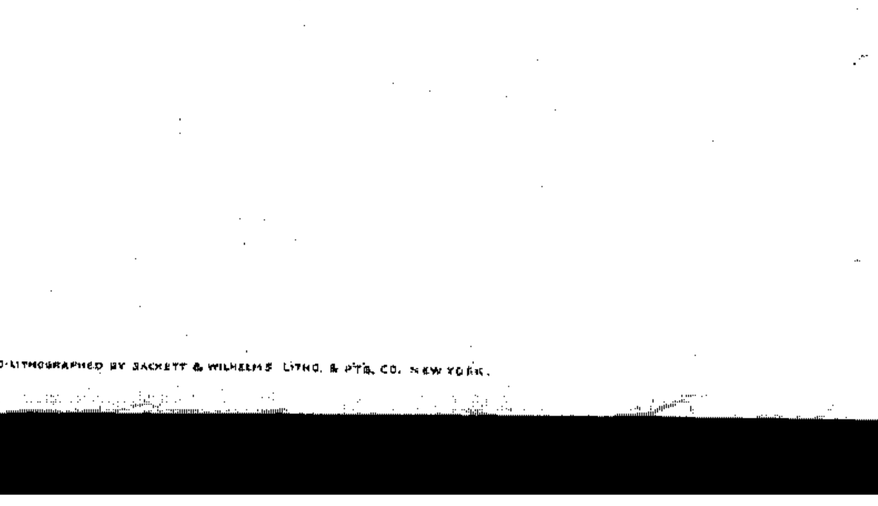

Fig. 9.

Witnesses.
H. C. Robbins
E. Burleigh

Inventor.
F. D. Buffum
by Wright, Brown & Quinby
Attys.

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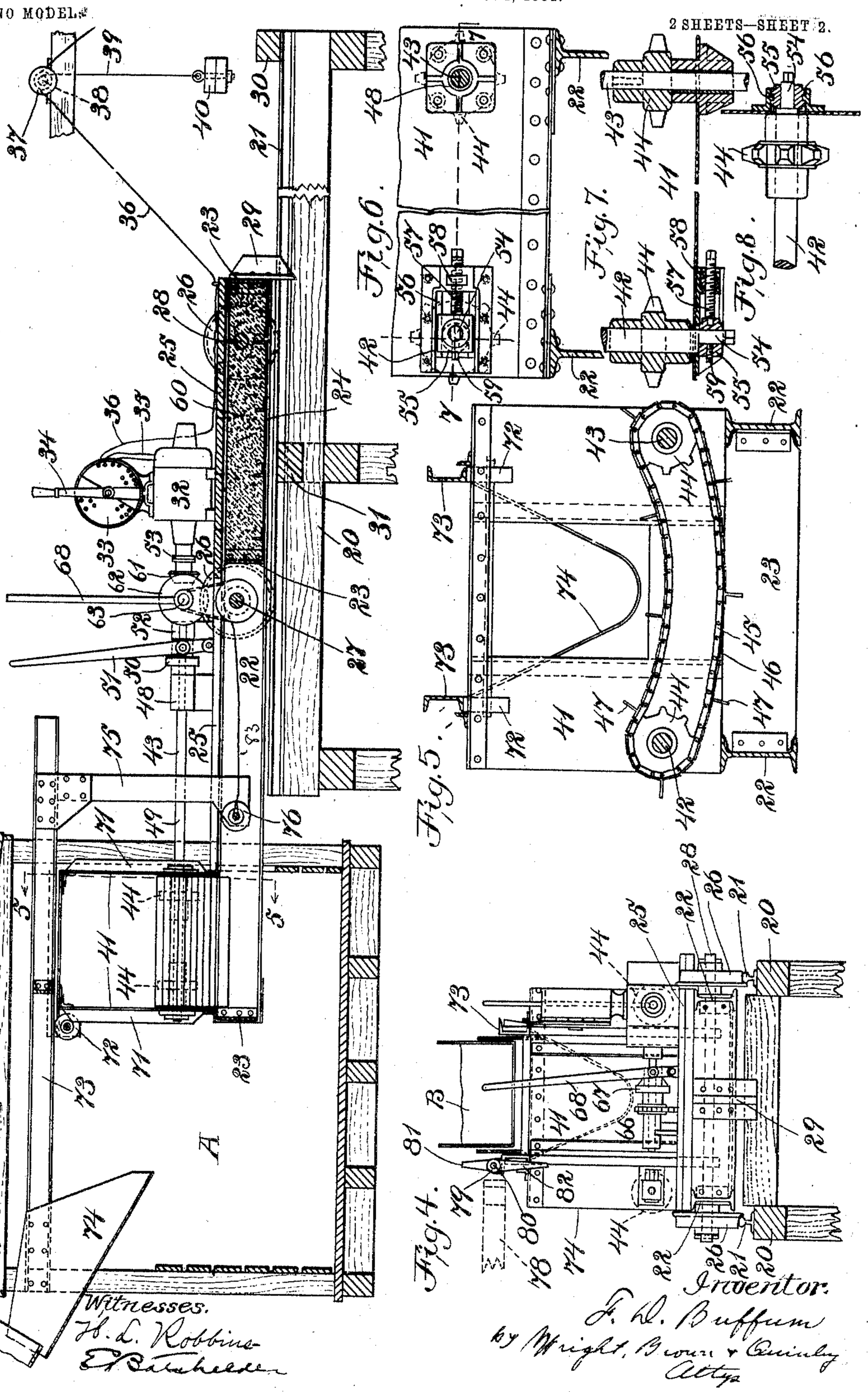

Fig. 3.

Fig. 5.

Fig. 4.

Fig. 6.

Fig. 7.

Fig. 8.

Witnesses.
H. L. Robbins
E. Batcheller

Inventor:
F. D. Buffum
by Wright, Brown & Quinby
Attys

No. 776,825. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK D. BUFFUM, OF NEWTON, MASSACHUSETTS.

CAR-LOADER.

SPECIFICATION forming part of Letters Patent No. 776,825, dated December 6, 1904.

Application filed March 24, 1904. Serial No. 199,735. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK D. BUFFUM, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Car-Loaders, of which the following is a specification.

This invention relates to machines for loading cars, and has particular reference to that class of machines which include an endless conveyer for throwing the coal or other material toward one end or the other of a railroad-car, the material being deposited on the conveyer by a chute entering the side of the car opposite that from which the distributer is introduced and operated.

The object of my present invention is to provide a machine of this character which shall be of comparatively low cost, efficient in operation, and easy to manipulate both in respect to placing the mechanism in position for operation and in obtaining the best results in loading the car evenly and rapidly.

A particular object of the invention is to provide a structure in which the chute which receives the coal from the tipple and delivers it to the distributing-conveyer is so mounted that it is carried by the carriage of the distributer so as to be introduced to working position from the same side of the car as that from which the loader is introduced.

A further object of the invention is to provide an apparatus of this character in which the relative positions of the distributer-conveyer and the delivering-chute may be quickly altered, so that after the conveyer has been used to fill each end of the car it may be separated therefrom, leaving the coal to automatically run down the same chute and fill the middle portion of the car.

A further object of the invention is to provide an apparatus of this character in which the conveyer is fixed in its relation to its support or carriage, said conveyer being short enough from one end to the other to enable it to be introduced through a car-door of ordinary width without turning said conveyer in order to get it through such door.

A further object of the invention is to provide a car-loader having relatively movable feed-chute and hopper, the latter containing the distributing mechanism, the frame of the chute resting on and supported by the hopper-frame, whereby the parts may be easily manipulated and an overhead support is afforded for the chute.

Other minor objects of the invention will appear hereinafter in connection with the detailed description of the several parts of the apparatus.

To these ends the invention consists in the construction and combination of parts, substantially as hereinafter described and claimed.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a plan view of an apparatus embodying my invention in a preferred form. Fig. 2 represents a side elevation of the same, a portion of the body of a car being represented in section, the distributer and the feeding-chute being in the position which they would occupy relatively to the car when the distributer is being used to throw the coal to either end of said car. Fig. 3 represents a section on line 3 3 of Fig. 1, said figure showing also a section of a car, the relative positions of the feed-chute and distributer mechanism being those which they would occupy after the ends of a car have been loaded and the feed-chute is being used to cause the material to fill the middle portion of the car by gravity. Fig. 4 represents an end view from the right of Fig. 1, the bumper, however, being omitted. Fig. 5 represents a section on line 5 5 of Fig. 3, but drawn to a larger scale. Fig. 6 represents a detail elevation of the hopper of the distributing mechanism, showing the means for taking up slack of the conveyer. Fig. 7 represents a section on line 7 7 of Fig. 6. Fig. 8 is a detail view looking from the left of Fig. 7 and showing the shaft-bearing block in section. Fig. 9 is a detail view of the connections for imparting forward and backward movements to the front carriage-axle.

Similar reference characters indicate similar parts throughout the several views.

A car of the box-car type is represented at A, and the usual tipple-chute is indicated at B.

For many reasons, chiefly trackage arrange-

ments, it is preferable to arrange coal-loading mechanism entirely on the opposite side of a car-track from the location of the tipple-chute. These reasons are well known and need not be further referred to herein.

A suitable stationary frame 20 is provided for the rails 21, on which the carriage of the loader is mounted, so as to enable the distributing mechanism to be introduced through one side door of a box-car. The carriage is shown as comprising I-beams 22, connected by suitable cross-beams 23. The rear end of the carriage (at the right in Figs. 2 and 3) is shown as provided with a suitable bottom plate 24, while the entire upper portion of the carriage-frame excepting that which carries the conveyer is shown as provided with suitable platform-boards 25. The wheels 26 of the carriage are supported by front and rear axles 27 and 28, respectively, the carriage being suitably weighted, as will be hereinafter described, to prevent it from being tilted from the rails 21. At the rear end the carriage is formed with a lug 29, projecting downward between the rails and adapted to limit the forward and backward movements of the carriage by contacting either with a suitable bumper 30 or a stop-beam 31, crossing the stationary frame below the rails 21. Heretofore it has been customary to prevent excessive movement of the carriage of a car-loader by curving the ends of the front portions of the rails upward. This is not only a somewhat difficult operation, but it necessitates the projection of the rails forward permanently to a point where such curved ends necessarily diminish the clearance of passing cars.

Mounted upon the platform of the carriage is a motor 32. (Represented in the drawings as an electric motor of an ordinary type.) I wish it to be understood, however, that while I prefer an electric motor for operating the loader a compressed-air or a steam motor might be employed without departing from any principle of my invention.

A controller and controller-lever are indicated, respectively, at 33 and 34 and the circuit-wires at 35. The cable 36 for the feed-wires passes over a drum 37, mounted on a suitable support, preferably elevated, and from thence to the dynamo. (Not shown.) The shaft of the drum 37 is indicated at 38, and on said shaft is wound a cord 39, to which are connected suitable weights 40. Obviously if an air or steam motor were employed the conduit for the motive fluid would be similarly manipulated, so that the forward and backward movements of the carriage may occur without possibility of cutting off the supply of power. In the case of an electric motor if the feed-wire cable were to get under the carriage-wheels and be cut thereby there would probably be disastrous results to the workmen, besides causing delay until the necessary repairs should be made.

Secured to the I-beams 22 at the front end thereof is a hopper 41, the walls of which support the bearings for two shafts 42 and 43. The bearings of the shaft 42 are adjustable toward and from the shaft 43, as will be hereinafter described; but said shaft 42 is secured in said bearings, so that it cannot rotate. The shaft 43 receives power and rotates in its bearings. Sprockets 44 are mounted on the shafts, those which are on the shaft 42 being loosely mounted thereon, while the sprockets on the shaft 43 are secured so as to rotate therewith, as by a key or spline. (Represented by dotted lines in Fig. 7.) Sprocket-chains 45 are carried by the sprockets 44, and the two chains 45 are connected by slats 46 and at suitable intervals by T-iron projections 47. The chains, slats, and T-iron projections constitute the distributing-conveyer, which conveyer is actuated in either one direction or the other by the motor 32, which itself may be readily reversed by the usual well-known means—that is, when the conveyer is to be utilized to load one end or the other of the car its direction of movement is controlled by controlling the direction of movement of the motor itself. I shall now proceed to describe the connections between the conveyer and the motor. The shaft 43 is mounted in a bearing 48, supported on the platform 25, and is adapted to be connected with or disconnected from a shaft 49 by means of a cut-off or clutch 50, having an operating or controlling lever 51. The shaft 49 is mounted in a bearing 52 and is connected by a flange-coupling 53 with the motor-shaft. It will therefore be understood that with a continuously-running motor the stopping and starting of the conveyer may be controlled by means of the lever 51.

Referring to Fig. 7, it will be seen that one end of the shaft 42 has a reduced and eccentric projecting end 54. Of course the other end of said shaft has a similar eccentric projecting end and may be adjusted in the same manner, as will be presently described. The eccentric end 54 projects through a box 55 adjustable along suitable ways 56, supported by the hopper, the said box being moved lengthwise of the ways by means of a screw 57, having a squared outer end for a wrench, said screw passing through a nut 58, fitted in a suitable recess in the casting of the ways 56. A set-screw 59 passes through one wall of the box 55 and bears against the eccentric projection 54 of the shaft 42. These two adjustments are for the following purposes: It is usual to have the car-tracks in front of a tipple at a slight grade. This necessarily causes one end of a car that is to be loaded to be higher than the other end. Of course when my improved apparatus is set up the support-

ing-framework or other parts may be suitably arranged to correspond with any grade of the car-track; but to secure accurate loading of the ends of the car it is sometimes desirable to vary the angle of the throw of the endless conveyer. This angle can be adjusted by rotatively adjusting the fixed shaft 42. By loosening the set-screws 59 and applying a suitable wrench to the squared end of the eccentric projection 54 the shaft 42 may be rotated, so as to raise or lower the two sprockets 44, carried by said shaft and which, as before stated, are loose on said shaft 42. By then setting up the screws 59 the adjustment obtained will be rendered permanent. By varying the positions of the boxes 55 along the ways 56 by means of the screws 57 any undesirable slack of the conveyer may be taken up. It will also be readily understood, of course, that when the tension on the conveyer is varied, so that it is more or less slack, the coal will be thrown therefrom higher or lower, as may be desired. With the conveyer moving at a given rate of speed of course the coal will be thrown to a greater distance if the conveyer is somewhat slackened.

As indicated in Fig. 3, the bottom plate 24, which may be either a continuous plate or of expanded metal, is strengthened by suitable cross-angle beams. This floor is preferably strengthened because I employ the space above it and between the rear beam 23 and the intermediate beam 23 to contain a quantity of suitable weighting material, which will serve to load down the rear end of the carriage to prevent it from being tilted up by the weight of the conveyer mechanism and the coal thereon or by the weight of the feed-chute and its supports, which are yet to be described. The space mentioned above the floor 24 may be filled with cement or cement and sand or any cheap and plastic material which will harden into a solid mass. Such material as described possesses the advantage not only of a somewhat preservative effect upon the steel of the framework which incloses it, but it is easily placed in position and also affords a firm foundation for the platform-boards 25, on which the motor rests.

Referring chiefly to Figs. 1 and 2, a bevel-pinion 61 is secured upon the shaft 49, said pinion meshing with a bevel-gear 62 on a shaft 63, mounted in a bearing 64, supported upon the platform of the carrier. In alinement with the bearing 64 is a bearing 65, which supports the hub of a sprocket 66. Between said hub of the sprocket and the end of the shaft 63 is a clutch 67, operated, by means of a lever 68, to connect or disconnect the sprocket 66 from the shaft 63, which is of course constantly rotated from the motor. Referring to Fig. 9, it will be seen that the sprocket 66 is connected, by means of a chain 69, with a sprocket 70 on the front axle 27 of the carriage. It will therefore be understood that if the carriage is to be projected or retracted the lever 51 will be moved to separate the clutch 50, and so disconnect the conveyer mechanism from the motor-shaft, and the lever 68 will be operated to bring the sprocket 66 into conjunction with the driving connections with the motor, which motor, as before stated, may be rotated in either direction and may be therefore employed to project or retract the carriage through the connections just described and including the chain 69.

I will now proceed to describe the means for supporting and operating the feed-chute relatively to the hopper and the distributing mechanism therein.

At the top of the hopper are horizontal angle-irons 71, each angle-iron having suitable bearings at one end for loosely supporting a wheel 72. The wheels 72 support the horizontal beams 73 of the chute-frame, the two beams 73 being connected by suitable cross-braces and also through the medium of the feed-chute 74, which is supported by the outer ends of the said beams 73. Depending from the inner ends of the horizontal beams 73 are the vertical beams 75, which I preferably term the "legs" of the chute-frame. Mounted at the lower ends of the legs 75 are rollers 76, which engage under and ride along the inner upper flanges of the I-beams 22 of the carriage-frame. It will now be understood that if the chute and chute-frame are moved relatively to the hopper and carriage, as indicated by comparing Figs. 2 and 3, the wheels 72 will permit such movement with comparative freedom, while the rollers 76 will prevent the rear end of the chute-frame from tipping up. As just stated, the chute and chute-frame are movable relatively to the hopper and carriage; but such movement is of course in the direction of the tracks provided to permit such movement. While lateral displacement of the chute-frame is prevented by the relative arrangements of the wheels 72, beams 73, legs or beams 75, rollers 76, and the beams 22 of the carriage-frame, I do not herein claim means for preventing lateral displacement of the chute-frame in an apparatus of this character, as the same is claimed in my application, filed April 26, 1904, Serial No. 205,054.

By referring particularly to Figs. 2, 4, and 5 it will be seen that the feed-chute 74 is of such shape as to receive the coal from the tipple-chute B and discharge it in not too excessive quantities through the wall of the hopper 41 onto the conveyer, where the coal will be thrown toward one end or the other of the car, according to the direction of movement of the said conveyer, and of course it will be understood that the operator will so control the parts that first one and then the other end of the car will be filled. By gradually reducing the speed of the conveyer the coal may be easily delivered where wanted and gradually from the end of the car toward the

center or toward the end of the conveyer. When the two ends of the car have been filled to the desired elevations, the rotation or movement of the conveyer will be stopped and the power transferred, through the chain 69, to the front carriage-axle, so as to retract the distributer to the position shown in Fig. 3. In the meantime, however, the chute-frame has been locked by means which I will presently describe, so that the feed-chute will remain in the position indicated in Fig. 3, where it may continue to supply coal by gravity to the central portion of the car and to such a height therein as that when the chute is later withdrawn from the car in a direction toward the right of Fig. 3 the end of the chute will scrape off or level the pile of coal at the middle of the car, so as to fill up entirely across said middle.

I will now describe the means for holding the feed-chute and its frame while the carriage and distributer are being withdrawn.

It is customary with apparatus of this type to erect over the stationary frame 20 a suitable house or shed for protecting the mechanism when the latter is not in a car and also for protecting the operator. From a suitable portion of such house or shed I provide a projecting beam, as represented at 77. (See dotted lines in Fig. 1.) I may sometimes provide a second notched beam, as indicated by the dotted lines at 78, for a purpose which I will hereinafter describe. Mounted in bearings 79 on the rear end of one of the beams 73 of the chute-frame is a shaft 80. Splined on said shaft 80 and prevented from longitudinal movement relatively to the beam 73 is a stop 81, the connection with the shaft 80 being such that rotation of the shaft 80 by means of a handle 82 will cause the stop 81 to engage the notch of the beam 77 when the operator desires and when the chute-frame is in the position shown in Fig. 3. Obviously when the stop 81 is engaged with the notched beam the chute-frame will be prevented from being moved toward the right in Fig. 3 when the distributing apparatus is being moved from the position shown in Fig. 2 to the position shown in Fig. 3. The reason for employing a shaft 80 of some length and having the stop 81 splined thereon is to enable the operator to have the handle 82 of the shaft within reach in case he remains on the platform near the motor. By retaining his hold of the handle 82 while the carriage is moving backward and he is upon it the shaft 80 will slide through the bearings 79, and then at the desired time he can rotate the shaft 80, so as to disengage the stop 81 from the notched beam 77 or release the handle.

Secured to the axle of one of the rollers 76 is a wire rope 83, the upper end of which is secured to the hub of the sprocket 70. This wire rope is of such length and so connected that when the parts are in the position shown in Fig. 3 said rope will be just about drawn taut. If now the loading has been completed and the operator removes the stop 81 from the notched beam 77 and applies the power to withdraw the carriage until the lug 29 contacts with the bumper 30, the rotation of the axle 27 will cause the wire rope 83 to wind up on the drum of the sprocket and draw the chute and chute-frame outward more rapidly of course than the carriage and the distributer is being retracted. Finally, when the entire rear position has been reached the chute 74 will stand in the same relation to the hopper 41 as is shown in Fig. 2; but the entire mechanism will then be of course entirely outside of the car. When the mechanism is to be introduced into a car, the carriage and distributer will be projected by the motor to the position indicated in Fig. 2, provided no obstruction to the advance of the chute-frame retards the latter. Should the latter occur, said chute-frame may be pushed forward by hand. This may quite readily be done, since an empty car presents no obstacle to such inward movement. As above described, however, a pile of coal deposited at the middle of the car by the chute 74 when the parts are in the position indicated in Fig. 3 would require power to level it off to finish the loading operation. For this purpose the automatic shortening of the connection 83 by the power-driven withdrawal of the carriage withdraws the chute and causes the automatic leveling of the last of the load.

It will be observed (see particularly Fig. 4) that the handle 82 is considerably longer than the stop 81 and that the two are so fixed to the shaft 80 and relatively to each other that the handle 82 will act as a weight to automatically rotate the shaft to disengage the stop from the notched detent 77 and to keep it out of the plane thereof when the operator releases said handle.

As above described, the notched beam 77 serves as a detent to coöperate with the stop 81 to hold the chute-frame in its forward position while the distributer-carriage is being moved. The second or rearward notched beam 78 may be engaged by the same stop 81 when the carriage is entirely withdrawn and the chute-frame is partially withdrawn and if it be desired to hold the latter while the carriage is being projected to bring the hopper 41 close to the chute 74.

There are several advantages in arranging the supply or feed chute so that it will be carried by although movable relatively to the carriage or loader frame. One is the saving in time which results from having the chute always in the correct position for whatever operation is required and yet locating the said chute where it will never be in the way of the operator or the moving of any of the parts of the mechanism. Heretofore with the most approved kinds of adjustable chute carried on

the tipple and arranged to be projected into the car it has required some five minutes or so to get the chute into position for supplying material to the distributer. During this time no mine-cars can be dumped on the tipple, for the chute is not ready to handle coal. The capacity of car-loaders for coal is only limited by the speed with which mine-cars can be dumped. Consequently there is no compensation for time lost in the manner just described. Another advantage of my improved construction is that while heretofore it has been difficult to give the adjustable tipple-chutes sufficient length and inclination so as to place coal on the loader and still not be of such length as to render it difficult to swing them out of the car without interfering with the boards or the adjustable grain-door used to close up the car-door my arrangement of the supply or feed chute carried by the loader-frame enables a relatively short feed-chute to be employed and with ample inclination to properly place the coal on the distributer.

I claim—

1. A car-loader comprising a distributing mechanism, a carriage therefor to enable it to be advanced and retracted, and a feed-chute and chute-frame, the latter being carried by and movable relatively to said carriage, the chute being free to be adjusted toward and from the distributing mechanism to permit the entire separation of the chute from the said mechanism while supported by the carriage to enable material to be deposited by the chute in the space between it and said mechanism.

2. A car-loader comprising a distributing mechanism, a receiving-hopper above said distributing mechanism, a carriage for supporting the said hopper and distributing mechanism, said carriage being movable to enable it to be advanced and retracted, and a feed-chute and chute-frame, the latter being carried by and movable relatively to said carriage and extending over the hopper and supported thereby.

3. A car-loader comprising a distributing mechanism, a receiving-hopper above said mechanism and having rollers or wheels mounted at its upper portion, a carriage for supporting the said hopper and mechanism, said carriage being movable to advance and retract it from a car, and a feed-chute and chute-frame, the latter being carried by and movable relatively to said carriage and extending over the hopper and supported by the said rollers or wheels.

4. A car-loader comprising a movable carriage adapted to be projected through a car-door, a single conveyer supported by the forward end of the carriage in a substantially horizontal position and fixed relatively to said carriage, said conveyer being endless and of a length not to exceed the width of a car-door, and means for actuating said conveyer in either direction transverse of the forward end of the carriage.

5. A car-loader comprising a movable carriage adapted to be projected through a car-door, a single endless conveyer supported in fixed position by the forward end of the carriage and transverse thereof, one of the supporting-shafts of said endless conveyer being adjustable toward and from the other, to take up slack and vary the angle at which material will be delivered from said conveyer.

6. A car-loader comprising a movable carriage adapted to be projected through a car-door, a single endless conveyer supported in fixed position by the forward end of the carriage and transverse thereof, one of the supporting-shafts of said endless conveyer being vertically adjustable to vary the angle at which material will be delivered from said conveyer.

7. A car-loader comprising a movable carriage adapted to be projected through a car-door, a single endless conveyer supported in fixed position by the forward end of the carriage and transverse thereof, one of the supporting-shafts of said endless conveyer having eccentric ends, boxes receiving and supporting said eccentric ends, and means for securing the eccentric ends in said boxes in adjusted position as required to vary the height of the portion of the shaft traversed by the endless conveyer.

8. A car-loader comprising a distributing mechanism, a carriage therefor to enable it to be advanced and retracted, a feed-chute carried by and movable relatively to said carriage, and means for positively moving the chute outward relatively to the carriage to cause said chute to automatically level a pile of coal at the center of the car.

9. A car-loader comprising a wheeled carriage, a distributing mechanism carried thereby, means for advancing and retracting the carriage, a feed-chute and chute-frame, the latter being carried by and movable relatively to said carriage, and a flexible connection leading from a portion of the chute-frame and connected with one of the carriage-axles to be wound up by the latter when the carriage is retracted.

10. A car-loader comprising a distributing mechanism, a carriage therefor to enable it to be advanced and retracted, a feed-chute and chute-frame, the latter being carried by and movable relatively to said carriage, a stop carried by the chute-frame, and a fixed detent adapted to be engaged by said stop to hold the chute-frame stationary while the carriage is being adjusted.

11. A car-loader comprising a distributing mechanism, a carriage therefor to enable it to be advanced and retracted, a feed-chute and chute-frame, the latter being carried by said carriage and movable relatively thereto, a shaft supported by the chute-frame and provided

with a stop and a handle, the latter being of a length to act as a weight to hold the shaft and its stop normally in a predetermined position, and a fixed detent adapted to be engaged by said stop to hold the chute-frame stationary while the carriage is being adjusted.

12. A car-loader comprising a carriage, an endless conveyer mounted on the forward end of the carriage and transverse thereof, a motor mounted on the carriage, the shaft of said motor being in alinement with one of the shafts of the conveyer, whereby the motor may directly drive the conveyer, and a coupling between said shafts and having means whereby the operator may connect and disconnect said coupling.

13. A car-loader comprising a carriage, an endless conveyer mounted on the forward end of the carriage and transverse thereof, a motor mounted on the carriage, a divided shaft having a clutch adapted to directly connect the motor with one of the shafts of the conveyer, the motor-shaft having a bevel-pinion, a transverse shaft having a bevel-gear meshing with said pinion and having also a sprocket, a sprocket on one of the carriage-axles, a chain connecting the two sprockets, the said transverse shaft being a divided one and having a clutch.

14. A car-loader comprising a wheeled carriage, a distributing mechanism supported by a forwardly-projecting portion of said carriage, the said carriage having a space or chamber provided in its rear portion below the flooring or upper surface thereof, and a filling of plastic material in said space or chamber, to prevent the tilting of said carriage by the mechanism at the forward end thereof.

15. A car-loader comprising a carriage having its frame formed of side beams and cross-beams, a bottom plate connecting said beams at the rear end of the carriage, a platform supported by the upper edges of said beams, a cement filling in the space between said beams, bottom plate, and platform, and a distributing mechanism supported by the other end of said frame.

16. In an apparatus of the character described, the combination with a carriage having a distributer mechanism, of a track upon which said carriage is adapted to be reciprocated, a lug projecting downward from said carriage below the plane of the track, and two separated fixed stops adapted to coöperate with said lug and the rear end of the carriage for limiting the forward and backward movements of the carriage.

17. In an apparatus of the character described, the combination with a carriage having a distributer mechanism, of a motor for operating said mechanism, the motor being mounted upon said carriage to travel therewith, and flexible means for conveying power to said motor, a take-up being provided for said flexible power-conveying means to prevent accidental cutting off of the power by the wheels of the carriage.

18. In an apparatus of the character described, the combination with a carriage having a distributer mechanism, of an electric motor for operating said mechanism, the motor being mounted upon said carriage to travel therewith, an elevated drum, a cable for supplying the current to the motor, a drum upon which said cable is wound, and means for automatically actuating said drum to take up the slack of the cable when the carriage is moving backward, said means permitting the cable to be unwound from the drum when the carriage is moving forward.

19. A car-loader comprising a carriage, a distributing mechanism supported by a forwardly-projecting portion of said carriage, the said carriage having a space or chamber provided in its rear portion, and a weight-filling in said space or chamber, to prevent the tilting of said carriage by the mechanism at the forward end thereof.

20. A car-loader comprising a carriage, a distributing mechanism supported by a forwardly-projecting portion of said carriage, and a steadying-weight carried by the rear portion of the carriage for preventing the tilting of the carriage and side sway thereof, and for absorbing vibrations due to the action of the distributing mechanism.

In testimony whereof I have affixed my signature in presence of two witnesses.

FREDERICK D. BUFFUM.

Witnesses:

A. W. HARRISON,

JAS. H. CHURCHILL.