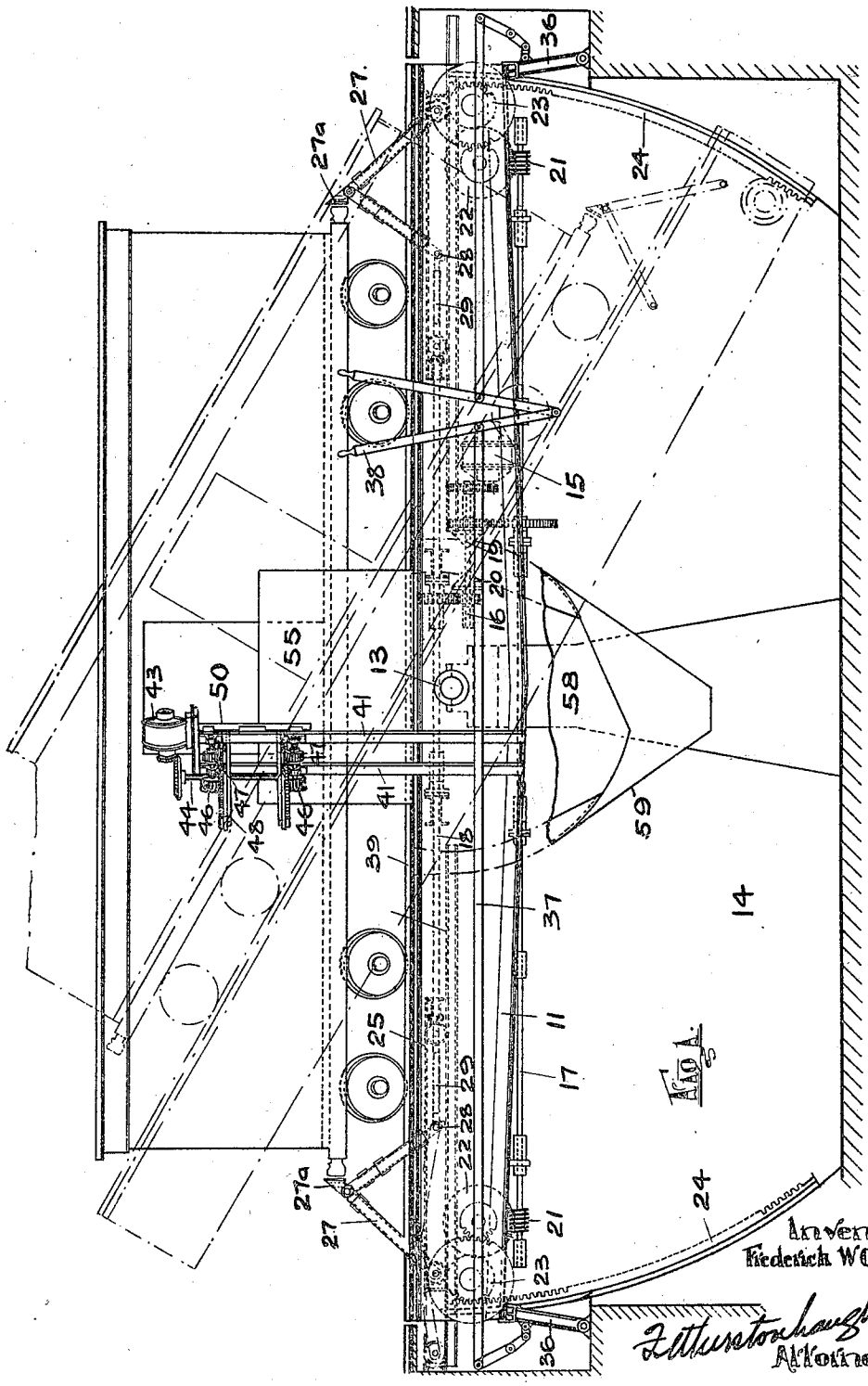
July 8, 1924. 1,500,673

F. W. COWIE

CAR UNLOADING DEVICE

Filed Dec. 13, 1920 4 Sheets-Sheet 1



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CAR UNLOADING DEVICE

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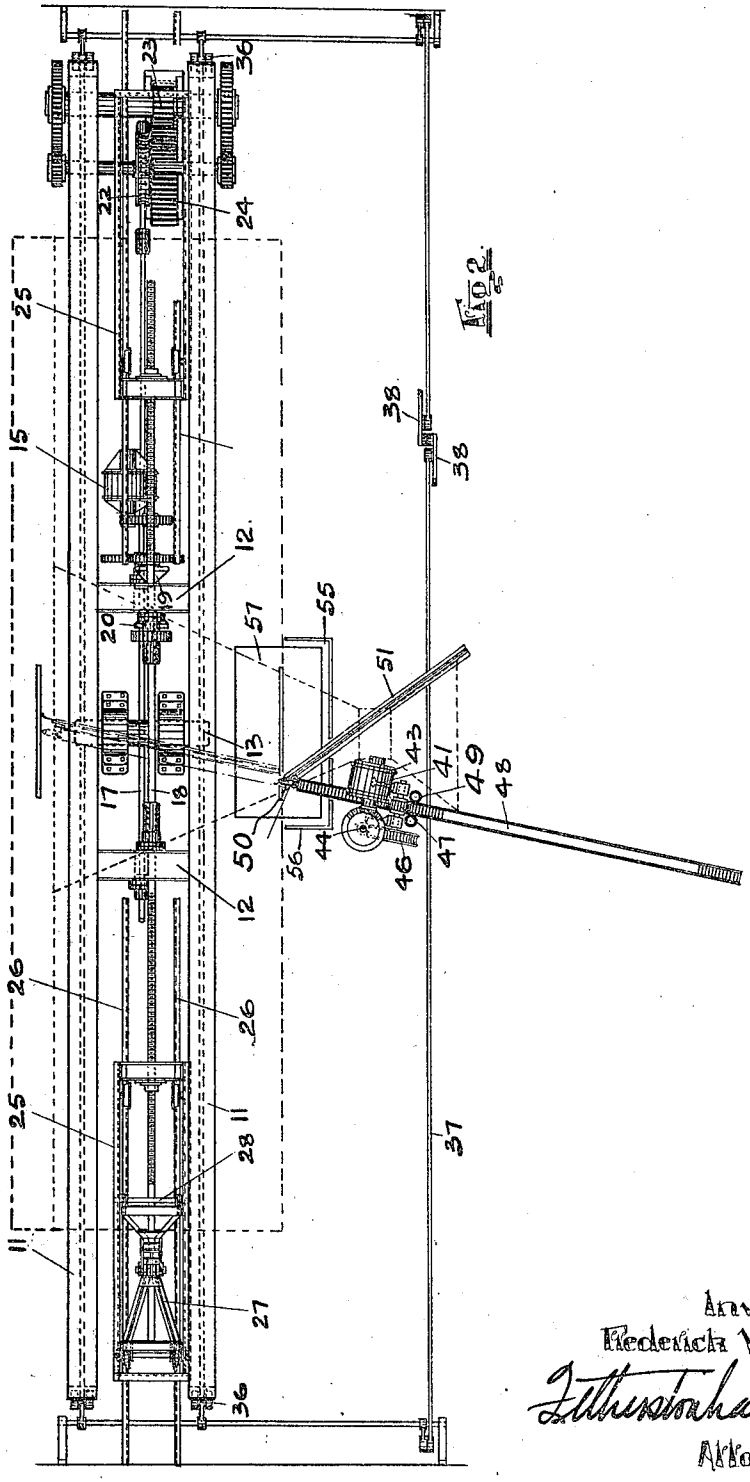


Fig. 2.

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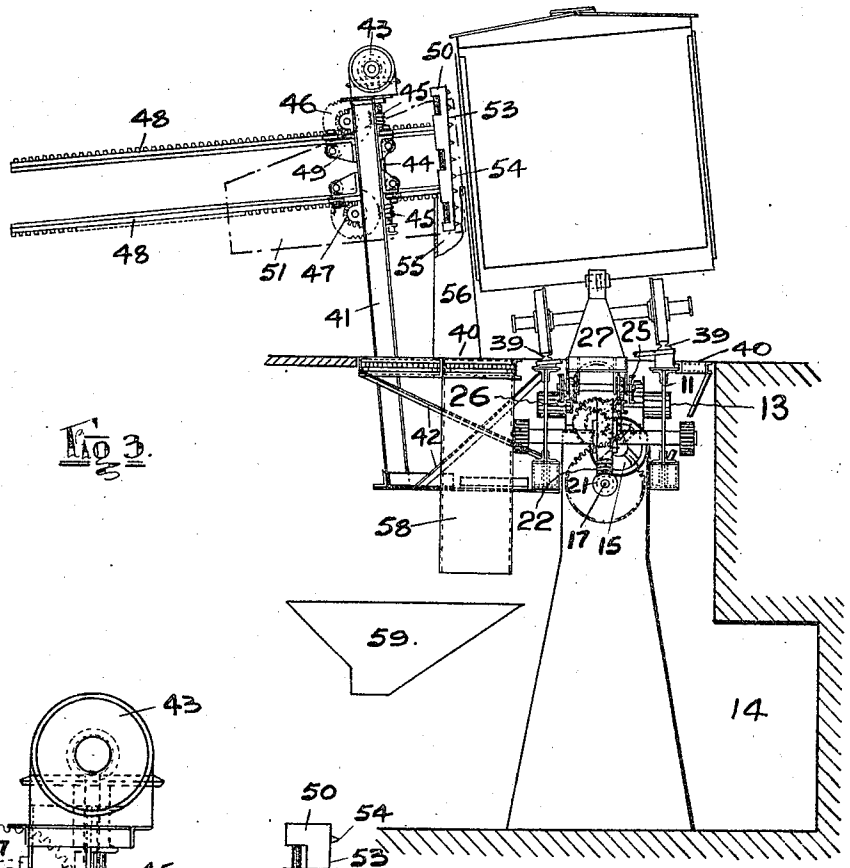


Fig 3.

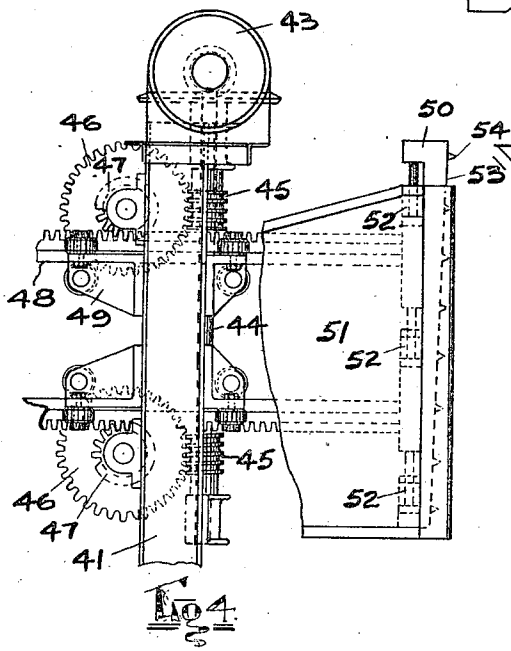


Fig 4.

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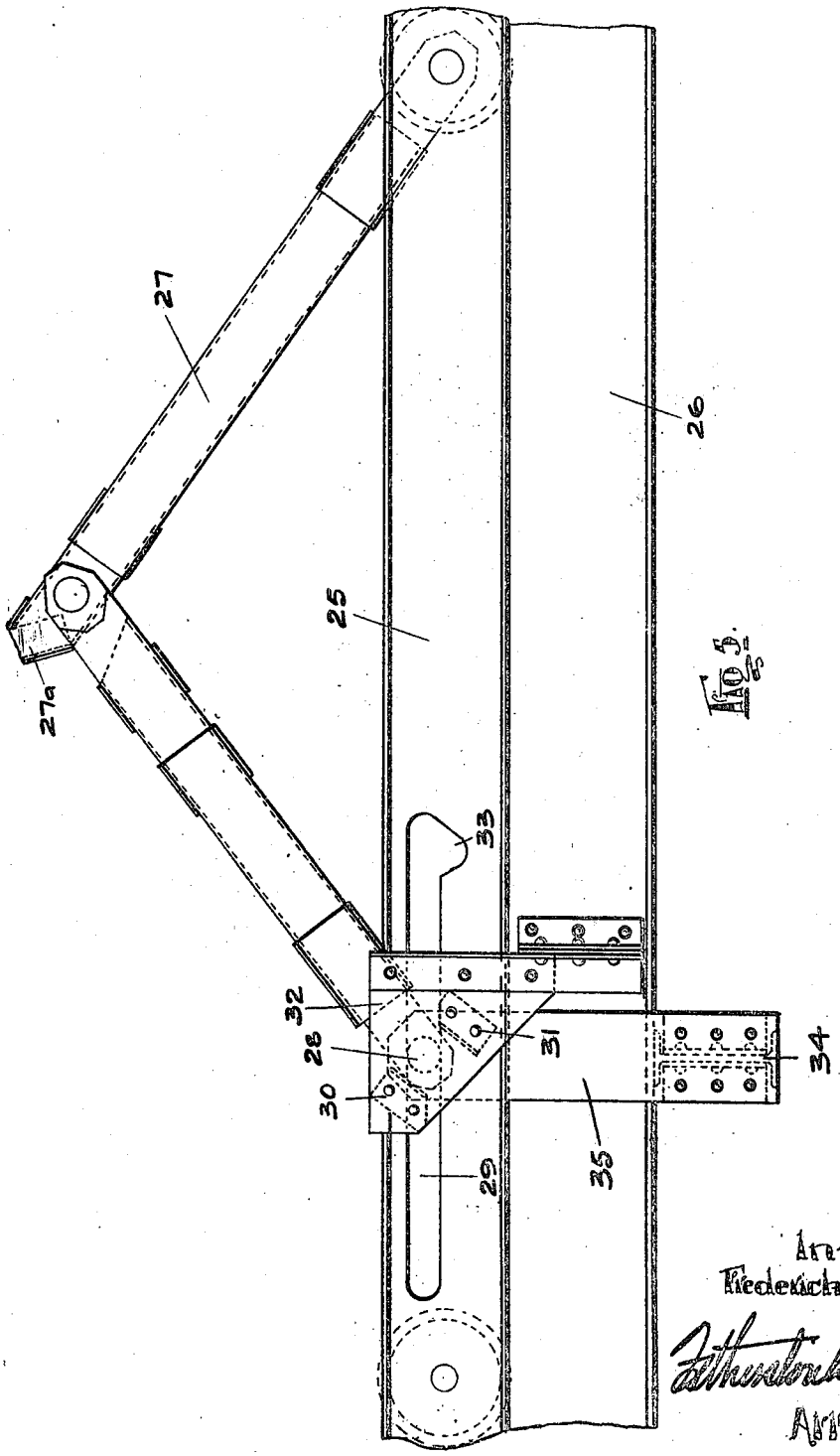


Fig. 5.

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Patented July 8, 1924. 1,500,673

UNITED STATES PATENT OFFICE.

FREDERICK W. COWIE, OF MONTREAL, QUEBEC, CANADA.

CAR-UNLOADING DEVICE.

Application filed December 13, 1920. Serial No. 430,296.

To all whom it may concern:

Be it known that I, FREDERICK W. COWIE, a subject of the King of Great Britain, and resident of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Car-Unloading Devices, of which the following is a full, clear, and exact description.

This invention relates to improvements in devices for unloading grain and the like from cars, and the object of the invention is to provide means for quickly and completely unloading the car without hand-shovelling.

A further object is to provide means for automatically removing the inner or grain doors of the cars. Various other objects and advantages will be apparent from the following description.

The device consists briefly of a tilting table adapted to hold a car rigidly in position thereon, and a mechanically operated baffle plate with means for forcibly inserting the same in a car to remove a grain door and permit emergence of the grain.

In the drawings which illustrate the invention:—

Fig. 1 is a side elevation of the device showing a car in position thereon.

Fig. 2 is a plan view of the table and mechanism thereon, the position of the car being indicated in broken lines.

Fig. 3 is an end elevation of the device.

Fig. 4 is an enlarged elevation of the baffle operating mechanism.

Fig. 5 is an enlarged side elevation, partly in section, of the car placing and holding means.

Referring more particularly to the drawings, 11 designates a pair of heavy plate girders connected together by transoms 12 and pivotally mounted at their centres on a pin 13 suitably supported in the upper part of a pit 14. At any suitable point, for example between the girders, a motor 15 is provided preferably driving a counter shaft 16, which may be connected to or disconnected from shafts 17 and 18 by clutches 19 and 20 respectively. The clutches may be of any suitable type, their position only being indicated, and the driving connections between the counter shaft and the shafts 17 and 18 may be according to the dictates of circumstances. The shafts 17 and 18 preferably extend substantially parallel with and between the girders. Conveniently the shaft 17 may be located below the shaft 18 as shown, the shafts being, of course, supported for revolution in suitable bearings. The shaft 17 carries toward each end thereof a worm 21 meshing with a worm wheel 22 which drives, through a suitable gear train, the pinion 23. This pinion meshes with a grooved rack 24 rigidly mounted at the end of the pit 14 and circularly curved from a centre in the axis of the pin 13. It will thus be seen that there is a rack and pinion mechanism at each end of the pit and that by operating the motor one end or the other of the girder pair will be drawn down into the pit by the pinion travelling on the rack, so that the girder pair will be inclined as shown in broken lines, Figure 1. By operating the motor in the opposite direction the girder pair may be inclined in the opposite direction.

The shaft 18 is screw-threaded at its opposite ends, the threads being of opposite hand. The screw-threaded portions of the shaft operatively engage at each end with a carriage 25 and movable in the longitudinal direction of the girders on rails 26. Each carriage supports a very strong toggle lever 27, the outer end of the lever being connected to the outer end of the carriage and the inner end of the lever is connected to a transverse shaft 28 slidably supported toward the inner end of the carriage in slots 29. The ends of this shaft project beyond the carriage and engage at certain times between lugs 30 and 31 carried by brackets 32 supported from the rails 26 upon which the carriage travels. The upper lug or projection 30 projects downwardly into the plane of the slot and shaft, as clearly shown in Figure 5, while the upper ends of the lugs 31 are at about the level of the bottoms of the slots 29. The inner end of each slot is provided with a depression or notch 33 adapted to receive the shafts 28. A beam 34 is suspended from the shaft by plates 35 and is located below the tracks 26 to hold the carriage against jumping off the tracks.

Stops or rests 36 are pivotally mounted at each end of the pit in position to swing under and support the ends of the girders. These rests are connected by any suitable means 37 with suitably disposed operating levers 38.

Track rails 39 are mounted upon the girders, one of these rails being at a higher level than the other, so that a car standing thereon will be tilted laterally. As this lateral tilting of the car will throw the centre line of the under-frame out of the longitudinal centre line of the track the toggle levers and their carriages, which are designed to engage the couplers of a car, are located slightly nearer the lower rail, as clearly shown in Figures 2 and 3. Suitable platforms 40 for operators are carried at the remote sides of the girders.

The girder supporting the lower rail 39 carries at some distance from it and at a suitable point in its length, a column 41 supported by bracings 42 forming a very strong bracket. This column is approximately perpendicular to the inclined transverse plane of the track and will therefore be substantially parallel with the side of a car standing on said track. The column carries a reversible motor 43 geared to a shaft 44 upon which are vertically spaced right and left hand worms 45 meshing with worm wheels 46 having driving connection with pinions 47. A pair of heavy rack-toothed bars 48 are supported on the column by suitably disposed guide rolls 49 and are in mesh with the pinions 47, whereby said racks may be moved. These racks travel in planes parallel with the plane of the track but do not move exactly transversely of the track. The angular relation between these racks and the track is clearly shown in Figure 2, and is such that the racks will pass through the doorway of a standard box car, standing on the track, close against the jamb and if extended across the car will strike the far car door at substantially its centre line. This is clearly illustrated in Figure 2. The ends of the racks adjacent the track are rigidly connected by a strong post 50, to which a suitably formed baffle plate 51 is hingedly connected in such a manner that the plate may lie close against the racks 48 when the same are extended as shown in dot and dash lines, Figure 2. The lower edge of this plate is designed to lie parallel with the floor of a car standing on the tracks and as car floors are nearly all of the same height only a small amount of adjustment will be necessary. This adjustment is obtained automatically by making the hinge lugs 52 of the baffle plate shallower than the recesses in the post 50 in which they operate, so that the plate may have a certain rise and fall. The leading edge 53 of the post is not quite parallel with the side of a car but is nearer the car at the top than at the bottom, as shown in Figure 3. This edge is provided with teeth 54.

A shield 55 is carried by the platform 40 between the column 41 and the position occupied by the side of a car and is provided with wings 56 which will fill the spaces between the shield and the sides of a car. An opening 57 is provided in the platform between the shield and the track and a chute 58 leads from this opening to a hopper 59 located in the pit and adapted to serve any suitable form of conveyor (not shown).

The operation of the device is as follows:—The girders, which form a tiltable table, are arranged horizontally and the rests 36 inserted under the ends thereof. The toggle levers are flattened out and the racks 58 retracted to the position shown in Figure 3. A car of grain or other material to be unloaded is run onto the table and located approximately in the centre thereof. The motor 15 is started in the proper direction and the clutch 20 thrown in to operate the shaft 18 and draw the carriages 25 toward the centre of the table. The outer ends of the toggles being supported by the carriages are drawn in while the inner ends of the toggles are held by the shafts 28 engaging the lugs 30. In this way the toggles are raised from the flattened position shown in the dot and dash lines on the left hand end of Figure 1 through the intermediate position shown in Figure 5 to the fully elevated position shown in Figure 1 which brings the buffers 27^a of the toggle into alignment with the couplers of the car. When the carriages have been moved to fully elevate the toggles the slots 29 thereof have been moved past the shafts 28 until the notches 33 are under the shafts and the shafts drop into these notches. This dropping of the shafts releases them from engagement with the lugs 30 and brings them into position between the lugs 31 at opposite ends of the table. Continued movement of the carriages will now draw the elevated toggles bodily toward the centre of the table until they engage the couplers of the car and shift the car until it is exactly centered on the table and one of its side doors opposite the shield 55. The clutch is now thrown out. The cross beams 34 suspended from the carriages under the tracks 26 keep the thrust of a car against the toggles from lifting the carriages off the tracks.

The sliding door of the car is opened and the motor 43 started in the appropriate direction to drive through the racks 48 and force the post 50 against the grain door or inner door of the car at a point as close as possible to one of the door jambs. The teeth 54 bite into the material of the grain door, which is usually wood, and the advancing post drives one end of the door inwardly against the contents of the car thus drawing the nails with which the door is usually secured. The difference between the inclination of the car side and the leading edge of the post results in the boards of which the door is usually formed being freed successively from the top downwards. Ob-

viously all the boards may be freed simultaneously or the bottom board freed first. Preferably, however, the topmost board is loosened first so that as soon as its end is freed the grain behind it may flow around the freed end and escape, thus relieving the pressure. In this way the grain door is freed from one jamb of the car doorway with a comparatively small expenditure of power, the grain flowing out around the freed end of the door and reducing the pressure against the door. The grain which escapes flows out through the car doorway and is directed by the shield 55 and its wings into the opening 57. As the post advances across the car floor in the angular direction previously described it swings the grain door around its point of attachment to the other door jamb and gradually withdraws the securing nails. The pressure of grain flowing out around the loosened end of the grain door presses against the shield 55 and swings it to about the angle shown in full lines Figure 2. It will be understood, however, that the door is not at the angle shown in full lines Figure 2 when withdrawn from the car but assumes this position only by the pressure of grain against it. By the time the post has advanced into contact with the far or closed door of the car, the grain door at the loaded side has been completely separated from the car and has been carried forward by the engagement of the teeth 54 therein. As soon as the baffle plate has been carried completely across the car the motor 43 is stopped.

When the clutch 20 is thrown out the rests 36 are withdrawn from under the girders and the clutch 19 immediately thrown in so that the motor drives the shaft 17 to impart movement through the gear train 22 to the pinion 23 and cause the same to draw itself down on the curved rack at the right hand end of the device, so that the table and car thereon are tilted to the position shown in dot and dash lines, Figure 1. In this tilted position the car is held securely by the toggles 27. As the column 41 is fixed relatively to the table it is obvious that the relation of the column to the car is not altered in any way. It will be noted by comparision of Figures 1 and 2 that the edge of the doorway against which the racks 48 operate is now elevated so that not only the grain immediately at the loosened end of the grain door but all the grain from the doorway to the elevated end of the car rushes toward the doorway and presses against the baffle plate 51 which swings by gravity and by the pressure of the grain against the lower door jamb. The inclination of the car is sufficient for all the grain therein to run out through the doorway, this movement being assisted by the lateral inclination of the car. While the tilting of the car and opening of the grain door have been described in sequence it will be understood that they occur simultaneously and are so timed that the baffle 51 is carried completely across the car at, or shortly before, the maximum inclination is obtained. In this way one half of the car is unloaded. No grain will lie upon the sharply sloping car floor unless it be a small amount lying against the lower edge of the baffle plate. Any such small amount of grain may be withdrawn in a second or two by a hand-scraper without it being necessary for the operator to enter the car. With freely flowing material such as wheat, the elevated end of the car will be completely empty by the time the baffle has been moved across the car.

The direction of the motor 15 is now reversed and the car swings to horizontal position, whereupon, the pinion at the right hand end disengages its rack and the pinion at the left hand end engages its rack and draws the left hand end of the car down until an inclination equal and opposite to the first is attained. As the car rights itself the pressure of grain in the lower or loaded end is directed upon the baffle plate owing to the fact that the grain door has been wrenched free from the door jamb. This grain pressure causes the baffle plate to swing to a position close against racks 48 as shown in broken lines, Figure 2. As soon as the elevation of the loaded end commences the grain rushes toward the doorway and is directed out by the baffle plate as before. With free flowing material the entire contents of the second end of the car will have run out by the time the maximum inclination is attained. The out-rushing grain carries with it the grain door which may be rescued by an operator standing at the doorway or may be allowed to pass through the chute 58 and be separated from the grain in the hopper. Any small amount of grain which lies against the baffle may be scraped out as previously described.

As soon as the second end of the car is empty the motor 15 is reversed to return the car to horizontal position. While the car is being righted the motor 43 is started in a reverse direction to retract the post 50 and baffle plate. This retraction will be complete at, or slightly before, the time the car reaches horizontal. When the table returns to horizontal position the rests 36 are inserted under it to relieve the tilting gear of unnecessary stresses. The clutch 19 is now thrown out and the clutch 20 thrown in and upon the motor being operated in the appropriate direction the shaft 18 will revolve and force the carriages 25 toward the ends of the girders. In the first part of this

movement the toggles travel bodily in their folded position until the shafts 28 resting in the notches 33 strike the inclined lugs 31 and are lifted out of the notches. Continued carriage movement draws the slots 29 along the arrested shafts so that the toggles are flattened out. The car is now entirely clear and may be replaced by another one which will be operated upon as previously described. The rests 36 relieve the inclining gear of the shifting loads during change of cars.

From the foregoing description it will be seen that a car may be very quickly and easily unloaded without recourse to manual labor. As a matter of fact, the time required from the placing of a full car to its removal empty will be under five minutes. This celerity of action is due to the fact that all manual handling and placing of the car is entirely eliminated. The buffers which block the car in position on the table operate automatically to centre the car. The freeing of the grain door and the insertion of the unloading baffle occur simultaneously with the first tilting of the car and the removal of the grain door simultaneously with the second tilting of the car. The removal of the baffle plate from the empty car occurs simultaneously with the righting of the car preparatory to removal. The control of the whole apparatus is extremely simple and as it is by way of controlling the direction and stopping and starting of the motors 15 and 43 it is obvious that this control may be located at any convenient point without complication of mechanism. The rests 36 are merely precautionary and it is clear that their use may be omitted during the shifting of cars but it is practically a necessity to insert these rests if the greater weight of a locomotive is passed over the device. The structure is simple and rugged and will operate to unload from any side door car any granular substances, such as ore, coal, gravel, sand and the like as well as the grain which has heretofore been mentioned. With less freely flowing material, such as ore or coke, a much greater inclination of the car will be required than with free flowing materials such as hard coal or grain.

Having thus described my invention, what I claim is:—

1. In a car unloading device, a rockable platform supported above a pit of a size to receive the ends of the platform during rocking movement thereof, vertically disposed racks positioned in the pit at opposite ends of the platform, pinions carried by the platform meshing with said racks, and driving means for the pinions.

2. In a car unloading device, a rockable platform and a toggle mechanism adapted in unfolded position to give passage to a car and in folded position to provide car-retaining stops, said toggle mechanism being in duplicate and comprising, in each instance, a pair of bars pivotally secured together at one end, a stop carried by the bars at the said secured end, and means connecting the remaining ends of the bars to the frame in such manner that the said bars may be moved relatively to one another to collapsed condition or may be moved as a unit along the length of the platform.

3. In a car unloading device, a rockable platform and toggle mechanisms at the end of the platform adapted in unfolded position to give passage to a car and in folded position to provide car retaining stops, said toggle mechanisms being bodily movable in folded position to centre a car on the platform, and means for moving said toggle mechanisms.

4. In a car unloading device, a rockable platform, a carriage at each end thereof movable longitudinally of the platform and having guides therein, a toggle mechanism mounted in each carriage, one end of each toggle mechanism being pivoted at a fixed point and the other end being pivotally and slidably mounted in the guides of the carriage, stops carried by the platform adapted to engage the slidable end of each toggle to hold the same for a predetermined period against movement by the carriage, said guides being formed to permit disengagement of the toggles when fully folded from said stops, whereby the toggle may move bodily with the carriage without further folding, and means for moving said carriages.

5. In a car unloading device, a rockable platform, a carriage on each end of said platform movable longitudinally thereof, a toggle mechanism in each carriage pivotally connected at one end to a fixed point of the carriage and pivotally and slidably connected at the opposite end of the carriage, stops mounted on the platform and adapted to engage the slidable ends of the folded toggles to stop movement thereof relatively to the carriage, whereby the toggles may be straightened out, and means for moving said carriages.

6. In combination with a car unloading device according to claim 4, a second set of stops mounted on the platform in the path of the slidable ends of the toggles when the same are fully folded and adapted to arrest movement thereof, whereby on continued movement of the carriages the toggles will be straightened out.

7. In a car unloading device, a tiltable platform and a car holding and centering mechanism mounted thereon including a carriage at each end of the platform movable in the longitudinal direction thereof, a toggle mechanism mounted in each carriage adapted in their folded position to engage a

car on the platform and in their unfolded position to disengage and give passage to a car, and stops mounted on the platform to engage said toggles and effect the folding and unfolding thereof upon movement of the carriages, and means for moving said carriages.

8. In a car unloading device, a rockable platform, a car holding and centering means thereon comprising a carriage at each end of the platform movable in the longitudinal direction of the car thereof, a toggle mechanism in each end of the carriage engaged in its foldable position with a car, stops on the platform adapted to control the folding and unfolding of the toggles, and guides on the carriages arranged to direct the toggles into and out of engagement with said stops, and means for moving said carriages.

9. In a car unloading device, a rockable platform, and car holding and centering means thereon comprising a carriage at each end of the platform movable in the longitudinal direction thereof, a toggle in each carriage pivotally connected at its ends to the carriage and slidable with relation to the carriage at one end, a platform-carried stop engageable by the slidable end of said toggle and adapted to arrest motion of the toggle end relatively to the carriage, whereby continued movement of the other end of the toggle by the carriage will effect folding of the toggle, and a guide on the carriage holding the slidable toggle end in engagement with said stop during folding, said guide being formed to permit disengagement of the slidable toggle end from the stop when the toggle is fully folded, whereby the toggle may be moved bodily in folded position with the carriage, the guide being formed to hold the toggle in folded position after disengagement from the stop, and means for moving said carriages.

10. In a car unloading device, a rockable platform, and a car holding and centering device thereon comprising a carriage at each end of the platform slidable in the longitudinal direction thereof, toggle mechanism in each carriage pivotally connected at its ends to the carriage and slidable at one end relatively to the carriage, a guide on the carriage engaging said slidable toggle end and having a portion holding said toggle in folded position, and a platform-carried stop in the path of the slidable toggle end, when engaged in the holding portion of the carriage guide, adapted to disengage the toggle from the holding portion of the guide for straightening out the toggle upon further carriage movement, and means for moving said carriages.

11. In a car unloading device, a rockable platform, a car holding and centering device thereon comprising at each end of the platform a carriage movable in the longitudinal direction of the platform, a toggle in the carriage arranged to engage a car when in folded position, said toggle being pivotally connected at its ends to the carriage and slidable relatively to the carriage at one end, a platform-carried stop disposed in the path of the slidable toggle end and adapted to arrest movement thereof, whereby on continued carriage movement the toggle will be folded up, a guide on the carriage holding said slidable toggle end in engagement with the stop, said guide having a portion adapted to receive the toggle end and hold the toggle in folded position to permit disengagement of the toggle end, a stop whereby the toggle may be moved bodily in folded position by the carriage to position a car on the platform, a second platform-carried stop in the path of the toggle end upon reverse movement of the carriage, said stop being adapted to disengage the toggle end from the holding portion of the guide, whereby said toggle will straighten out upon reverse movement of the carriage, and means for simultaneously moving said carriages toward and away from the centre of the platform.

12. In a car unloading device, a rockable platform, a car holding and centering device including a carriage on each end of the platform movable in the longitudinal direction thereof, a buffer mechanism on each carriage comprising a pair of bars pivoted together at one end and equipped with a car-engaging stop, means pivotally and slidably connecting the remaining ends of said bars with the carriage, means for simultaneously moving said carriages toward and away from the central portion of the platform, and means cooperating with each carriage to raise the bars thereon to a vertical position when the carriage is moved toward the central portion of the platform and to effect collapsing of said bars when the carriage is moved toward the end of the platform.

13. An arrangement according to claim 12 in which the last mentioned means comprises a pair of stops arranged to alternately cooperate with the carriage end of one of said bars during movement of the carriage toward and away from the center of the platform.

14. In a car unloading device, a platform, a carriage movable on the platform having a slot therein deepened at the outer end, toggle mechanism pivotally connected at its ends to the carriage and slidably engaged at its inner end in said slot, a platform-carried stop adapted to arrest movement of the slidable end of the toggle during movement of the carriage in one direction, whereby the toggle end will move relatively in the slot, said stop being inclined to depress the toggle end into the deepened portion of the

slot, whereby the toggle end will be disengaged from the slot and held against movement relatively to the carriage, and a second platform-carried stop positioned to engage the slidable end of the toggle on movement of the carriage in the opposite direction, said stop being inclined to lift the toggle end out of the deepened portion of the carriage slot, whereby the toggle end may move relatively to the carriage to effect unfolding of the toggle.

15. In a car unloading device, a rockable platform, a carriage at each end of the platform movable in the longitudinal direction thereof, running wheels at the ends of said carriages supporting the same on the platform, an axle connecting opposite wheels adjacent the outer end of each carriage, a car buffer and centering device on each carriage comprising a member pivotally connected at one end to the axle and adapted at the opposite end to engage the coupler of a car on the platform, an operating link pivotally connected at one end to said member adjacent the buffer and pivotally and slidably connected at its opposite end to the carriage, and a bridle connected to the last mentioned end of said link extending under the platform and holding the buffer member and carriage against upward movement by pressure of a car against the buffer.

16. In combination with a device according to claim 15, a nut rigidly mounted in each carriage, a worm shaft revolubly journalled in the platform and operatively connected with said carriage, a motor and a releasable connection between the motor and shaft.

17. In combination with a device according to claim 15, platform tilting means, a motor, releasable operative connection between the motor and carriages, and releasable operative connection between the motor and platform tilting means.

18. In a car unloading device, a hingedly mounted deflecting plate, means for forcing said plate across a car at an angle to the transverse plane thereof, means for longitudinally tilting the car, whereby the contents thereof in the elevated end will slide against the deflecting plate and be thereby laterally directed out of the car, said means being operable to subsequently elevate the opposite end of the car, whereby the contents thereof will move the deflecting plate to give egress from the car.

19. In a car unloading device, means for elevating the ends of a car successively, a deflecting plate adapted to span a car and to deflect the contents sliding from the elevated end in a lateral direction to a side door, and means for introducing said deflecting plate and for supporting the same in operative position.

20. In a car unloading device, means for operating the car to elevate the ends thereof successively, a deflecting plate adapted to span a car and to deflect the car contents sliding from the elevated end laterally through a side door, means for introducing said deflecting plate through the doorway of a car and for hingedly supporting the plate adjacent the opposite doorway whereby said plate may assume an angular position relatively to the axis of the car to deflect the car contents laterally and means carried by the deflecting plate inserting mechanism for swinging one end of an inner or grain door inwardly and for forcing the opposite end of a door from a car, whereby said door is liberated for escape with the contents of the car.

21. In a car unloading device, a deflecting plate, means hingedly related to the plate for forcing the same across a car, said plate being adapted for support at one edge by the forcing means and at the opposite edge by the side of a car doorway, and means for positioning a car with one side of its doorway approximately in alignment with the forcing means, whereby said plate may swing from side to side of the doorway.

22. A device according to claim 21, in which the forcing means is adapted to move angularly across a car and to support the deflecting plate at the free side of the car at the vertical centre of the door.

23. In a car unloading device, a car support, a deflecting plate support on the car support, a deflecting plate hingedly mounted on this support, means for positioning and holding a car with one side of a doorway substantially opposite said plate support.

24. In combination with a device according to claim 23, means in the plate support for forcing the deflecting plate in an angular direction across a car.

25. In combination with a device according to claim 23, means for forcing the deflecting plate across a car from one side of the doorway adjacent the plate support to approximately the centre of the doorway at the opposite side of the car, and means for tilting the car supports to elevate the car ends successively, whereby the car contents will slide from the ends of the car against said deflecting plate.

26. A device according to claim 23, in which the car support is arranged to support a car in laterally inclined position and in which the plate support is laterally inclined.

27. In a car unloading device, means to support a car in laterally inclined position, a column rising from said means, bars slidably mounted in said column parallel with the floor of a car on said support, means connecting the bars, a deflecting plate hingedly connected to said connecting means, and

means mounted on the column for reciprocating said bars to carry the deflecting plate back and forth across a car.

28. A device according to claim 27, in which the bars are disposed at an angle to the longitudinal centre line of a car in combination with means for positioning and holding a car with one side of its doorway adjacent said column and bars.

29. A device according to claim 27, in which the bars are arranged at such angle to the vertical plane of a car that the connecting member entering at one side of one doorway will strike the centre of the opposite doorway.

30. A device according to claim 27, in which the deflecting plate has limited vertical movement relatively to the connecting member.

31. A device according to claim 27, in which the edge of the connecting member adjacent the car is toothed to grip and transport the grain door of a car.

32. In combination with a device according to claim 27, a flexible member connected to the hinged edge of the deflecting plate and projecting in advance of the connecting member to make a grain-tight joint with the grain door of a car.

33. A device according to claim 27, in which the edge of the connecting member is inclined at the top toward the plate of a grain door, whereby on the advance of said member the grain door will be separated from the car carrying it from the top downwardly.

34. In a car unloading device, a car support, a column carried by the support, a pair of rack bars disposed in parallelism to one another and transversely of the support, pinions journalled in the column meshing with said rack bars, guide rolls on the columns guiding said bars and holding the same in mesh with the pinions, and reversible driving means for said pinions mounted on the columns.

35. In a car unloading device, a car support, a column carried by the support, a pair of rack bars disposed in parallelism to one another and transversely of the support, pinions journaled in the column meshing with said rack bars, guide rolls on the columns guiding said bars and holding the same in mesh with the pinions and reversible driving means for said pinions mounted on said columns and including a shaft, worms thereon and worm wheels meshing with said worms and operatively connected to the pinions.

36. In a car unloading device, means for forcing one end of a grain door inwardly against the outer pressure of grain behind it, and a deflecting plate connected to said door forcing means and adapted to rest against the opposite side of the car doorway from that at which the grain door is being forced inwardly, said door forcing means being adapted to dispose a deflecting plate angularly across a car.

37. In combination with a device according to claim 36, a car support and means for elevating the end of said support and the car thereon adjacent the inwardly forced grain door end, whereby grain will slide from the elevated end of the car onto said plate and be deflected laterally thereby out of the car.

38. In combination with a device according to claim 36, a car support and means for automatically positioning a car thereon with one side of a doorway thereof adjacent the grain door forcing means.

39. In a car unloading device, means for forcing the grain door of a car inwardly against the outward pressure of grain in the car, said means being movable across the car to a position at substantially the centre of the car doorway, a deflecting plate hingedly connected at one end to said forcing means and adapted at the other end to swing between the sides of the doorway through which it is introduced, and means for successively elevating the ends of a car, whereby grain will slide from the car ends against said plate and be laterally directed thereby out of the car.

40. A device according to claim 39, in which the means for successively elevating the car ends includes a car support, means for rocking said support and means for positioning and holding a car thereon in predetermined relation to the door forcing means.

In witness whereof, I have hereunto set my hand.

FREDERICK W. COWIE.