

No. 791,092.

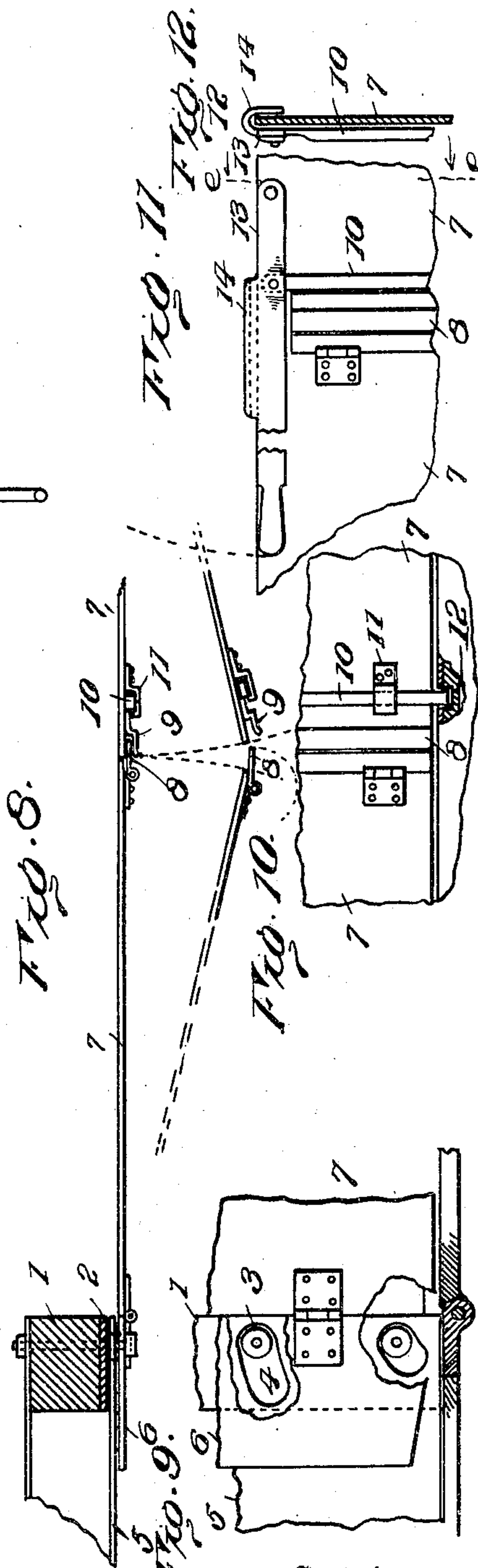
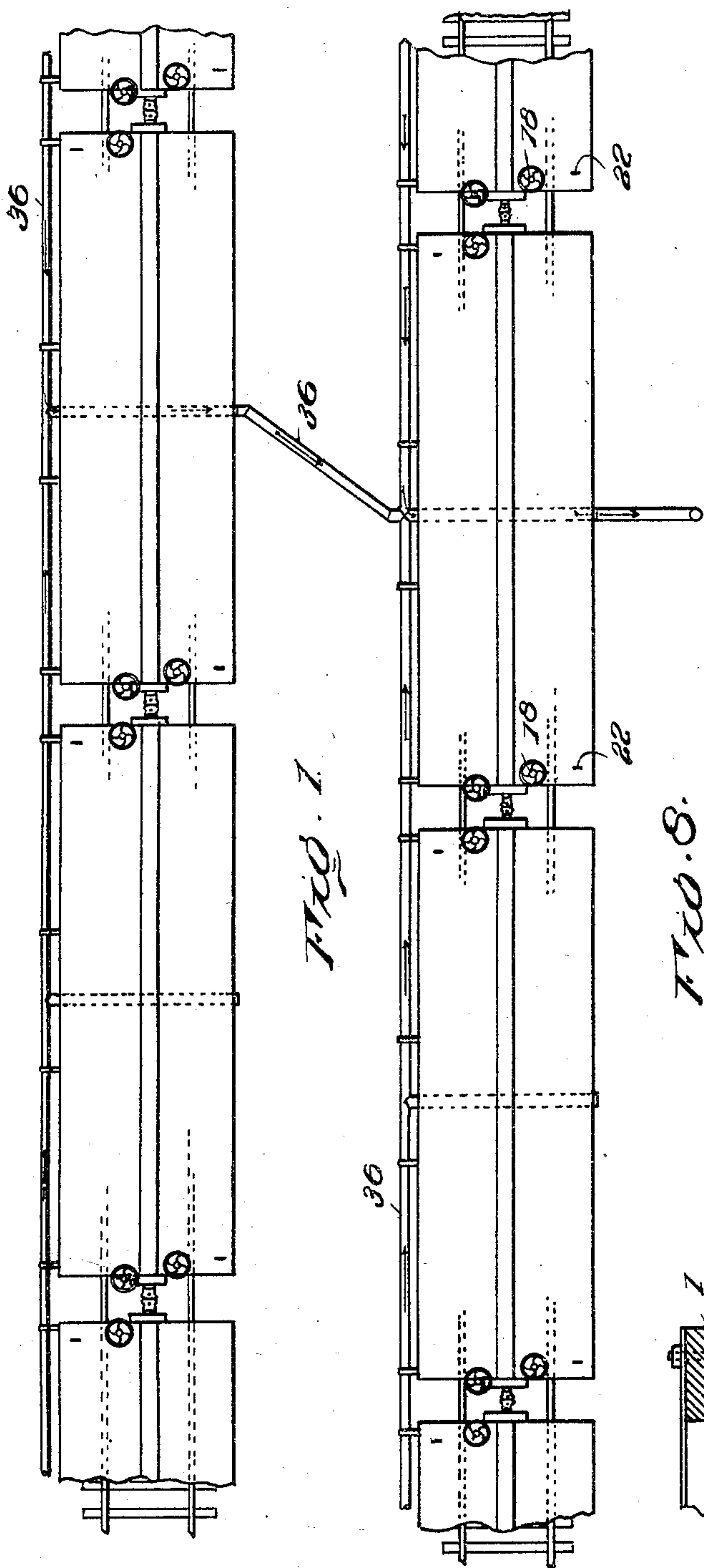
PATENTED MAY 30, 1905.

E. B. GILLELAND & U. G. CHARLES.

GRAIN CAR.

APPLICATION FILED SEPT. 6, 1904.

3 SHEETS—SHEET 1.



Witnesses

J. M. M. H. H. H.
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3 SHEETS—SHEET 2.

FIG. 3.

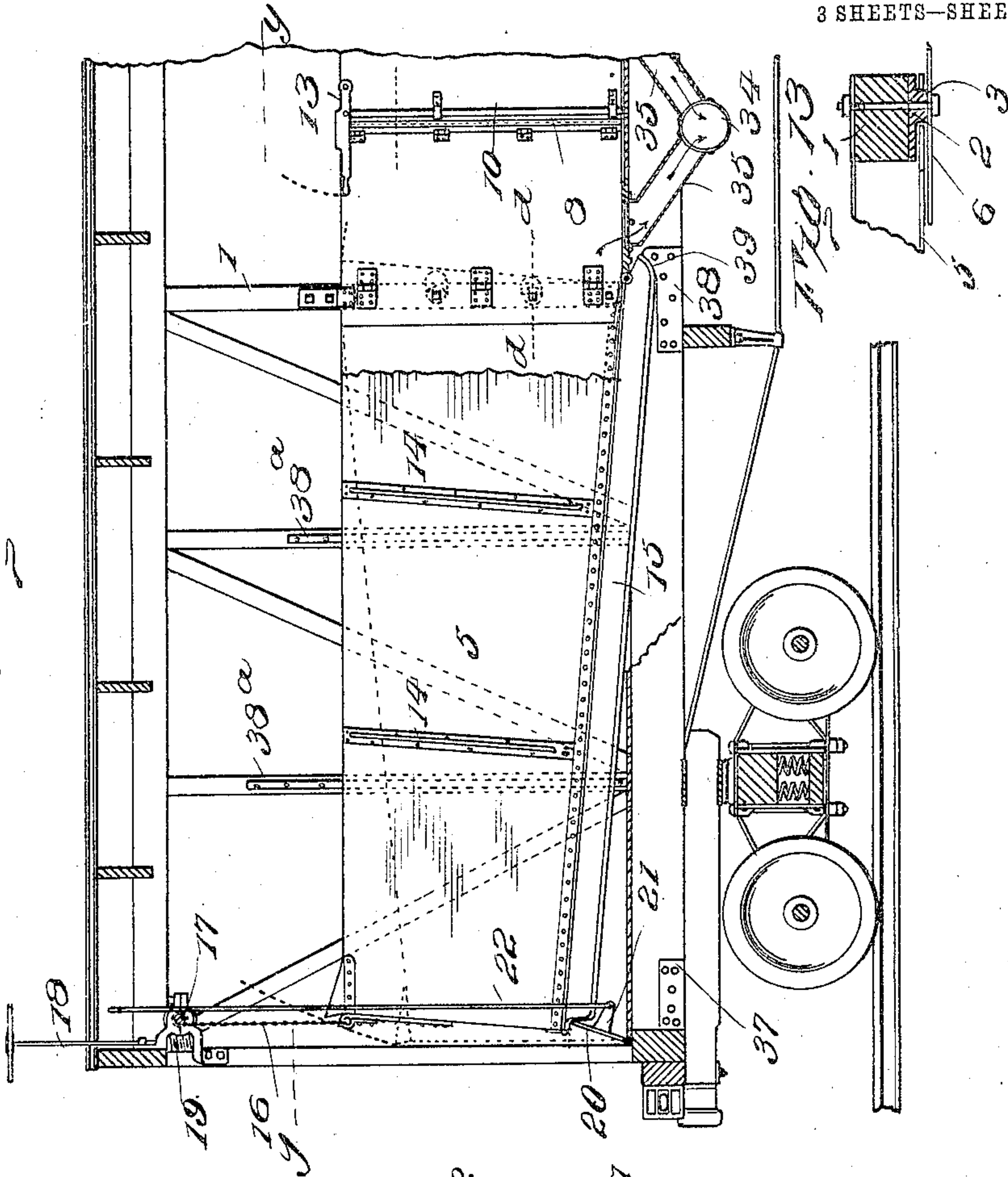
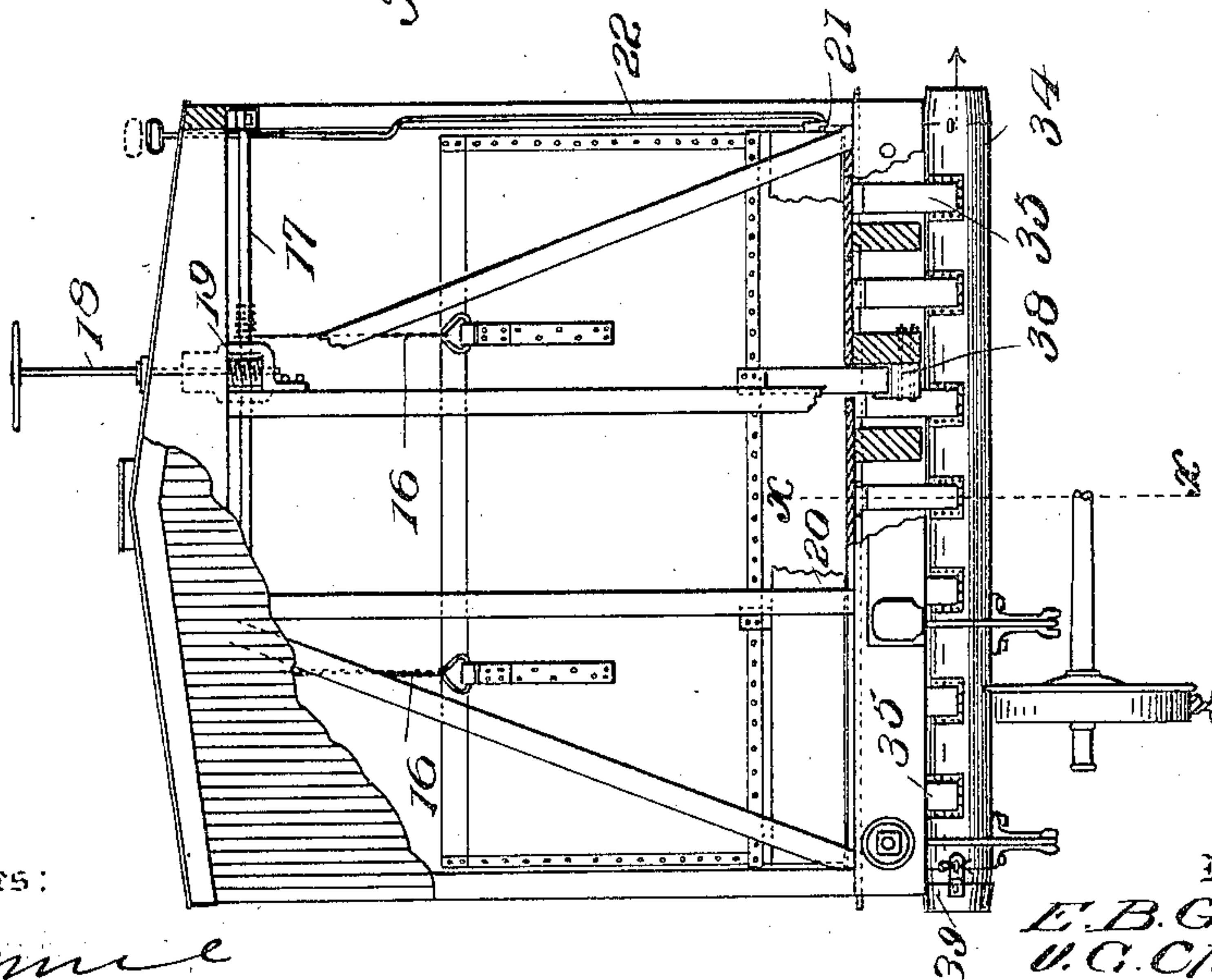


FIG. 2.



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3 SHEETS—SHEET 3.

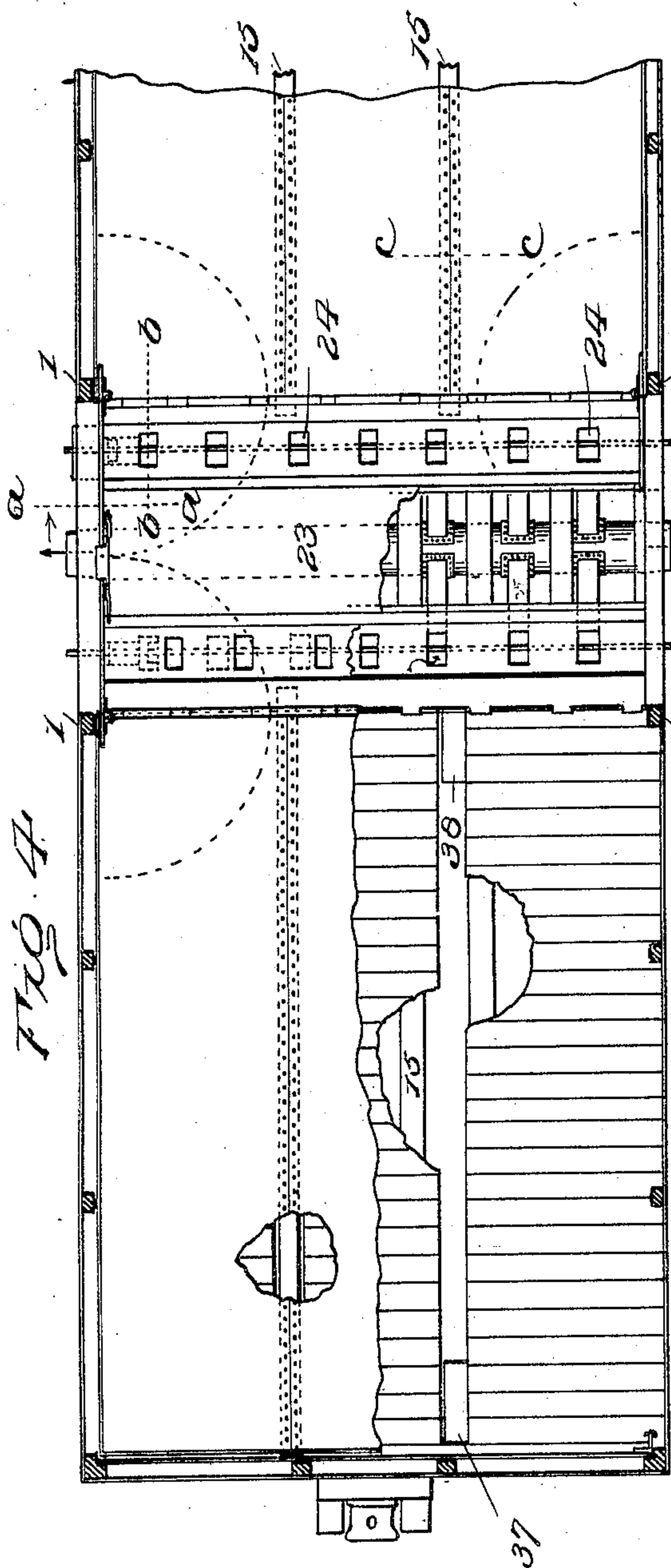


FIG. 5.

FIG. 6.

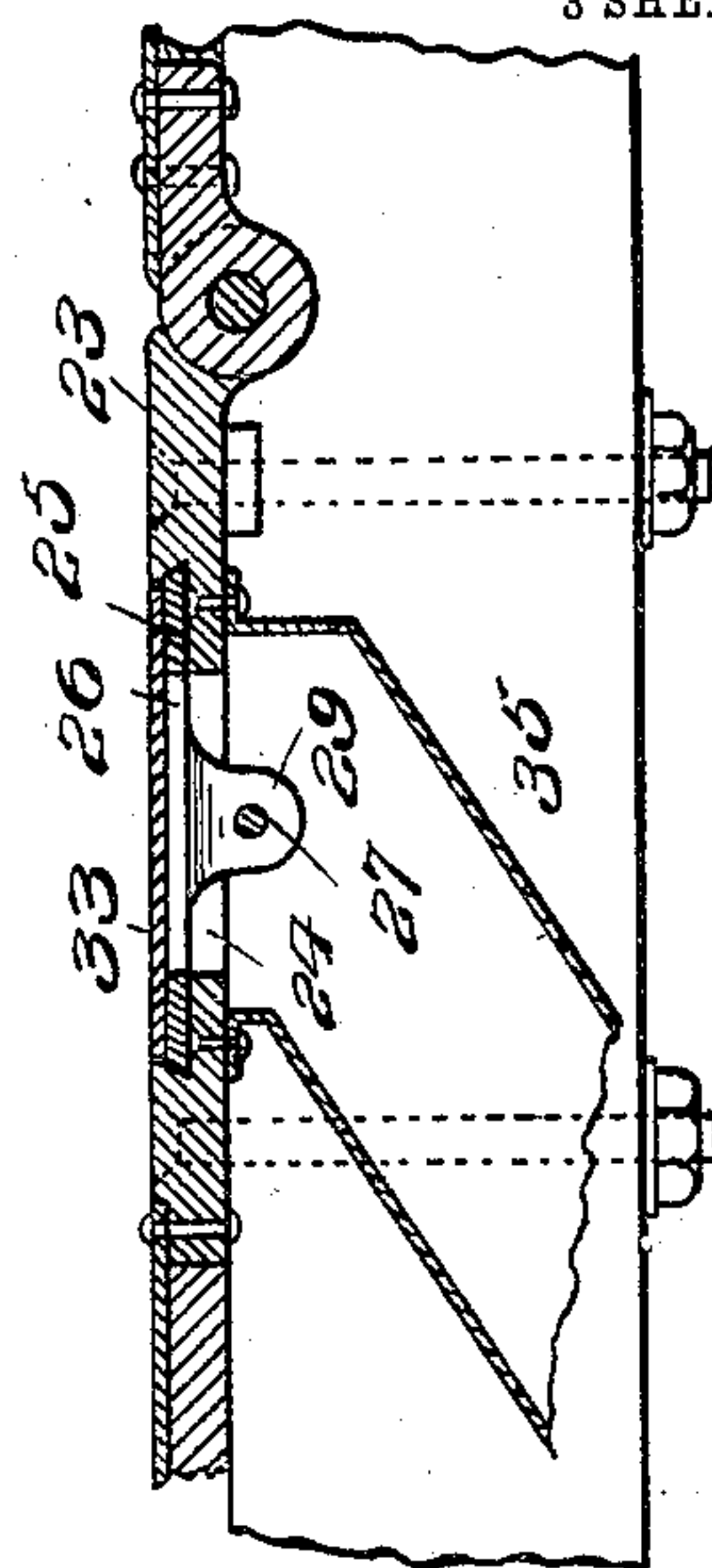
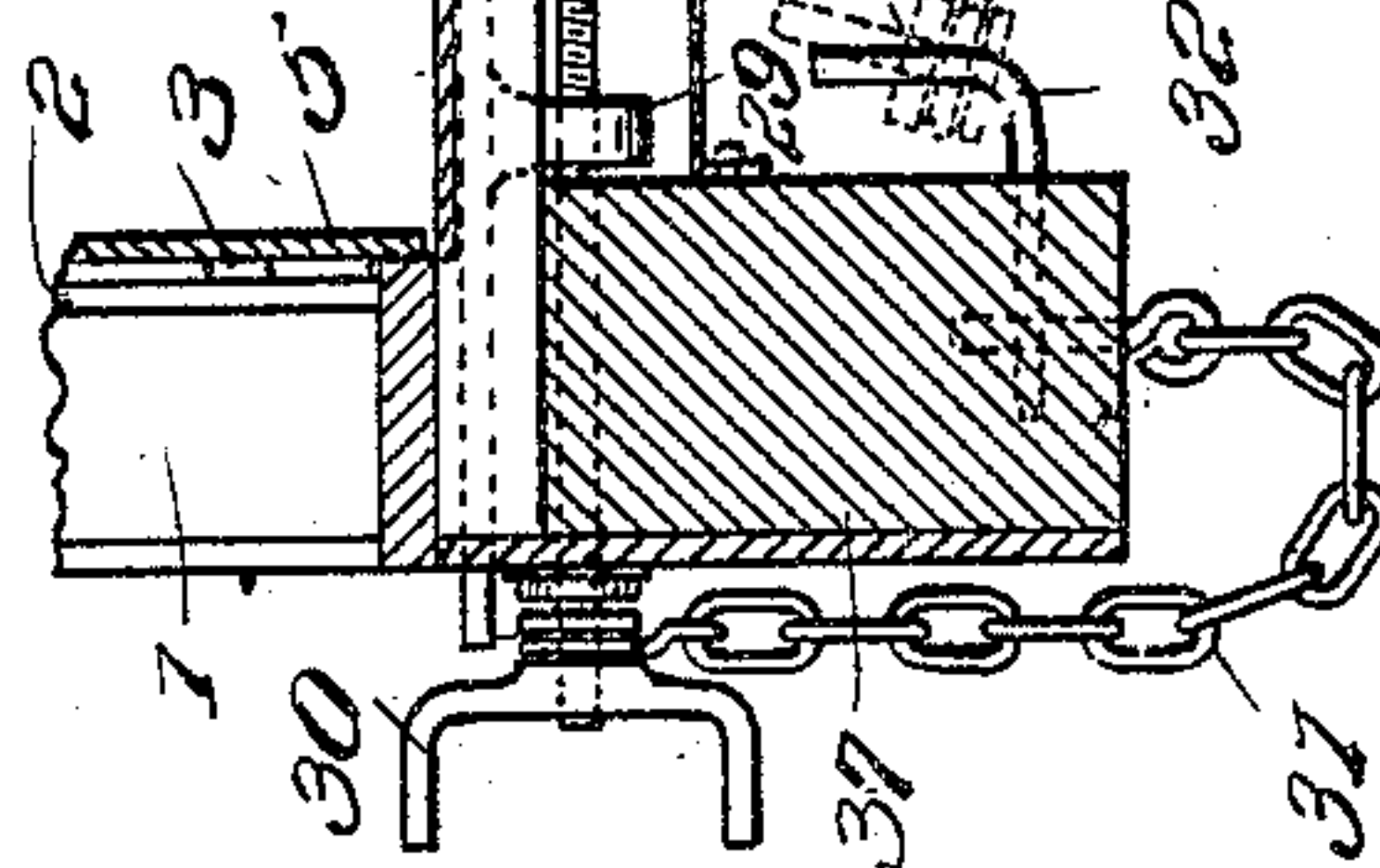
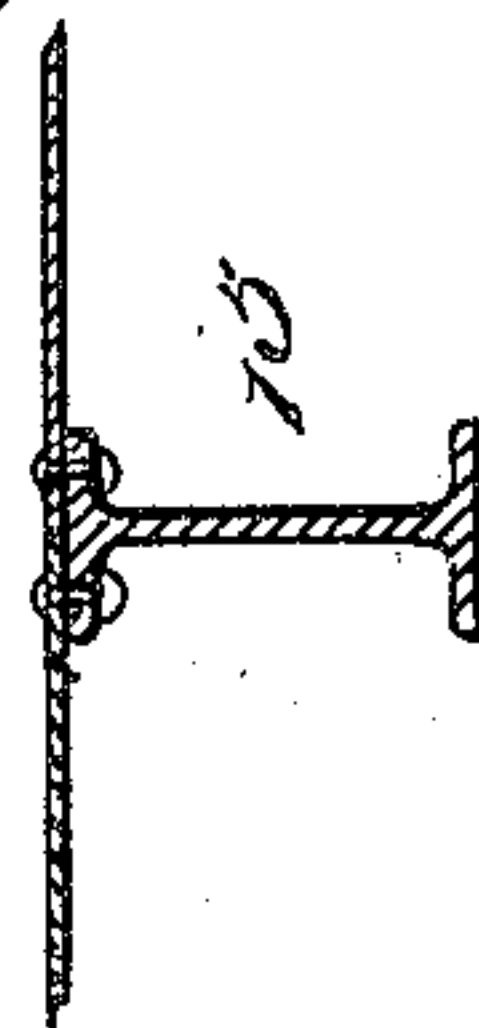


FIG. 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDGAR BERESFORD GILLELAND AND ULYSSES G. CHARLES, OF WICHITA,
KANSAS.

GRAIN-CAR.

SPECIFICATION forming part of Letters Patent No. 791,092, dated May 30, 1905.

Application filed September 6, 1904. Serial No. 223,526.

To all whom it may concern:

Be it known that we, EDGAR BERESFORD GILLELAND and ULYSSES G. CHARLES, citizens of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Grain-Cars, of which the following is a specification.

In the transportation of grain and like commodity, which is generally shipped in bulk in a loose state, a very considerable expense is entailed in the unloading, particularly when cars are employed as the carrier means.

This invention has for its object to devise a construction of car which will greatly facilitate the unloading and greatly reduce the expense and enable the operation to be completed in less time than is possible with the cars as generally constructed and in service.

This invention enables a train of cars to be unloaded without requiring the shifting of a train after each car is emptied. Hence it is not necessary to keep an engine in waiting to move the cars. Moreover, any car of a train may be unloaded at will, or the cars of trains on adjacent tracks may be emptied either simultaneously or in rotation.

The invention consists of a box within the car mounted for tilting movement, means for raising and lowering the box at one end, an outlet at the pivotal end of the box, controlling means for opening and closing said outlet, a conveyer for connecting the outlets of the several cars of a train in series, the doors by means of which access to the box is had, and the connections between the doors, car, and box for maintaining a tight joint at all positions of the box.

The invention also consists of the novel features, structural details, and combinations of parts, which hereinafter will be more particularly set forth, illustrated, and finally embodied in the subjoined claims.

In the accompanying drawings, forming a part of the specification, Figure 1 is a top plan view of a portion of two trains on adjacent tracks, showing the cars thereof connected in accordance with this invention to facilitate their unloading. Fig. 2 is an end view of a car

embodying the invention, parts being broken away to illustrate more clearly the relative arrangement of the cooperating elements. Fig. 3 is a longitudinal section of the end portion of a car embodying the invention on the line *x x* of Fig. 2, the box being in full lines and having an end portion of the near side broken away to disclose a side door. Fig. 4 is a plan section of the car on the line *y y* of Fig. 3, parts being broken away. Fig. 5 is a transverse section of a side portion of the car on the line *a a* of Fig. 4 looking in the direction of the arrows, the parts being on a larger scale. Fig. 6 is a detail longitudinal section of a portion of the car on the line *b b* of Fig. 4. Fig. 7 is a detail section of the bottom portion of the box on the line *c c* of Fig. 4. Fig. 8 is a plan section of a side portion of the car, showing more clearly the joint formed between cooperating doors and the joint formed between a door-post, a door, and the box, the dotted lines indicating the position of the doors when swung inward. Fig. 9 is a detail view in elevation showing the bottom portion of the box at the hinged joint and a portion of the door, door-post, plate, and side of the box adjacent the said hinged joint. Fig. 10 is a detail view in elevation of the lower corner portions of cooperating doors. Fig. 11 is a detail view of the upper corner portions of cooperating doors, showing the securing means therefor. Fig. 12 is a section on the line *e e* of the parts illustrated in Fig. 11 looking in the direction of the arrows. Fig. 13 is a section on the line *d d* of Fig. 3, showing the parts on a larger scale.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The car illustrated is of the box type, such as is commonly employed in the haulage of freight. Ingress and egress are effected by means of a door opening in each side of the car medial of its ends in the accustomed way. The door-post is indicated at 1 and is provided upon the side facing inward with a plate 2, from which studs 3 project to pass through

openings 4, formed in a side of the box 5, arranged with an end portion of the car. A plate 6 is bolted or otherwise secured to the door-post 1, the studs 3 serving to space the plate 6 from the plate 2 a distance to snugly receive a side of the box 5 without binding same. The door 7 is hinged to the plate 6 and is adapted to swing inward, as indicated by the dotted lines in Fig. 8. A pair of doors 7 are provided for each opening, and each is similarly hinged to its respective door-post. When the doors are closed, their meeting ends abut. However, to insure the formation of a tight joint to prevent escape of grain or other commodity a leaf 8 is hinged to an end portion of one of the doors and is arranged to overlap the end portions of both doors when closed, the free edge of the leaf 8 being retained in place by one or more keepers 9, applied to an end portion of the opposite door. A bar 10, vertically slidable in keepers 11, attached to the door 7, provided with the keeper 9, is adapted to have its lower end enter an opening 12 in the bottom of the car, so as to secure the doors when closed. The upper end of the bar 10 is pivotally connected to a lever 13, pivoted at one end to the door carrying the bar 10 and provided with a recurved flange 14 along its upper end to embrace the edge portions of the doors at each side of the joint, thereby supplementing the action of the bar 10 in securing the doors when closed. When the lever 13 is moved upward at its free end, as indicated by the dotted lines in Figs. 3 and 11, the doors are liberated and may be swung inward.

A box is arranged within each end portion of a car and is hingedly or pivotally connected at its inner lower end to the bottom of the car, so as to admit of its outer end being elevated when required to incline the bottom of the box toward the outlet or discharge, thereby greatly facilitating the unloading of the grain or other commodity shipped in bulk in the loose state. The box is preferably constructed of plate metal and is stiffened and reinforced at its bottom and sides by means of beams riveted or otherwise secured thereto. The side beams are indicated at 14, and the bottom beams at 15. The bottom reinforcements preferably consist of I-beams, as shown most clearly in Fig. 7, although any form of beam may be employed. The box may be of any substantial construction and is mounted so as to tilt upon one of its lower corners corresponding to the discharge and to be raised and lowered at its opposite end. For convenience and economy of construction the boxes of a car are mounted so as to raise and lower at their outer ends, thereby enabling the discharge to be at a central point and common to each. Any suitable means may be employed for raising and lowering the box at its movable end, and for convenience chains or cables 16 are employed and are connected at

their lower ends to the box and at their upper ends to a transverse shaft 17, journaled near the top of the car and rotated by means of a shaft 18 and worm-gearing 19. The shaft 18 extends above the top of the car and is provided with a hand-wheel to admit of convenient operation of the shaft when turning the transverse shaft 17 either to wind or unwind the chains 16 according as the box is either to be raised or lowered. A support 20, pivotally connected at its lower edge to the bottom of the car, is adapted to be moved so as to engage under the elevated end of the box and hold the same when raised, thereby relieving the chains or cables 16 of all strain after they have performed their office of raising the box. An arm 21 projects from an end portion of the support 20, and an operating-rod 22 is connected thereto and extends above the roof of the car, as indicated most clearly in Fig. 2, to be conveniently gripped when it is required to operate the support 20. In its simplest form the support 20 consists of a plate, although it may be provided in any shape so long as it enables the desired result to be effected.

Each box of a car is approximately of a length corresponding to the distance from an end of the car to the near side of the doorway. The bottom of the box is hinged to the bottom of the car opposite the doorways in a manner to maintain a close joint, so as to prevent any waste of grain or other commodity stored in the car for shipment. The part of the car-bottom opposite the doorways is designated by the reference-numeral 23 and is formed near opposite edges with a series of openings 24, which constitute the outlet or discharge. A plate 25 is mounted in a recess of the part 23 for longitudinal movement and is provided with openings 26, corresponding in number and position with the openings 24. In one position of the plate 25 the openings 24 and 26 register, and in another position of said plate the openings 24 and 26 are out of register, thereby shutting off the discharge or outlet. The plate 25 constitutes a cut-off and may be operated by suitable means. As indicated most clearly in Fig. 5, a rod 27 extends transversely of the car immediately below the plate or cut-off 25, and a portion near one end is threaded, as shown at 28, and coöperates with a lug 29, pendent from the plate 25. The rod 27 is mounted in suitable bearings, so as to rotate freely, but is prevented from any longitudinal play. Obviously rotation of the rod 27 in one direction or the other will effect a corresponding movement of the plate or cut-off 25. To enable easy operation of the rod 27, a handpiece 30 is provided and is of U form and is adapted to be fitted to the projecting end of the rod 27, a short chain or like connection 31 being attached at one end to the handpiece and at its opposite end to the car, thereby preventing loss or accidental

displacement of said handpiece. A hook 32, conveniently positioned, is adapted to support the handpiece 30 when disconnected from the rod 27, as indicated by the dotted lines in Fig. 5. When a car equipped with the invention is designed for hauling freight other than grain or other commodity in loose form, the outlet or discharge may be protected by means of a covering-plate 33, which is arranged to extend over the plate or cut-off 25, thereby preventing any possible injury thereto.

Each car is provided with a transversely-arranged conductor 34, which preferably consists of a pipe and is common to the outlet or discharge of each box. The conductor 34 is located at a medial point and below the part 23 of the car-bottom and is connected by pipes 35 with the several openings 24, said pipes being upwardly diverged. The end portions of the conductor 34 project a short distance beyond the sides of the car for convenience of attachment thereto of the conveyer-pipe 36, by means of which the cars of a train are unloaded in series and the others on adjacent tracks connected for unloading, as indicated most clearly in Fig. 1. The outermost pipe in proximal relation to the longitudinal sill of the car upon which the end portion of the plate 25, having the lug 29, borders is cut away and a housing 36 projects horizontally therefrom toward the sill 37 of the car and is attached thereto. This housing 36 receives the grain or other commodity falling through the opening in the bottom of the car through which the lug 29 projects and directs said commodity into the pipe. This arrangement prevents the waste which would otherwise occur.

The edge portions of the sides of the box being confined between the plates 2 and 6 in the manner stated, no appreciable space exists for the escape of the load, while at the same time provision is had for free vertical movement of the box at its outer end. The bottom of the car is slotted at points corresponding to the beams 15, thereby admitting of said box resting securely upon the bottom of the car and the beams 15 occupying a position below the bottom. Blocks 37 and 38 are bolted to side of longitudinal timbers to form supports for end portions of the beams 15 when the box is at its lowest position. The inner ends of the beams 15 are made rounding, as shown at 39, and are concentric with the axis about which the box tilts, and the inner end portion of each block 38 is extended and provided with a seat cooperating with the curved end 39, so as to relieve the strain upon the hinged connection of the box with the car when said box is tilted or raised.

To unload a train of cars, each car of which embodies the invention, it is necessary only to connect the cars after the train has arrived at its destination by means of the conveyer-pipe 36, the same being coupled to an end of

the conductor 34 and a branch of said pipe 36 being extended to the granary, elevator, or other place destined to receive the grain or other commodity from the cars. A blast of air is maintained in the conveyer-pipe 36 by means of a blower or other contrivance. (Not shown.) The suction thus created in the conveyer-pipe and conductor 34 results in delivery of the load to the required point of discharge, as will be readily comprehended. Any particular car of the train may be unloaded to the exclusion of the others by operating a cut-off 25 to effect registry of the openings 26 and 24, the discharge of the remaining cars being closed. When one car is emptied, its discharge may be closed and the discharge of another car opened, and so on throughout the cars of the train until all are unloaded. This precludes the necessity for shifting cars to bring each in a position opposite to the elevator and admits of the train being leisurely or expeditiously unloaded, as may be required. Cars on adjacent tracks may be conveniently unloaded, either separately or at the same time, by proper arrangement of the conveyer-pipes 36 and branches thereof. The tilting of the box insures discharge of the load by gravitative action and precludes the necessity of any one entering the car to dislodge the load. Wear-strips 38^a are attached to the inner faces of the uprights of the car-framing to resist the abrasive action of the box thereon incident to the raising and lowering of said box.

The conductor 34 is adapted to be closed at either or both ends by means of a cap 39, as shown most clearly in Fig. 2, which may be secured by means of a hasp and cotter or in any manner. When the conveyer-pipes or branches are attached to one side of a car, only, one end of the conductor is uncovered; but when connected to both sides both ends of the conductors have their caps or closures removed.

It is preferred to tilt the box preliminary to loading the car, so that the grain line or top of box may be level during transportation. This also avoids the great strain upon the parts incident to filling the box when loaded.

It is to be understood that the doors when opened may be secured in any well-known manner to prevent their casual movement.

Having thus described the invention, what is claimed as new is—

1. In combination, a closed car, a box for receiving the load arranged within said car and provided with a discharge at one end, means for raising and lowering said box at the opposite end, and other means for holding the box when elevated, substantially as set forth.

2. In combination a closed car, a box for receiving the load arranged within said car and provided with a discharge at one end, means for raising and lowering said box at the opposite end, a pivoted support interposed

between the car and box for holding the latter elevated, thereby relieving the hoisting means, and actuating means for said pivoted support to admit of throwing it into and out of operative position from a convenient point, substantially as set forth.

3. In combination, a closed car, a box for receiving the load arranged within said car and provided with a discharge at one end, means for raising and lowering said box at the opposite end, a support pivoted to the car and adapted to engage under the elevated end of the box and hold the same when raised, and actuating means for operating said pivoted support from a convenient point, substantially as set forth.

4. In combination, a car, a tilting box arranged within the car, longitudinal beams secured to the bottom of the box for stiffening and strengthening the same and having one end made rounded and concentric with the axis about which the box tilts, and a support receiving an end portion of the beams and having a curved side for cooperation with the rounded end of the beam to relieve the pivotal connection of the box of strain when tilting the box to effect discharge of the load, substantially as described.

5. In combination, a car, having slots in its bottom, a tilting box for receiving the load and normally adapted to rest upon the bottom of the car, longitudinal beams secured to the bottom of the box for reinforcing the same and adapted to pass through the slots of the car-bottom, and supports secured to longitudinal timbers of the car for receiving said beams, substantially as set forth.

6. In combination, a closed car having a door-opening in its side, a tilting box arranged within the car, a plate attached to the door-post and spaced therefrom to receive an edge portion of a side of the box, and a door hinged to said plate and closing the door-opening of the car, substantially as set forth.

7. In combination, a closed car having a door-opening in its side, a tilting box arranged within the car, a plate arranged upon an inner side of the door-post and provided with inwardly-extended lugs, a second plate secured to the first-mentioned plate and door-post and spaced therefrom by means of the said lugs, an edge portion of a side of the box operating in the space formed between the two plates, and a door hinged to said second plate and closing the door-opening of the car, substantially as set forth.

8. In combination, a closed car having a door-opening in its side, a tilting box arranged within the car, a plate attached to the door-post and provided with inwardly-extended lugs passed through corresponding openings formed in the edge portion of a side of the box, a second plate connected to the first-mentioned plate and door-post and spaced therefrom by means of said lugs and over-

lapping the edge portion of the side of the box having the openings and closing the latter, and a door hinged to said second plate and closing the door-opening of the car, substantially as specified.

9. In combination, a car provided with a door-opening, double doors for closing said door-opening, a leaf hinged to an end portion of one of the doors and adapted to overlap end portions of the two doors when closed, and a keeper fitted to the end portion of the other door for securing the free edge of the leaf when the doors are closed, substantially as set forth.

10. In combination a car provided with a door-opening, double doors for closing said opening, a lever pivoted to one of said doors and having a recurved edge portion to embrace an edge portion of both doors, substantially as set forth.

11. In combination, a car having a door-opening, a lever pivoted to one of the doors and having a recurved edge portion to embrace a part of both doors when closed, and a rod slidably fitted to the doors having the lever pivotally attached thereto and connected to said lever for actuation thereby, substantially as set forth.

12. In combination, a car having a discharge in its bottom, a transversely-arranged conductor in communication with the discharge and adapted to have a conveyer-pipe fitted to their end, and a cut-off intermediate of the discharge and conductor for controlling the outlet, substantially as set forth.

13. In combination a car provided in its bottom with a discharge, a cut-off for regulating said discharge, and a conductor in communication with the discharge and adapted to have a conveyer-pipe connected thereto, substantially as specified.

14. In combination, a car having a discharge in its bottom, a cut-off for said discharge having a pendent lug and a rod having a threaded portion cooperating with said lug and adapted to operate said cut-off, a handpiece to be fitted to said rod, a flexible connection between the handpiece and car, and a hook applied to the car for supporting said handpiece when not in use, substantially as specified.

15. In combination, a car having a plurality of openings in its bottom, constituting a discharge, a conductor arranged below the car, a series of pipes connecting the aforesaid openings with the conductor, a plate having openings corresponding in position and number with those provided in the bottom of the car, and means for moving said plate longitudinally to control the discharge, substantially as set forth.

16. In combination, a car having spaced discharges in its bottom, tilting boxes arranged in opposite end portions of the car and arranged to deliver the load through the respective discharges, a transverse conductor,

pipes connecting the respective discharges with said conductor, and a cut-off for each discharge, substantially as specified.

17. In combination, a grain-car provided
5 with spaced discharges in its bottom, tilting
boxes arranged in opposite end portions of
the car for receiving the load, means for raising
and lowering the outer ends of said boxes,
supports for sustaining the box when raised,
10 a conductor, pipes connecting the conductor

with each of the said discharges, and a cut-off
between the conductor and each discharge,
substantially as described.

In testimony whereof we affix our signatures
in presence of two witnesses.

EDGAR BERESFORD GILLELAND. [L. s.]

ULYSSES G. CHARLES. [L. s.]

Witnesses:

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WILLIAM KEITH.