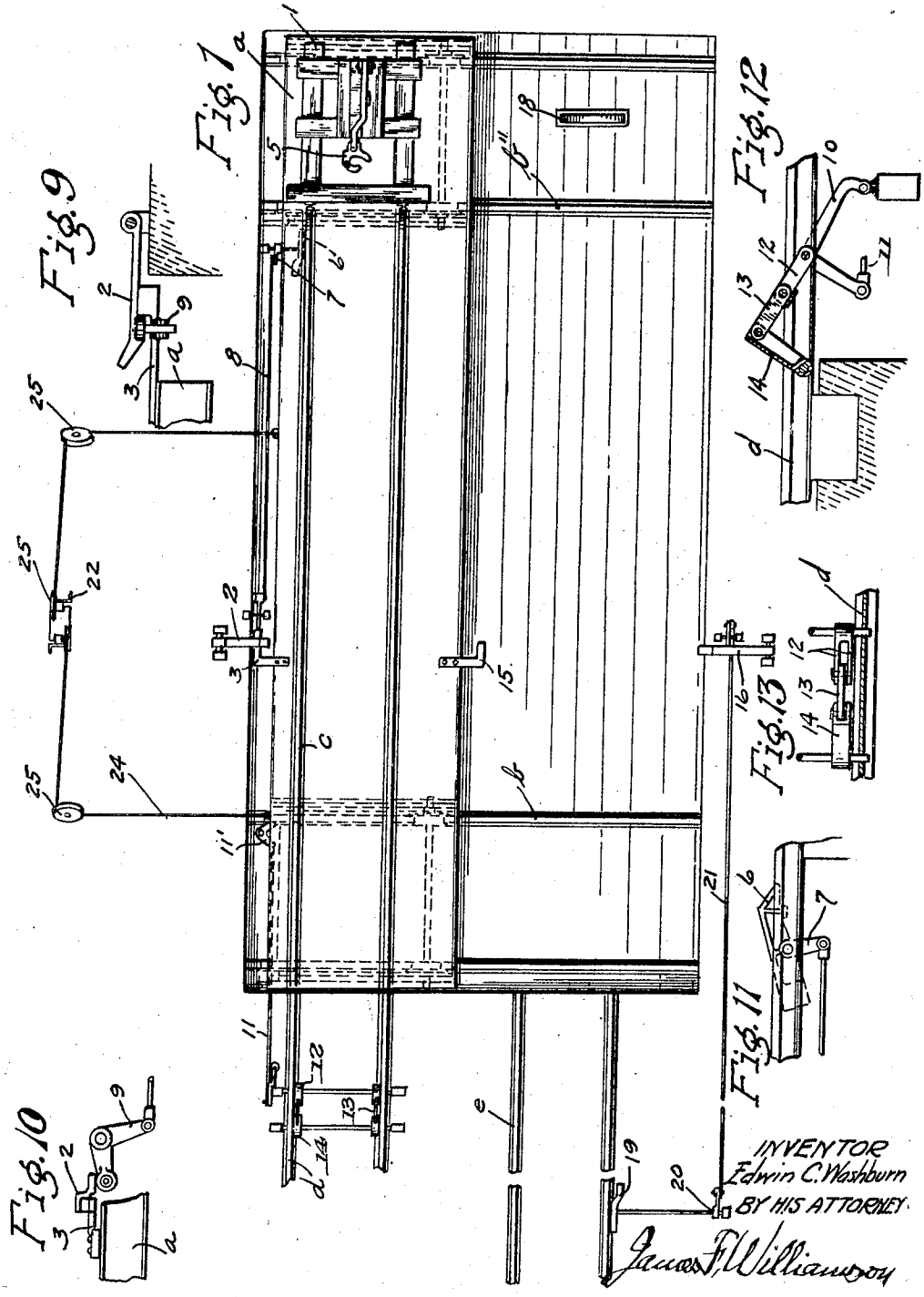
April 8, 1924. 1,489,404

E. C. WASHBURN

GRAVITY TRANSFER SYSTEM

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E. C. WASHBURN

GRAVITY TRANSFER SYSTEM

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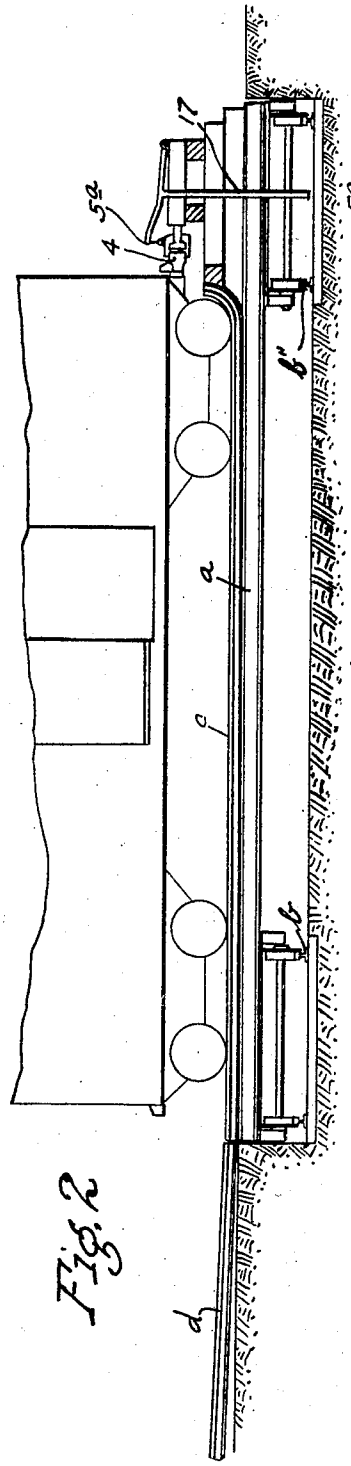


Fig. 2

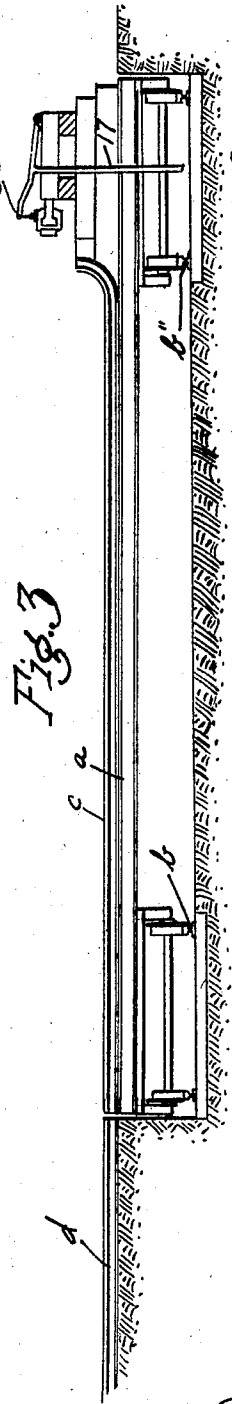


Fig. 3

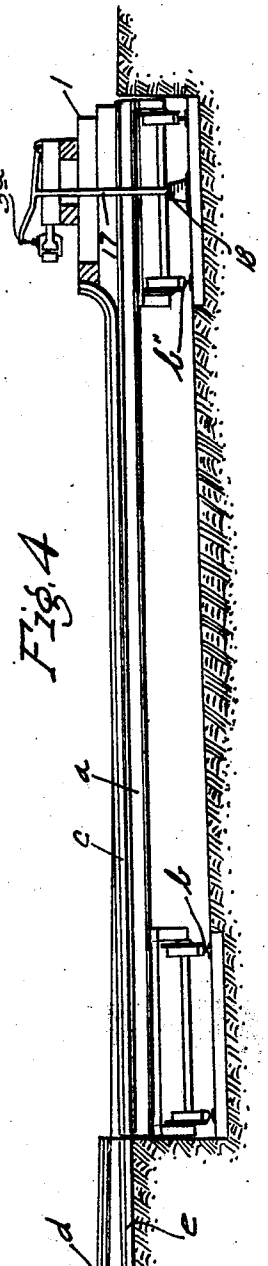


Fig. 4

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Fig. 5

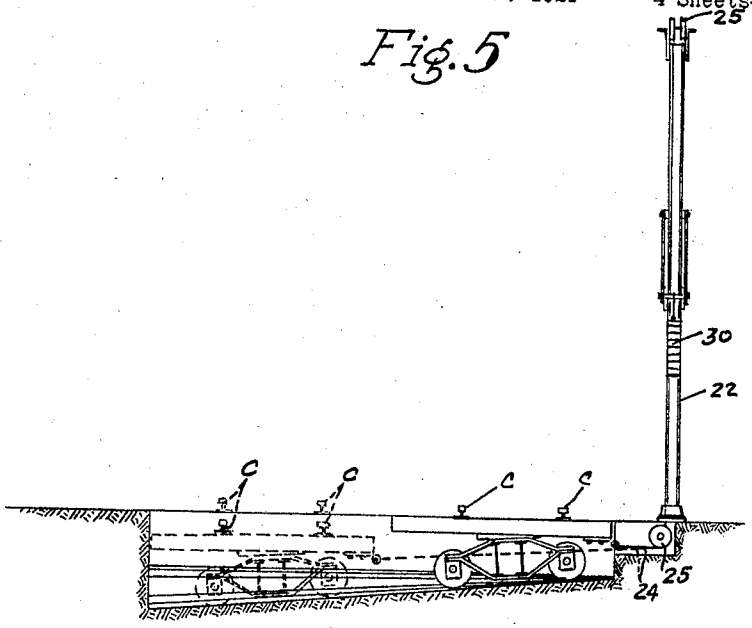


Fig. 7

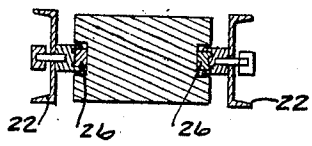


Fig. 6

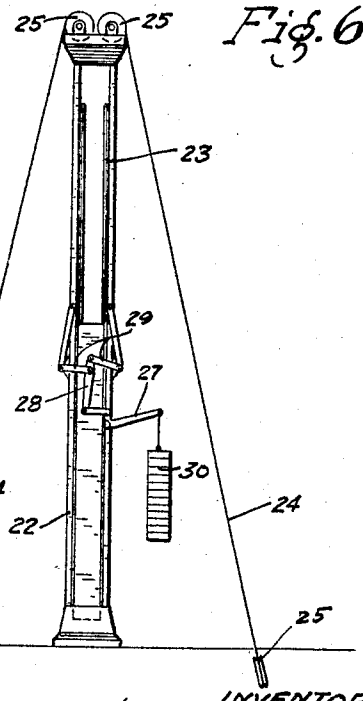
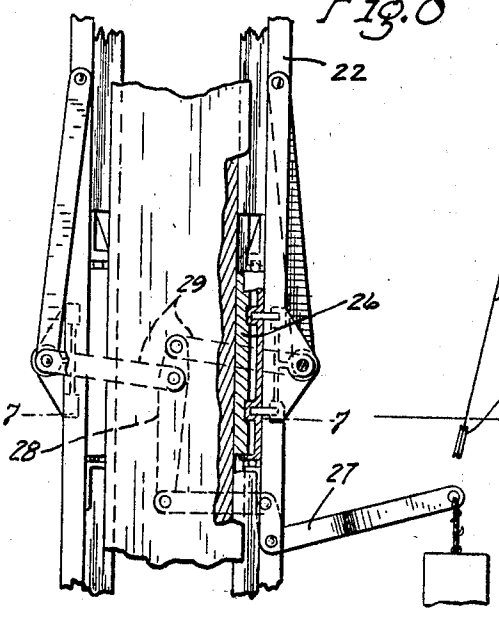


Fig. 8



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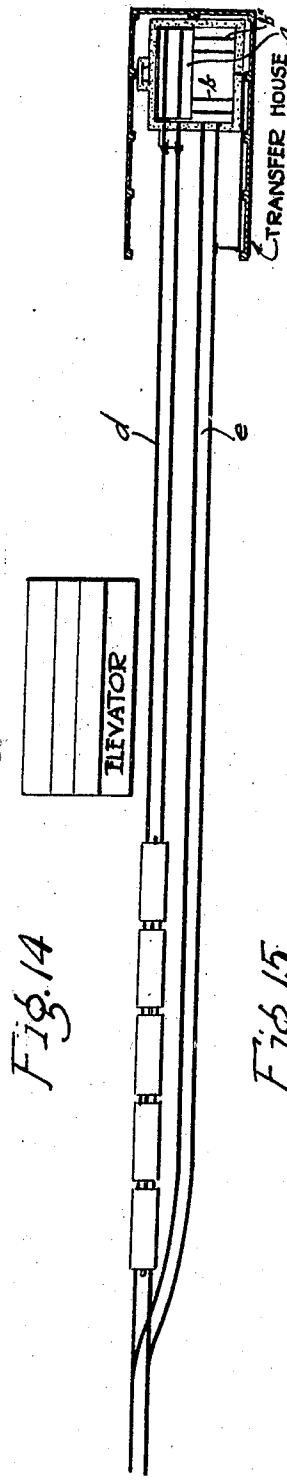


Fig. 14

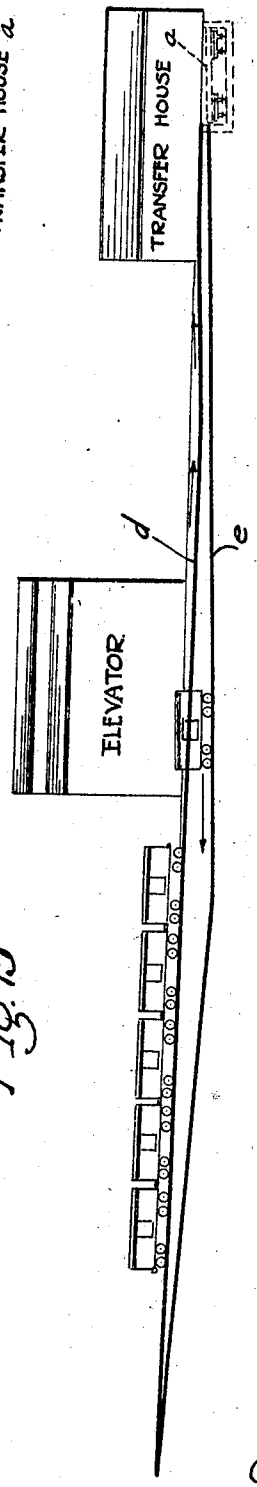


Fig. 15

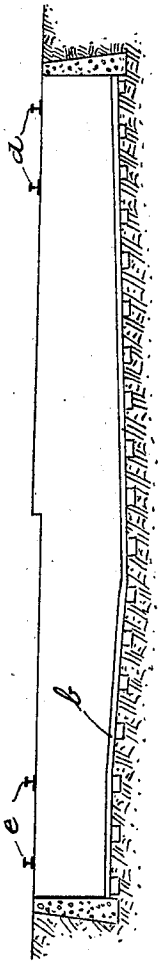


Fig. 16

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UNITED STATES PATENT OFFICE.

EDWIN C. WASHBURN, OF ENGLEWOOD, NEW JERSEY.

GRAVITY TRANSFER SYSTEM.

Application filed January 10, 1921. Serial No. 436,155.

To all whom it may concern:

Be it known that I, EDWIN C. WASHBURN, a citizen of the United States, residing at Englewood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Gravity Transfer Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to gravity transfer systems and is shown particularly in such a system adapted for handling railway cars. One important use of such a system is in connection with cars which are switched into position to be loaded or unloaded at grain elevators or dumps, and other similar structures usually located along the water front. The space along the water fronts in cities is more or less limited and land in such localities is quite expensive. If the cars are switched adjacent a building to be loaded or unloaded on the switch tracks by the use of locomotives, a large area is used for trackage.

It is an object of this invention, therefore, to provide a gravity transfer system which can be used with tracks which have their general direction normal to the line of the waterfront so that the land can be much more efficiently used than with the usual switch tracks.

It is another object of this invention to provide such a gravity transfer system which is automatically operated by the car which it is adapted to handle, so that it is moved to its various positions without being controlled by an operator.

A further object of the invention is to provide such a gravity transfer device which has means for preventing the entry of cars when it is not in position to receive the same, which means is also automatically operated.

Other objects and advantages of the device will be apparent from the following description in connection with the accompanying drawings, in which like reference characters designate the same parts throughout the different views and in which—

Fig. 1 is a plan view of the transfer device and the tracks leading thereto;

Fig. 2 is a view in side elevation of the device in car-receiving position and showing diagrammatically a car in position thereon, certain parts of the device being shown in section;

Fig. 3 is a similar view in side elevation without the car;

Fig. 4 is a view in side elevation of the device in car-discharging position, some parts being shown in section;

Fig. 5 is a somewhat diagrammatic view in end elevation of the device;

Fig. 6 is a view of the counterweight tower for the device;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 8;

Fig. 8 is an enlarged view in side elevation of part of the counterweight device, certain parts thereof being in section;

Fig. 9 is a detail of a locking latch used in the device;

Fig. 10 is a view of the same device as seen from the left of Fig. 9;

Fig. 11 is a view of one of the latch operating members;

Fig. 12 is a view of a car block device used in the system;

Fig. 13 is a partial plan view of the device shown in Fig. 11;

Fig. 14 is a plan view of the arrangement of the device relative to an elevator and serving tracks;

Fig. 15 is a view in elevation of such arrangement; and

Fig. 16 is a sectional view showing a modified form of pit tracks.

Referring to the drawings, the device comprises a movable platform *a* which is shown of suitable construction made either from I-beams or other members of sufficient strength to form a car supporting structure, which structure is supported upon spaced trucks, which, as illustrated, are two in number, which trucks run upon suitably spaced tracks *b*, and *b''*, extending at right angles to the general length of the platform *a*. The platform also carries on its upper surface a track *c* of a guage suitable for the cars to be handled. As clearly shown in the drawings, the tracks *b* and *b''* are disposed in a pit or depression which is of such depth that the track *c* will be in vertical alignment with the ends of the receiving and discharging tracks which are at the surface of the ground.

The platform *a* is, in Fig. 1, shown as in car receiving position and in this position, the track *c* is arranged to align with the loading track *d*, which track, as shown in

Fig. 2, inclines or slopes slightly toward the track *c*. The platform *a* is adapted to move on the tracks *b* and *b''* and when in its car discharging position, the track *c* is arranged to align with track *e*, which, as shown in Fig. 3, incline or slope away from the track *c*. When the platform *a* is in car receiving position, the track *c* is designed to be approximately level or to have a slight inclination upward away from the track *d*, but when the same reaches its position in alignment with the track *e*, it is designed to have a decided downward inclination toward the track *e*. To accomplish this, the tracks *b* and *b''* slope downwardly toward the car discharging position on varying grades or degrees of inclination, as indicated in Fig. 5.

As shown in Figs. 2 and 4, the track *c* at the end remote from track *d*, which end will be referred to as the outer end, is curved upwardly approximately on the arc of a circle and is arranged for contact with a bumper device 1 formed of suitable timbers. The platform *a* is held in car receiving position by engagement with the latch member 2 which is shown in detail in Figs. 9 and 10, which latch member hooks over and engages the member 3 on the platform *a*. When the car, usually one that has been loaded, is to be shifted from track *d* to the track *e*, the same will be set in motion or freed so that it will roll from the track *d* onto the track *c*. The cars are provided with projecting latch bars or couplings 4 each of which, when the car reaches the outer end of the track *c*, engages with and operates a spring or other latch 5 so that the same is locked in position on track *c* of platform *a*. It will be understood that the bumper device 1 may, if so desired, comprise suitable shock absorbing devices. A tripping member 6 shown in Fig. 11 is disposed along the side of the rails of track *c* adjacent the outer end thereof and this tripping member is rigidly connected to a shaft extending transversely to the rails and which also has connected thereto an arm 7 which is, in turn, connected to a rod 8. This rod is connected to a suitably located bell crank lever 9 which carries on the free arm thereof, a roller disposed to contact with the projection of latch 2. When the car reaches its extreme position on the track *c* the trip member 6 will be depressed, and through the connections described, will swing the bell crank lever 9 to raise the latch 2 and the platform *a* being thus freed, will move by gravity down along the tracks *b* and *b''*. Disposed adjacent to track *d* at a point suitably distant from the platform *a* is a lock-out device illustrated in Figs. 12 and 13. This device comprises a bell crank lever 10 rigidly secured to a shaft extending between the rails of track *d* and having a counterweight connected to the end of one arm thereof and a connecting rod 11 engaging the end of the other arm. This rod 11, as shown in Fig. 1, extends toward and under the platform *a* and is connected to one arm of the bell crank lever 11', the other arm of which is disposed in position to be engaged by a buffer member carried by the side of the platform *a*. When the platform *a* moves from its car-receiving position, the counterweight on lever 10 moves downwardly and arm 12 rigidly connected to the shaft of the lever 10 is swung upwardly and link members 13 and wheel buffer members 14 are also swung upwardly to the position shown in Fig. 12. As shown in this figure, the members 12 and 13 form a straightened toggle and the member 14 which is pivoted to the links 13 at one end and also pivoted to a shaft extending transversely of the rails, is moved to such position that if struck by the wheels of the car moving downwardly along track *d*, the force of the impact will be directed along the longitudinal axis of the straightened toggle. As is well known, the toggle link cannot be broken by force directed in such a manner and the member 14 will thus form an efficient block or buffer to prevent the cars moving off of track *d* when the transfer platform *a* is not in car-receiving position. When the platform *a* returns to car-receiving position, the side of the same will contact with the free arms of bell crank 11' and the connecting rod 11 will be pulled to swing the lever 10 and break the toggle, thus swinging the links 12 and 13 thereof downwardly along the rails and swinging the member 14 into a position with said top surface substantially parallel with the top of the rails so that the same will then not interfere with the car moving onto the track *c* on platform *a*.

When platform *a* reaches a position in alignment with the track *e*, it will be stopped by suitable buffer members, not shown, and will be locked by means of a latch member 15 engaging with the latch member 16 suitably actuated by a spring or other means, and which is similar to the latch member 2. As shown in Figs. 2 and 4, the latch member 5 which holds the car on the track *c*, is provided with a trip member 17 extending downwardly through the platform *a*, and when the said platform reaches its car-discharging position, this trip member engages with a cam member 18 having an inclined surface, and a latch or coupling pin 5^a is thereby raised to unhook and free the car on the track *c*. The car now being freed moves by gravity off of the track *c* onto the track *e*, from which it can be moved to any desired position. A trip member 19 similar in construction to the member 6, shown in Fig. 11, is disposed at considerable distance from the platform *a* and is rigidly connected to a shaft fixed in suitable

bearings, and which also has rigidly secured thereto an operating arm 20 connected by a rod 21 to a trip mechanism adapted to trip latch 16, which latter mechanism is similar to the trip mechanism for latch 2, which is shown in Figs. 9 and 10. When the car has passed completely off of the track *c*, the wheels thereof will operate the member 19 and the trip latch 16 will be released and the platform *a* will now be free.

To return the platform *a* to its car-receiving position, any suitable counterweight devices are provided which are shown as disposed on the tower 22 (see Figs. 6, 7 and 8). If the location is suitable, the counterweight members may, of course, be disposed in a pit, but in the vicinity of water fronts the soil is often unsuitable for such a structure and a tower is more cheaply and conveniently constructed. It will be noted that when the platform *a* moves to car discharging position it comprises the added weight of the loaded car. The car being now discharged, the counterweight members are designed to be of sufficient weight to move the platform up the tracks *b* and *b''*, to its car-receiving position. The counterweight members slide in guides 23 provided for the tower 22, these counterweight members being connected by suitable cables 24 to the side of the platform *a*, which cables are adapted to run over suitable sheaves 25. When the platform *a* reaches its car-receiving position, the latch 2 is again automatically operated thereby and the platform is in readiness to receive another car. As cars vary greatly in weight, due to the different structures of the same, and as the loaded weight of the same varies considerably, the counterweight guides 23 are provided with friction shoes 26 adapted to contact with the sides of the sliding weights to retard the motion of the same. As shown in Figs. 6 and 8, these shoes 26 are moved inwardly by a weighted lever 27 connected to another lever 28 which is, in turn, connected to links 29 controlling the shoes 26. By suitably varying the counterweight 30, the desired amount of friction on the main counterweights which slide into guides 23 can be suitably adjusted. The adjustable control of the counterweight members has two important functions. It not only affords an adjustment by which the various weights of cars can be compensated for, but it also insures that the platform *a* will not move with too great speed to its car-discharging position, or will not be returned with too great speed. The friction shoes 26 thus act as regulating brake members which insure a gentle and desirable motion of the platform *a*.

The operation of the device having been described in connection with the description thereof, it will not be necessary to repeat the same. It will be seen from the description that applicant has provided a simple and efficient transfer device by which the cars may be quickly and easily transferred from one track to another. With such an arrangement, the elevators or storage houses can be placed very close to the water front, the car handling tracks can be located adjacent thereto and disposed in a direction perpendicular to the line of the waterfront.

In Figs. 14 and 15, one arrangement of tracks is shown. By reference to Fig. 14 it will be seen that track *d*, as shown in this figure, slopes toward the transfer mechanism for some distance at quite an angle and then just adjacent the same slope upward at a much smaller angle. The cars can thus be started down the steeper grade and will acquire sufficient momentum to pass up the lesser grade and will roll onto the transfer mechanism with decreased speed. In leaving the transfer mechanism, the track *e* is shown as arranged with a rather steep downward slope and then with an upward slope. The cars will acquire sufficient speed in the down-grade to roll up the up-grade and out on the level tracks beyond with much reduced speed, thus eliminating heavy bumping or jarring with other cars.

In Fig. 16 the track *b* is shown as having a level portion at its end adjacent the track *e* which will be the end of the track occupied by the platform *a* when in its car discharging position. Adjacent the level portion of the track is a portion extending downwardly therefrom and this downwardly extending portion merges with the upwardly sloping portion which extends to the car receiving end of the track adjacent the track *d*. The track *b''* will, of course, be inclined in the same manner as the track *b*. As the platform *a* moves from car receiving to car discharging position, it will move down the slope extending from the car receiving position and will then move onto the slope extending upwardly to the level portion adjacent the track *e*. The platform will be retarded as it passes over the upwardly sloping portion and will rise gently onto the level portion. This arrangement will largely eliminate the need of a shock absorber for the platform *a*.

The automatic operation of the device affords a great saving and expense in the handling of cars and also a great saving in time. The cars can be moved into and from loading positions without waiting for the services of a locomotive. This is a great convenience when it is desired to keep the elevator busy at all times.

In Figs. 14 and 15, the disposition of the elevator or elevators and the transfer house in which the transfer device is housed is illustrated. Bays from the main harbor or water front will extend back alongside of

the elevators. It will be seen that very little trackage is needed to handle the cars by the herein disclosed mechanism.

It will, of course, be understood that various changes may be made in the form, details and arrangement of applicant's device without departing from the scope of the invention, which generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. A gravity transfer system having in combination, a movable platform carrying a track, a loading track sloping toward the same with which the first mentioned track is adapted to align when in car receiving position, sloping tracks on which the platform is adapted to move by gravity to a car discharging position, a track sloping away from the platform with which the first mentioned track is adapted to align, means for automatically locking the platform in car receiving and car discharging positions, and means for returning the platform to car receiving position.

2. A gravity transfer system comprising a movable platform having a track thereon adapted to receive a car, a locking means for automatically engaging said car to hold the same on said platform, a locking means automatically operated by said platform to hold the same in car receiving position, and means for tripping said last mentioned locking mechanism so located that it will be operated to free said platform when the car reaches its locking position thereon.

3. A gravity transfer system having in combination, a movable platform adapted to move from car receiving to car discharging position and having a track thereon, a loading track in alignment with said track at one end of the platform and sloping toward the same, a lock-out device for cars adjacent said loading track, and automatic means for operating the same when the platform moves from car receiving position.

4. A gravity transfer system having in combination, a movable platform adapted to move from car receiving to car discharging position and having a track thereon, a loading track in alignment with said track at one end of the platform and sloping toward the same, a lock-out device for cars adjacent said loading track, automatic means for operating the same when the platform moves from car receiving position, and means operated by said platform when it returns to car receiving position to render said lockout means inoperative.

5. A gravity transfer system having in combination, a movable platform arranged to move from car receiving to car discharging position, means for automatically locking the same in car receiving position, trip means for releasing said locking mechanism when a car is in proper position on said platform, means for locking said platform in car discharging position, and means for releasing said last mentioned locking mechanism when the car has been discharged from said platform so that the platform is free to be again moved to car receiving position.

6. A gravity transfer system having in combination, a platform adapted to move by gravity from car receiving to car discharging position, a locking means thereon for engaging a car to hold the same in proper position on said platform, and a trip means adapted to be operated when the platform reaches the car discharging position to release said locking means, so that the car may be discharged from said platform.

7. A gravity transfer device having in combination, a movable platform adapted to move by gravity from car receiving to car discharging position, a track on said platform adapted to be disposed substantially horizontal when in car receiving position, track members upon which the platform moves arranged in various degrees of inclination so that when the platform reaches car discharging position, the track thereon has a decided slope toward the discharge end.

8. A gravity transfer device having in combination, a movable platform adapted to move by gravity from car receiving to car discharging position, counterweight members for moving said platform from car discharging to car receiving position, and adjustable friction members arranged to engage said counterweights to act as brake members and to compensate for the varying loads of cars.

9. A lock-out device for a gravity transfer system having in combination, a pivoted buffer member disposed adjacent the track, a toggle link adapted to be straightened to hold said buffer member in operative position, automatic means for moving said buffer member and toggle link to operative position, and means actuated by the gravity transfer device for moving said buffer member and toggle link to inoperative position.

10. A gravity transfer system having in combination, a movable platform carrying a track, a loading track sloping toward the same with which the first mentioned track is adapted to aline when in car receiving position, sloping tracks on which the platform is adapted to move by gravity to a car discharging position, and a track sloping away from the platform with which the first mentioned track is adapted to aline.

11. A gravity transfer system having in combination, loading and unloading tracks, a car transferring platform having a track thereon, and being movable to positions in which said track is in alinement with one

of said loading or unloading tracks and automatic means for holding said car on said platform during the movement thereof.

12. A gravity transfer system having in combination, a platform having a car receiving track thereon, a loading track sloping toward the platform, and a discharging track spaced therefrom sloping away from the platform, said platform being movable from position adjacent and alined with the loading track to a position adjacent and alined with the discharging track and means for preventing a car passing from said loading track toward the platform when the latter is out of alinement with said loading track.

13. A gravity transfer apparatus having in combination, loading and unloading tracks, a car transferring platform movable into alinement with said tracks and in relation to which said tracks are inclined at different angles, respectively, and automatic means, including a counterweight, controlling the movement of said platform.

14. A gravity transfer apparatus having in combination, loading and unloading tracks, a car transferring platform movable into alinement with said tracks away from which said tracks slope, and means for preventing movement of said platform away from the unloading track until a car has entirely passed therefrom.

15. A gravity transfer system having in combination, loading and unloading tracks, a car transfer platform having a track thereon and being movable to positions in which said track is in alinement with one of said loading or unloading tracks, and an automatically operated lock-out device for preventing a car moving from said loading track when said platform is out of alinement therewith.

16. The structure set forth in claim 15, said lock-out device comprising a toggle link mechanism.

17. A gravity transfer system having in combination, loading and unloading tracks, a car transferring platform having a track thereon and being movable to positions in which said track is in alinement with one of said loading or unloading tracks, a tower, and a counterweight vertically movable thereon controlling the movement of said platform.

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

EDWIN C. WASHBURN.

Witnesses:

I. HYMAN,

S. H. BOGERT.