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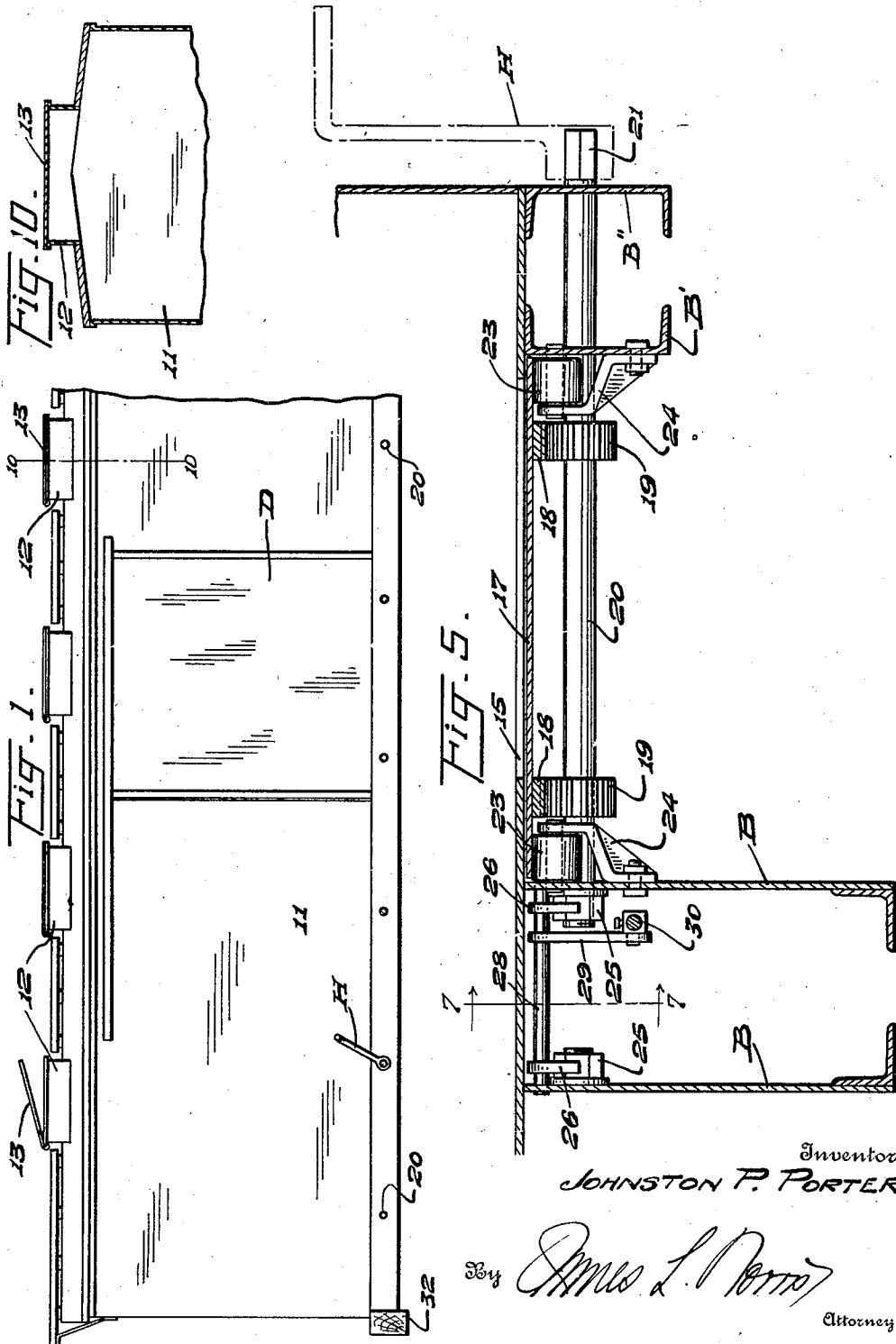
J. P. PORTER

1,715,307

FREIGHT BOX CAR

Filed May 15, 1928

3 Sheets-Sheet 1



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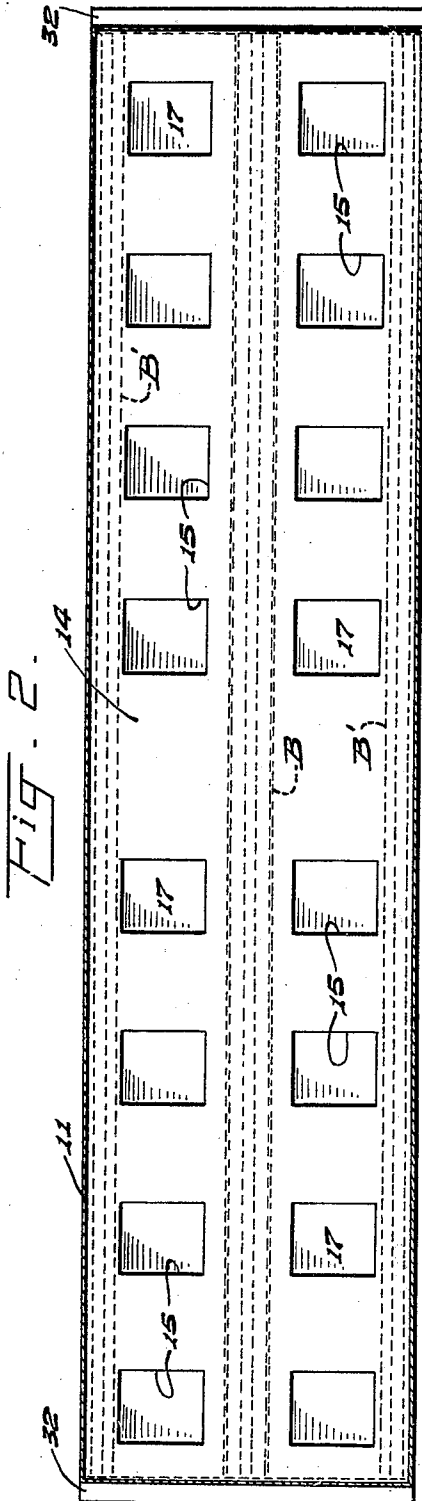
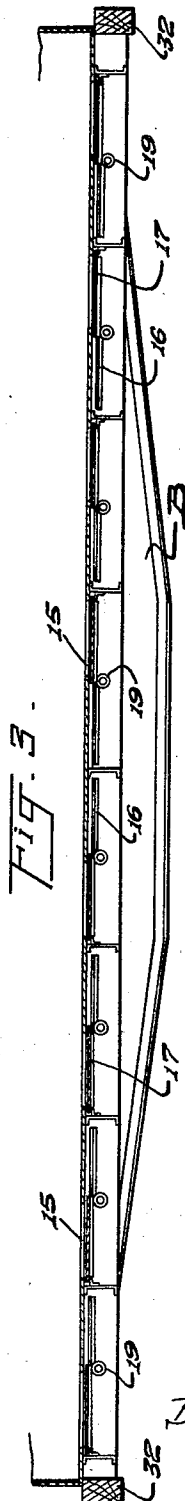
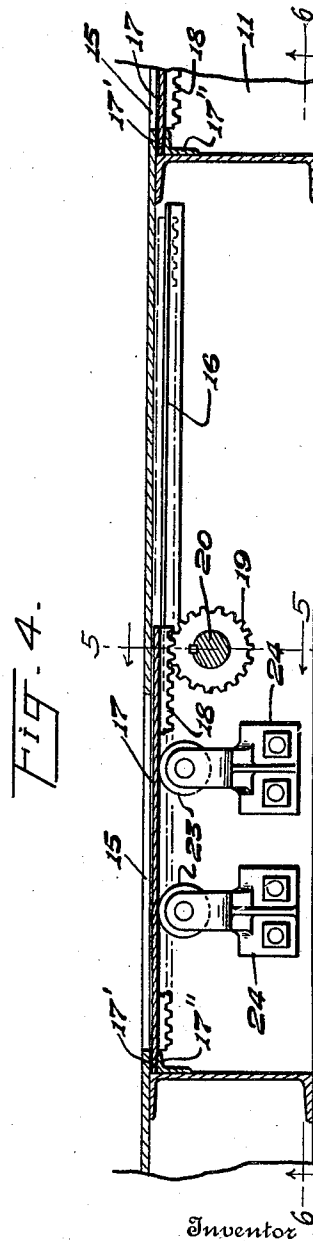
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FREIGHT BOX CAR

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3 Sheets-Sheet 2



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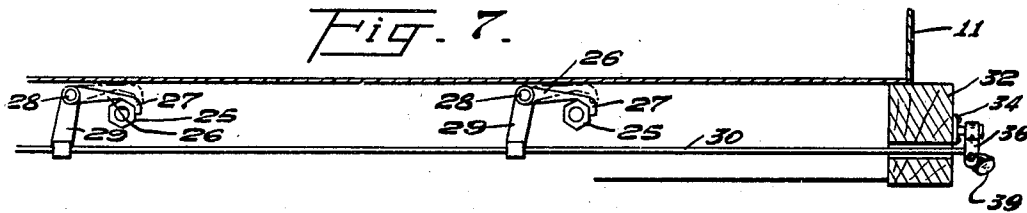
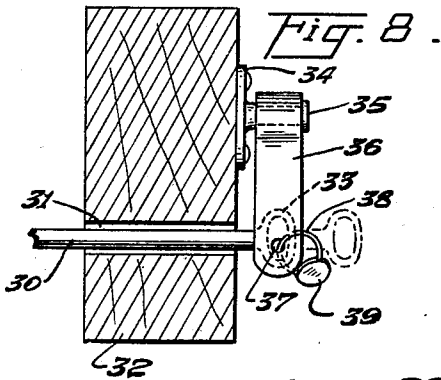
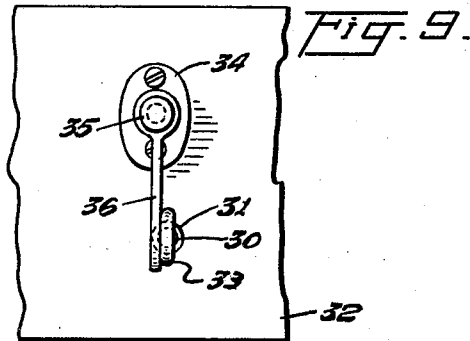
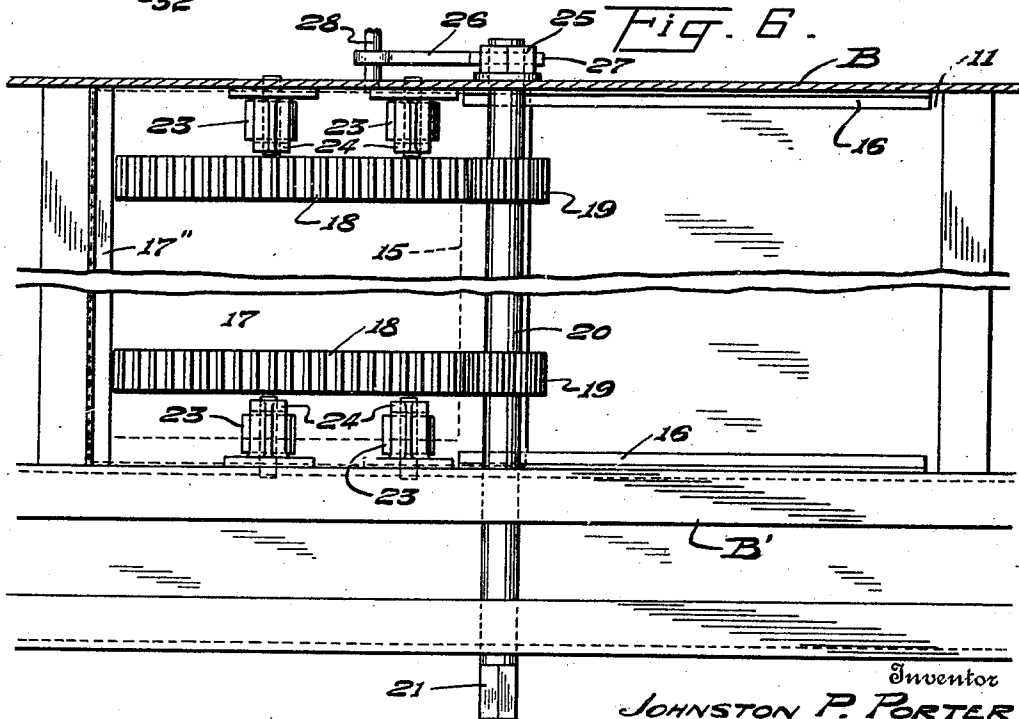
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FREIGHT BOX CAR

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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FREIGHT BOX CAR.

Application filed May 15, 1928. Serial No. 277,871.

This invention relates to improvements in freight box-cars, one object of the invention being the provision of a box car with means whereby grain, coal or coke may be loaded through the top thereof, and whereby the contents of said car may be unloaded through the bottom thereof.

A further object of this invention is the provision of means located in the bottom of a box-car, the bottom of which is flat, whereby openings in the bottom of the car may be closed when the car is loaded and in transit, and be opened, one at a time, to permit the unloading of the material within the car through the bottom thereof, this type of car being especially designed for transporting grain or coke and coal, so that coal may be brought from one terminus to the other terminus, there unloaded, and the car loaded with grain to be carried back to the initial terminus, thus providing a means whereby the car is made useful in both the outgoing and the ingoing trips.

A still further object of this invention is the provision of a means for operating the closures in the bottom of the car in a simple and inexpensive manner, and the provision of a locking device whereby all of the closure-operating members may be simultaneously locked or released to permit the speedy opening and closing of the various closures and the consequent release of the contents of the car.

In the accompanying drawings:—

Figure 1 is a side elevation of the greater portion of a box-car showing the door or closure of one of the loading hoppers open and with the operating handle for actuating the floor closures in elevation;

Figure 2 is a horizontal sectional view through a complete car looking toward the floor thereof and illustrating the position of the unloading openings thereof;

Figure 3 is a longitudinal sectional view centrally of one of the longitudinal rows of unloading openings of the car floor;

Figure 4 is an enlarged detail sectional view of one of the openings in the car floor and its closure and operating mechanism;

Figure 5 is a cross-section on line 5—5 of Figure 4.

Figure 6 is a section taken on line 6—6 of Figure 4;

Figure 7 is a sectional view taken centrally of the car on the line 7—7, Figure 5 and show-

ing two of the locking members or locks connected to their operating rod;

Figure 8 is a view, on an enlarged scale, of the means for locking and sealing the lock-operating rod shown at the right-hand end of Figure 7;

Figure 9 is a view taken from the left of Figure 8; and

Figure 10 is a cross-section through the top of the car showing one of the loading hatches of which the door or closure is shown in closed position.

Referring to the drawings, the numeral 11 designates the box-car proper which is here indicative of any type of box-car with the side opening door D or any type of opening whereby the car may be used for general purposes, as is the present practice. Distributed throughout the length of the roof of the car are a plurality of hatches 12 which constitute the loading openings for the present arrangement, each one of which is provided with a hinged door 13 for closing the same, as illustrated in Figures 1 and 10. By this arrangement, it is merely necessary for the doors 13 to be raised and the various hoppers disposed in cooperative relation with the outlet spouts of the grain elevators or fuel hoppers so that the cargo to be received within the car may be loaded through these openings.

The floor 14 of the car is of usual construction, and upon each side of the longitudinal center thereof and also upon each side of the reinforcing beam B are disposed or formed a plurality of unloading openings 15, the same being shown rectangular in shape, as illustrated in Figure 2, and being positioned as there illustrated so as to produce the best results and at the same time avoid interference with any of the underhung mechanism or beams of the car.

Disposed beneath the floor, at one side of and parallel to the longitudinal edges of each opening 15, are the two guide members 16 for the flat plate closure 17, each of which closures, when closed, as illustrated in Figure 4, having its free end 17' seated beneath the adjacent portion of the floor and upon the angle iron 17'. Attached to the under side of each of these closures 17 are two parallel rack bars 18, the teeth of which mesh with gears 19 keyed to and rotatable with a closure operating shaft 20, this shaft, as clearly illustrated in Figures 4, 5 and 6, being journaled in the respective beams B and B'

so that the irregularly shaped end 21 of said shaft will be disposed exteriorly of the car and will be readily accessible to receive the removable operating handle H. By this arrangement, the closures 17 have imparted thereto a straight-line movement to and from the angle iron 17'', and each of said closures is operated individually throughout the series, rollers 23 being disposed to engage the under portion of the closure between the outer edges of the racks 18 and the longitudinal edges of the closures to provide an anti-frictional support therefor, such rollers being mounted in brackets 24 and supported, respectively, from the beams B and B'.

Upon the inner end of each of the shafts 20 is disposed an irregularly shaped nut 25, the same being shown in this instance as hexagonal, which nut has two purposes; namely, to limit the outward movement of the shaft 20, and at the same time act as one locking member to prevent the rotation of the shaft when necessary. In order to accomplish this result, there is provided a plurality of pivoted locking levers 26 each equipped with the irregular hooked end 27. The hooked ends of the locking levers, when in the position as shown in Figure 7, engage the nuts 25 to lock the shafts 20 against rotation. These levers 26 are carried by and movable with the rock shaft 28, which shaft 28, as shown, is mounted between the beams B adjacent the under side of the floor, as illustrated in Figure 5, and carries the opposite locking lever 26 of the shaft 20 at the opposite side of the floor of the car. All of the shafts throughout the length of the car and upon both sides of the beam B may be simultaneously locked or released by means of arms 29, each of which has one end secured to one of the shafts 28 and its other end attached to a rod 30 which extends throughout the length of the car between the beams B and has one end extending through an opening 31 in the cross-beam 32 at either end of the car, as particularly illustrated in Figures 7, 8 and 9. The end of the rod 30 which projects through the opening 31 is provided with an operating handle 33 by means of which the rod may be longitudinally shifted to simultaneously move the hooked ends 27 of the levers 26 into and out of engagement with the nuts 25, as shown in Figure 7, to thus lock the shafts 20 against rotation, or to release them so that the same may be operated one at a time to open or close the doors or closures 17.

In order to provide a means for sealing the rod 30, as is the usual practice in freight departments of various railroads, a support 34 is connected to the beam 32 at the outer face thereof and carries a pin 35 upon which is swingingly mounted a plate or arm 36. This arm 36 is provided with an aperture 37 which is adapted to coincide with the handle 33 when the device is in locked position so that

the wire 38 may be placed through the handle and the opening 37 and the lead seal 39 be compressed to thus seal the lock, so that only authorized persons may break the seal to actuate the rod 30 and release the movable locking members 26 from the shaft-carried locking members 25.

From the foregoing description, taken in connection with the drawings, it is evident that a box-car equipped with the present loading and unloading facilities may be loaded from the top with the material to be transported, such, for instance, as wheat or other grain, at one terminal of the railroad, and may be unloaded at the receiving point, in many cases, at the other terminal of the railroad. In this type of car, when the closures 17 have been moved to open position to release the cargo, a certain amount of the cargo will remain upon the floor 14, thus necessitating the shoveling or sweeping of the same from the spaces between the openings 15 due to the action of the cargo in passing, by gravity, through the openings, there usually being pyramidal formations of the cargo disposed at each of these blank spaces which require removal manually or otherwise through said openings. When the cargo has been unloaded at the receiving terminal, the car may be loaded with a cargo, as, for instance, coal or coke, which it is desirable to ship to the opposite terminal of the line, and thus with a car of this type, there is no necessity of returning the same empty, as is the practice in grain shipment in the northern part of the United States and Canada at the present time.

It will also be apparent that box-cars provided with this type of loading and unloading mechanism are not rendered undesirable for the shipment of other goods, as the cars may be provided with the usual side and end openings, so that various classes of cargoes, as automobiles, lumber, etc., may also be carried.

What is claimed is:—

1. A freight box-car the bottom of which is provided with a plurality of unloading openings, a slidable closure mounted beneath each of said openings, manually operable means for operating each one of said closures, a locking device for each one of said operating means, and means for simultaneously operating all of said locking devices so that all of the closure operating means may be locked or released simultaneously.

2. A freight car having a centrally disposed beam below the floor thereof, said floor being provided with a plurality of unloading openings to the outer side of said beam, a pair of guides disposed below the floor of the car adjacent each opening, a flat plate closure mounted in each pair of guides for movement below the floor to seal said openings, a plurality of shafts, one for each of said closures,

each of said shafts journaled in the beam and operable from the exterior of the car, cooperative means carried by each plate and its associated shaft whereby the plate is reciprocated to control the opening, cooperative locking means carried by one end of each of the shafts and the beam, and manually controlled means for operating said locking means to lock or release the shafts.

10 3. A freight car having a beam disposed longitudinally and centrally below the floor thereof, said floor being provided with a plurality of unloading openings at one side of
15 said beam, a pair of guides disposed below the floor of the car adjacent each opening, a flat plate closure mounted in each pair of guides for movement below the floor to seal said openings, a shaft journaled in the beam and operable from the exterior of the car, cooperative means carried by the plates and the
20 shaft for moving said plates into and out of position to close said openings, anti-frictional means carried by the beam and engaging the under side of the plates to prevent the flexing thereof during the movement of the
25 plates, cooperative locking means carried by one end of the shaft and the beam, and manually controlled means for operating said locking means to lock or release the shaft.

30 4. A box-car having a floor provided with a plurality of unloading openings, longitudinally disposed beams supporting the floor adjacent the center and the side edges thereof, a flat closure mounted for sliding movement below the floor and adjacent each opening, a pair of rack bars attached to each closure, a plurality of shafts journaled in the
35 beams, one to each closure, gears carried by each shaft and engaging the racks for mov-

ing said closures into and out of closing position, the outer ends of the shafts being projected exteriorly of the side edge beams to permit the actuation of the closures from the exterior of the car, cooperative locking means carried by each shaft and the central beam of
45 the car, and a longitudinally shiftable rod mounted adjacent the center beam and accessible from the end of the car for actuating the locking means and simultaneously locking or releasing all of the shafts.

50 5. A box-car having a floor provided with a plurality of unloading openings, longitudinally disposed beams supporting the floor adjacent the center and the side edges thereof, a flat closure mounted for sliding movement
55 below the floor and adjacent each opening, a pair of rack bars attached to each closure, a plurality of shafts journaled in the beams, one to each closure, gears carried by each shaft and engaging the racks whereby the rotation of the shaft reciprocates the closures, the outer ends of the shafts being projected
60 exteriorly of the side edge beams to permit the actuation of the closures from the exterior of the car, cooperative locking means carried by each shaft and the central beam of
65 the car, a longitudinally shiftable rod mounted adjacent the center beam and accessible from the end of the car for actuating the locking means and simultaneously locking or releasing all of the shafts, and cooperative seal-receiving means carried by the rod
70 and by the car for securing the rod against unauthorized movement.

In testimony whereof I have hereunto set my hand.

JOHNSTON P. PORTER.