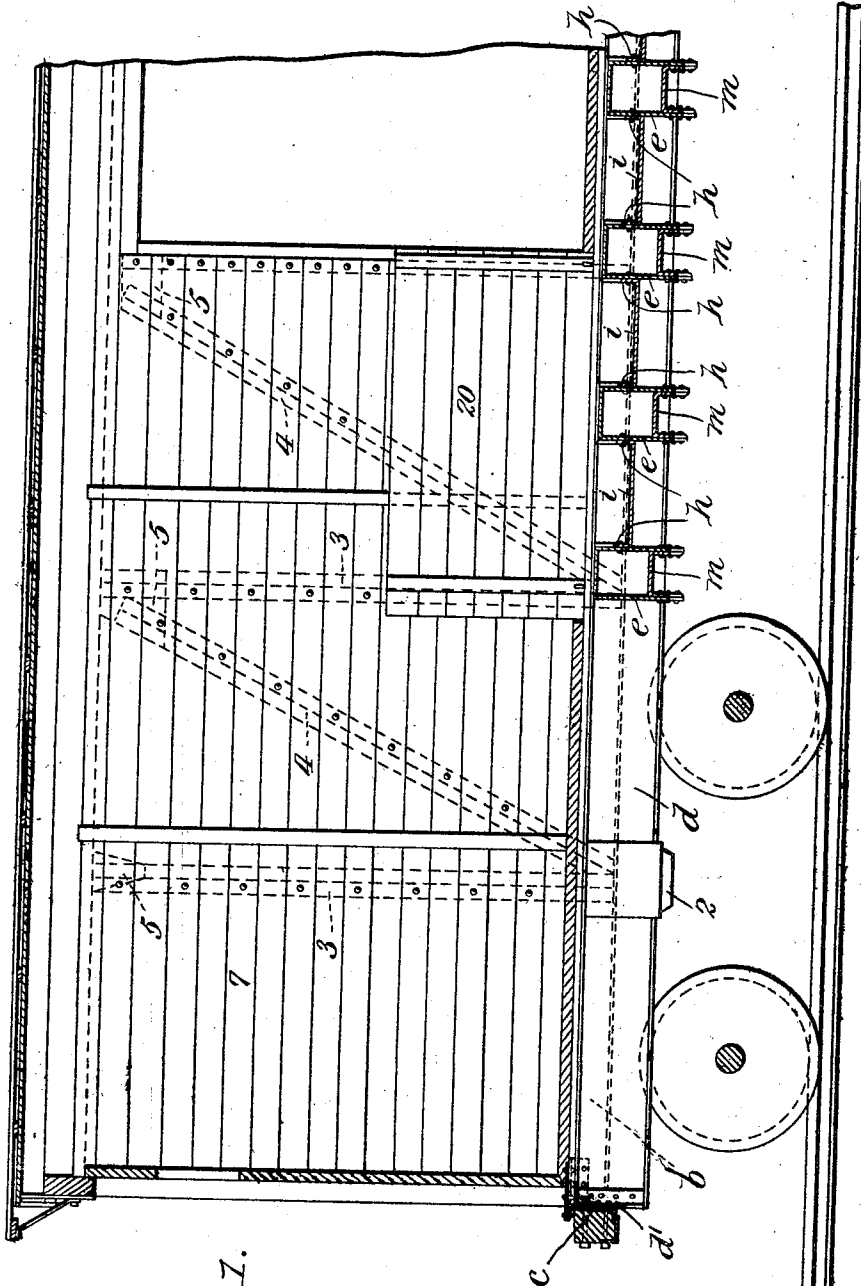


H. H. VAUGHAN.
DUMP CAR.
APPLICATION FILED APR. 1, 1910.

1,018,140.

Patented Feb. 20, 1912.

5 SHEETS—SHEET 1.



Witnesses
Arthur B. Bickel
W. H. Bickel
Fig. 1.

Henry H. Vaughan
Inventor
By Attorney
John N. Mann

H. H. VAUGHAN.

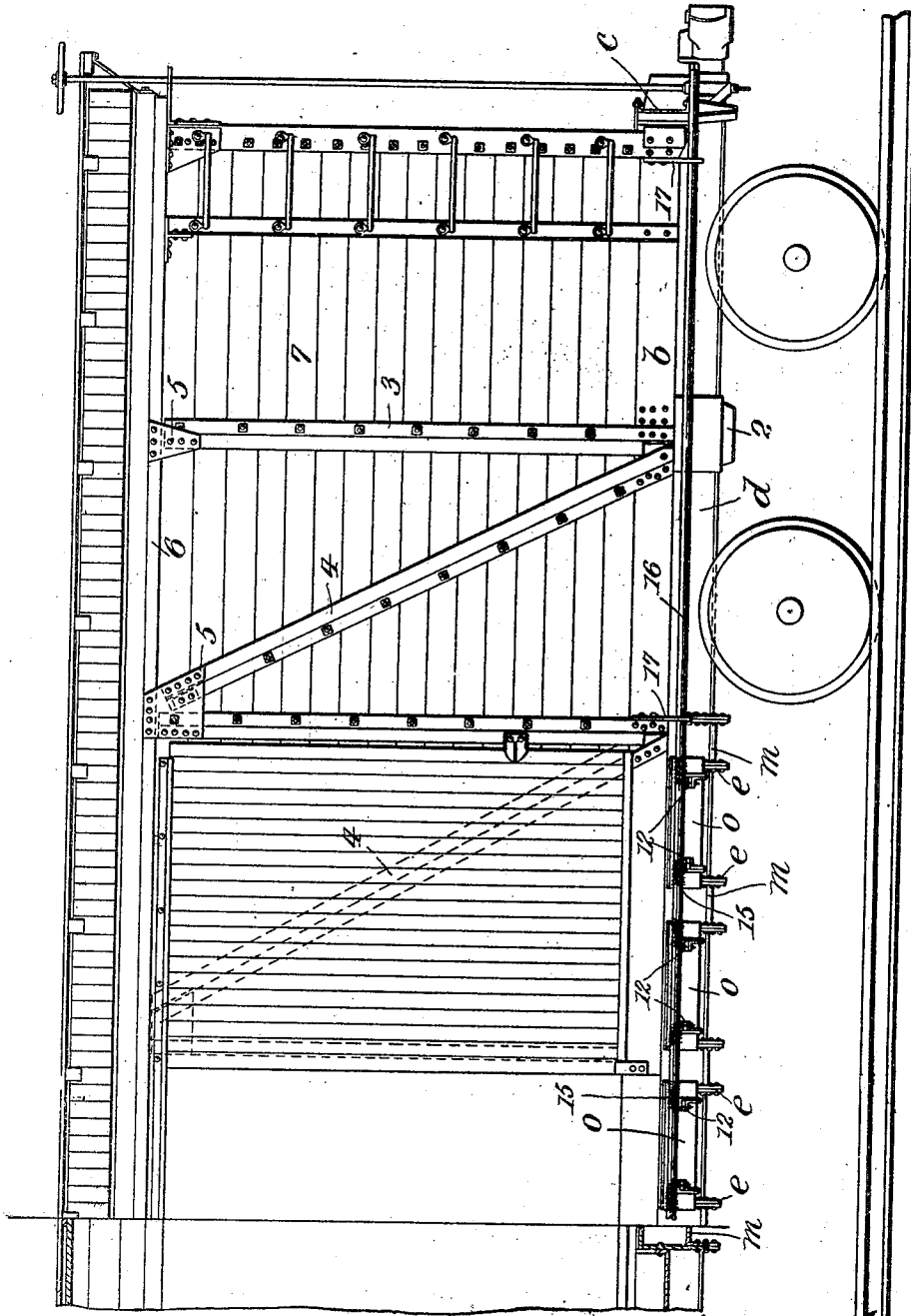
DUMP CAR.

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5 SHEETS—SHEET 2.



Witnesses
Albion B. Bickel
Wm. H. Bickel
Aug. 20.

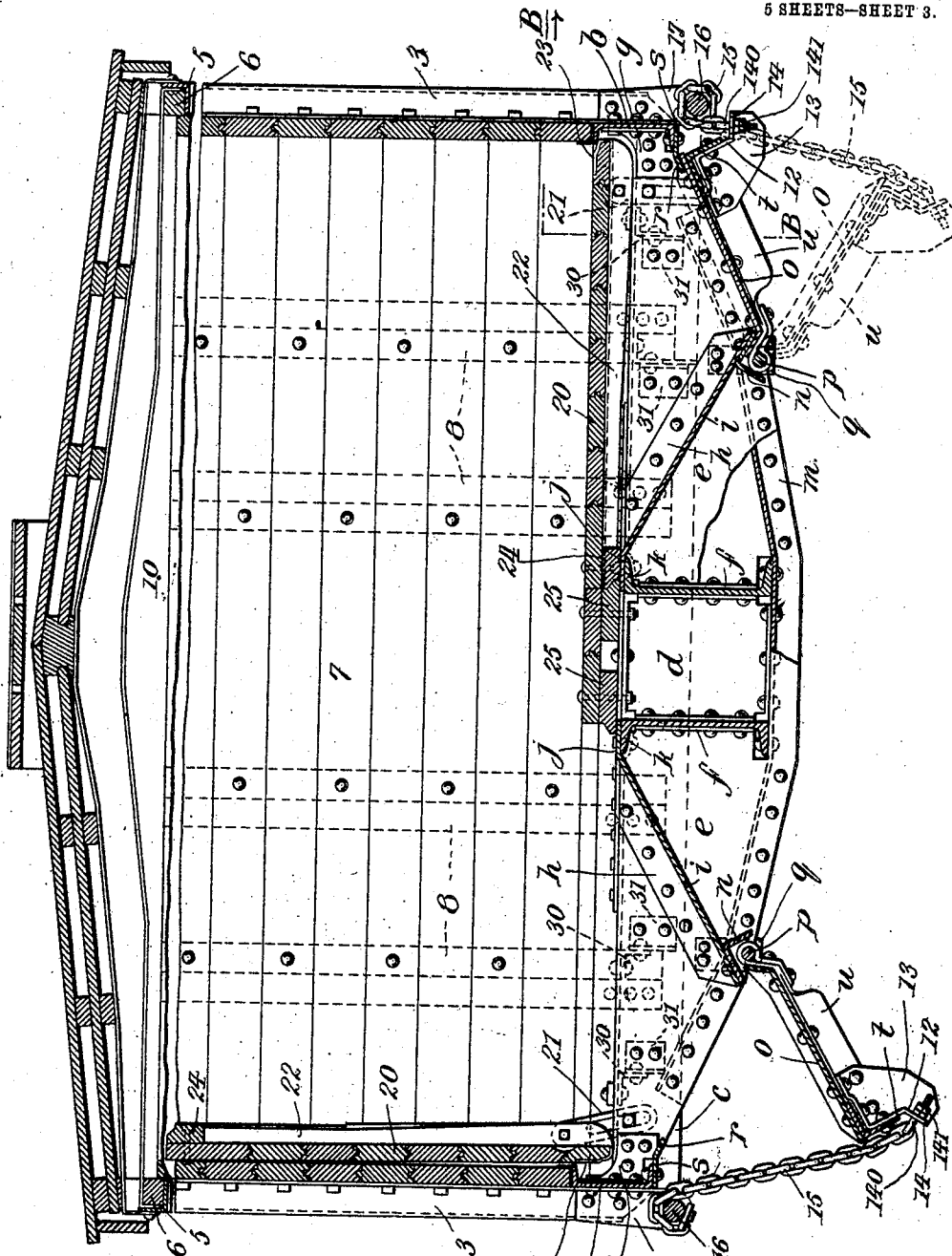
Henry H. Vaughan
Inventor
By Attorney
John W. Bickel

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5 SHEETS—SHEET 3.



Witnesses

Richard P. Bataillon
Wm. J. Patton

Fig. 3.

Henry H. Vaughan
Inventor

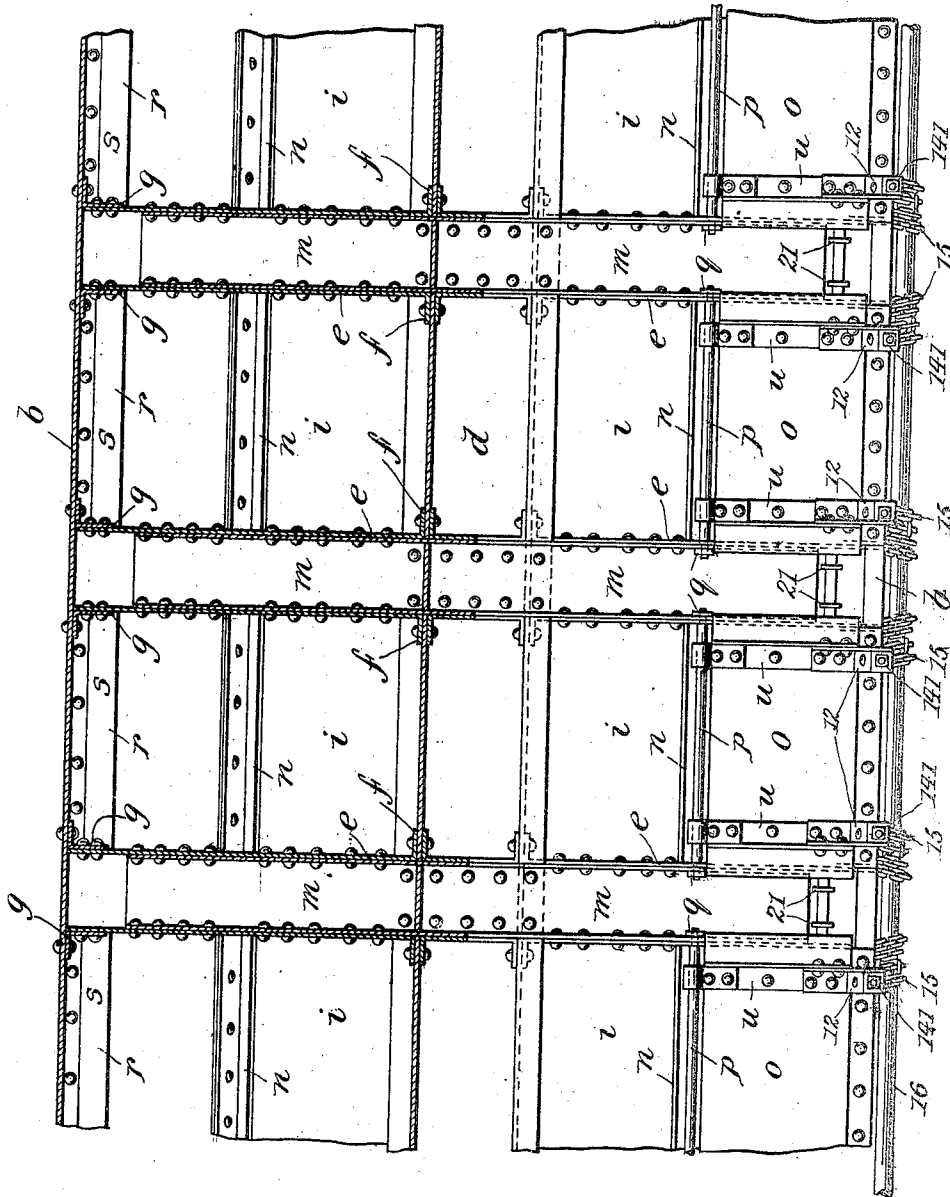
By Attorney
John H. Mann

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6 SHEETS—SHEET 4.



Witnesses
Richard P. ...
...
Fig. 4.

Henry H. Vaughan
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By Attorney
John N. ...

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5 SHEETS—SHEET 5.

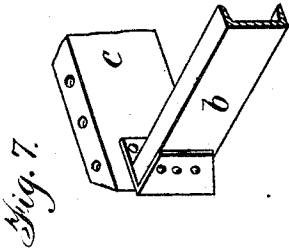
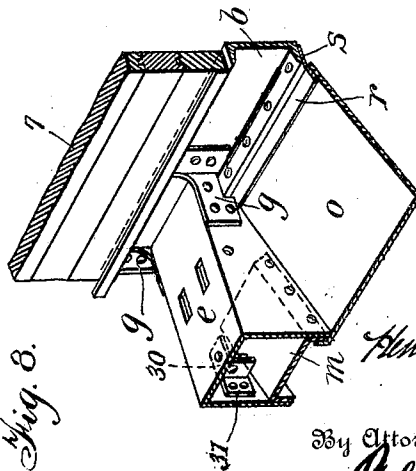
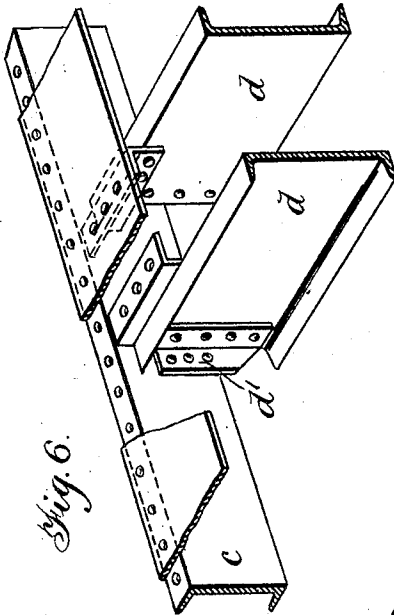
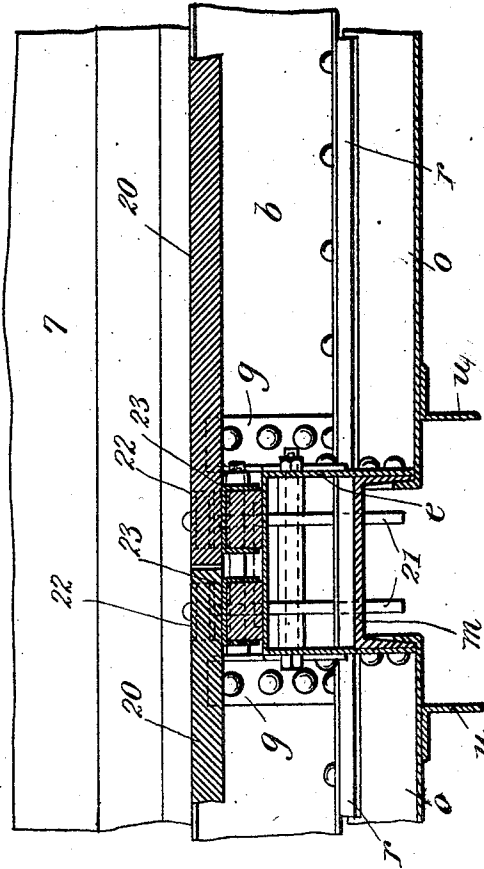


Fig. 5.



Witnesses

Wm. H. Vaughan
Edw. H. Vaughan

Fig. 8.

Henry H. Vaughan
Inventor
By Attorney
Edw. H. Vaughan

UNITED STATES PATENT OFFICE.

HENRY HAGUE VAUGHAN, OF MONTREAL, QUEBEC, CANADA.

DUMP-CAR.

1,018,140.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed April 1, 1910. Serial No. 552,873.

To all whom it may concern:

Be it known that I, HENRY HAGUE VAUGHAN, of the city of Montreal, in the Province of Quebec, Canada, have invented
5 certain new and useful Improvements in Dump-Cars; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates particularly to convertible cars of the type having hoppers with doors, and displaceable floor members covering the said hoppers; and it has for its object to provide an improved device for preventing leakage over the free end of the door when closed, improved means for operating the doors and a convertible car of this type wherein the center sill, cross bearers, and hoppers are suspended from the sides of the car.

10 The invention may be said to consist of the construction and combination and particular arrangement of parts hereinafter described and pointed out in the claims. For full comprehension, however of my invention reference must be had to the accom-
15 panying drawings forming a part of this specification, in which similar reference characters indicate the same parts, and wherein—

30 Figure 1 is a longitudinal sectional view of one half of my improved convertible car; Fig. 2 is a side elevation of the other half thereof; Fig. 3 is an enlarged transverse sectional view; Fig. 4 is an enlarged detail bot-
35 tom plan view partly in section; Fig. 5 is an enlarged detail longitudinal sectional view taken on line B, B, Fig. 3 illustrating particularly the engagement between the side flanges of the doors and the door frame;
40 Fig. 6 is an enlarged detail perspective view illustrating the connection between the center and end sills; Fig. 7 is a similar view illustrating the connection between the side and end sills; and Fig. 8 is an enlarged detail perspective view illustrating the con-
45 nection between the main parts shown in Fig. 5.

50 The under framing or sub-structure of my improved car consists of longitudinal side sills *b b* of channel form set on edge with their flanges facing inwardly, transverse end sills *c c* riveted to the side sills, a longi-

tudinal center sill *d* of box like cross-section the ends whereof are rigidly connected by angle brackets *d'* to the end sills, and a series of uniformly spaced cross bearers *e* of inverted U cross-section having the inner ends of their legs oppositely flanged as at *f* and riveted to the center sill, their lower edges inclined upwardly and outwardly, and
55 their outer ends connected by angular brackets *g* to the side sills. The legs of the cross bearers constitute hopper walls and have riveted thereto the upwardly turned flanges *h* of fixed inclined hopper-floor mem-
60 bers *i* located between the bearers with their upper ends *j* overlapping and riveted to the flanges *h* of the center sill; the walls being braced and the lower edges thereof stiffened by channel members *m* the flanges of which
65 are riveted along the edges of the said walls; while the lower edge of the hopper-floor members *i* are stiffened by angle irons *n* riveted thereto. A series of doors *o* of trough form with their free ends open, each
70 hinged by a hinge rod *p* to brackets *q* fixed to the cross bearers *e*, are so disposed as to have their hinged ends which are inclined with relation to the bottom of the trough, covered by one leg of the angle iron *n* and,
75 when the door is closed, lie in tight contact with the flange of such angle iron fixed to the floor member, the free end of the door, at the same time lying in tight contact with a fixed lip *r* presented by a diagonally down-
80 wardly bent plate *s* riveted to the underside of the bottom flange of the adjacent channel iron side sill, the inclination of this bent lip coinciding with the closed door and pre-
85 venting leakage over the end thereof and the tight contact between the inclined or angular hinged end and the flange of the angle iron serving the same purpose at that end. These doors are each reinforced at their free ends by angle irons *t* and longitudinally
90 thereof by angle-irons *u* formed to overlie the angle-iron *t*. The center sill and cross-bearers of this sub-structure or under-framing constitutes a truss suspended at its ends from the side sills, and in order to provide
95 the necessary reinforcement for the side sills to transmit the load to the bolsters 2, I employ steel frame sides preferably comprising vertical and diagonal stays 3 and 4 respec-

tively, secured at their lower ends to the side sills and at their upper ends through the medium of gusset-plates 5 to the longitudinal roof members 6, such steel framing 5 being preferably furnished with sheathing 7. The ends are also reinforced by vertical stays 8 secured at their lower ends to end sills *c* and at their upper ends to the end roof members 10.

10 The means for operating the doors comprises Z-brackets 12 having web 13 by which they are fixed to the underside of the doors with one leg, 14, of the Z extending beyond the flange *t* and bent to an obtuse angle thereto. A series of chains 15 at both 15 sides of the car are connected at one end to these legs 14 by an adjustable connection consisting of an eye-bolt 140 and nuts 141, and at their other ends to shafts 16 mounted 20 rotatably in brackets 17 secured to the lower ends of some of the vertical side stays 3, the shafts being supported slightly below the level of the lips *r*. This particular location of the shafts is permitted by the Z-brackets 25 owing to the opposition of the points of connection 12 of the chains to the doors, the effect being that the doors can be lifted by the chains into tight engagement with the lips *r* without the necessity of locating the 30 lifting shafts above the lips. By this particular arrangement of the doors they form when open a continuation of the fixed hopper floor member thus enabling the car to be dumped with facility; while the adjustable connection 140, 141 permits slack in the 35 chains to be taken up.

Displaceable floor members 20 are connected by links 21 to the cross bearers near the outer ends thereof, each of such members 40 being provided with a cleat 22, a metallic reinforcement heel 23, and the free ends thereof have end bars 24 bolted thereto and formed to be seated on the side edges of fixed floor members 25 bolted to the top of 45 the center sill. As an additional reinforcement and stiffener for the cross-bearers and a support for the floor of the car a series of angle-irons 30 are riveted to the underside of the top of each of such cross bearers and 50 are secured to other angle irons riveted to the sides of the cross-bearers.

The combination of the trough door with open free end, the downwardly projecting flange, with which such free end lies in flat 55 contact the angular hinged end and the flange it engages secure the effective sealing the doors.

The advantage of the diagonally disposed trough door hinged at its lower end, is that 60 when the door is closed its free end projects diagonally upwardly beyond the edge it engages of the discharge opening and thus in effect presents to such edge a flange similar in function to the side flanges on the door in 65 that it seals the said free end of the door.

What I claim is as follows:—

1. The combination in a box car, the sides of which have steel framing, of a center sill, a plurality of laterally extending cross-bearers secured to the center sill and suspended from the sides of the car and portions of which form the sides of hoppers, such bearers having upwardly and outwardly inclined lower edges, a plurality of 70 downwardly and outwardly inclined hopper floor members arranged between said cross-bearers and secured at their inner edges to the top portion of the center sill, flanged doors hinged at their inner ends beneath the inclined hopper floor members in close proximity to the outer lower edges thereof, and adapted when closed to overlap the inclined lower edges of the cross-bearers and the edges of the hopper floors, and door 75 operating mechanism supported by the sides of the car and operatively connected to the free ends of the doors. 80 85

2. A substructure for a car, comprising the combination of side sills, a center-sill, a plurality of cross-bearers secured to the center-sill and suspended from the side sills and portions of which form the sides of hoppers, such cross-bearers having upwardly and outwardly inclined hopper floor members extending between said cross-bearers and secured at their inner edges to the top portion of the center sill, doors hinged at their inner ends in close proximity to the outer lower edges of the inclined hopper floor members and adapted to contact when 90 95 100 105 closed with the inclined lower edges of the cross-bearers, diagonal flanges formed on the inner ends of the doors and adapted to overlap and come into flat contact with the lower edges of the inclined floor members, and door operating mechanism operatively connected to the outer ends of the doors.

3. In a dump car, the combination with a center-sill, and a series of cross bearers portions of which form the sides or hoppers, of a series of inclined hopper floor members fixed at their sides to the cross bearers and at their upper ends to the center-sill and extending at an angle from the sides of the said center-sill, and a series of flanged doors 110 115 120 hinged to the lower ends of such members and forming when open a projection thereof and when closed serving as the opposite inclined hopper floor members, the flanges of the doors overlapping the edges of the cross-bearers and the lower edges of the floor members.

4. In a dump car, the combination with a center-sill and side sills, of a series of cross-bearers of inverted-U-cross-section, bracing 125 members of channel cross-section arranged between the lower portions of the sides of each cross-bearer and having down-turned flanges secured thereto, the lower edges of such flanges being substantially flush with 130

the lower edges of the cross-bearers, and flanged door members extending between the said cross-bearers and having their flanges straddling the down-turned flanges of the bracing members.

5. In a dump car, the combination with a center-sill and a series of cross bearers of inverted-U-cross-section portions of which form the sides of hoppers, of a series of inclined hopper floor members fixed to the cross-bearers, and a series of flanged doors hinged to the edges of said floor members and forming when closed the opposite inclined hopper floor members and having the flanges thereof which form the sides of the door straddling the legs of the cross-bearers.

6. A substructure for a car comprising the combination of side sills, a center-sill; a series of cross-bearers of inverted U-cross-section fastened at their opposite ends to the center-sill and side sills and portions of which form the sides of hoppers; inclined hopper-floor members located between the cross-bearers; inclined trough shaped hopper-doors adapted to constitute the balance of the hopper-flooring and having the members thereof which form the sides of the trough straddling legs of the cross-bearers; means pivoting the doors in hinged relation with the lower edges of the said fixed floor members; and means for operating the said doors.

7. A substructure for a car comprising the combination of side sills, a center-sill, a series of cross-bearers of inverted-U-cross-section fastened at their opposite ends to the center-sill and side sills and portions of which form the sides of hoppers; flanged braces connecting together the ends of the legs of each bearer; inclined hopper-floor members located between the cross-bearers and secured to the top of the center-sill and to the said bearers; inclined trough shaped hopper-doors adapted to constitute the balance of the hopper flooring and having the members thereof which form the sides of the trough straddling the legs of the cross-bearers; means pivoting the doors in hinged relation with the lower edges of the said fixed floor members; and means for operating the said doors.

8. In a dump car, the combination of a center-sill, side sills, a series of cross-bearers of inverted U-cross-section fastened at their opposite ends to the center-sill and side sills and portions of which form the sides of hoppers and having their lower edges forming the sides of hopper discharge openings, a series of downwardly and outwardly inclined hopper floor members extending between such cross-bearers, a series of flanged doors hinged adjacent to the lower edges of the said hopper floor members and having the flanges straddling the legs of the

cross-bearers and the lower edges of the floor members, and means for operating the said doors.

9. In a car, the combination with the frame thereof, of a hopper floor member presenting with the car frame an inclined discharge opening, a pair of inclined downwardly projecting flanges formed on the frame adjacent to the sides of the discharge opening, a flange in the plane of the discharge opening extending between the said downwardly projecting flanges and forming the upper front edge of such discharge opening, and a door hinged to the hopper floor member and having rear and side flanges adapted to inclose the said downwardly projecting flanges and the lower edge of the hopper floor member, and having its free end adapted to overlap and come into flat contact with the flange forming the upper front edge of the opening.

10. In a car the combination with the frame thereof, of a fixed inclined hopper floor member presenting with the car frame an inclined discharge opening; an inclined flange fixed to the frame and extending in the plane of the opening to form the upper front edge thereof; and a door of trough form hinged at the lower end of such inclined fixed floor member and presenting at such hinged end an angular portion adapted to overlap and come into flat contact with the said inclined lower end of the fixed floor member and the opposite free end of the door overlapping and coming into flat contact with the said inclined flange forming the upper front edge of the opening.

11. In a dump car, the combination of a center-sill, side sills, cross-bearers connecting such side and center-sills and having inclined lower edges, a fixed inclined hopper floor member presenting with such cross-bearers an inclined discharge opening, a door hinged to the underside of the inclined floor member in close proximity to the edge thereof, and adapted when closed to constitute the balance of the hopper floor and to overlap the inclined lower edges of the cross-bearers, an angular flange portion formed on the hinged end of the door and adapted to overlap and come into flat contact with the underside of the fixed floor member, and means for operating the said door.

12. In a dump car the frame whereof presents a flanged diagonal discharge opening, a door flanged at the rear edge and both side edges only, leaving the front edge unobstructed, and hinged to the frame at a point beneath the lower edge of the opening so that when closed it will be inclined upwardly from its hinged lower edge and in a position to present upwardly projecting portions at all sides overlapping the flanged edges of the opening.

13. In a dump car, the frame whereof
presents a flanged discharge opening, a door
flanged at the rear edge and both side edges
only, leaving the front edge unobstructed,
5 and the door when closed being inclined up-
wardly from its flanged lower rear edge in
order that when so closed it will be in a po-
sition to present upwardly projecting por-
tions at all sides overlapping the flanged
10 edges of the opening.

In testimony whereof, I have signed my
name to this specification, in the presence
of two subscribing witnesses.

HENRY HAGUE VAUGHAN.

Witnesses:

J. W. NAUGHT,
LESLIE DRAKE.