No. 831,649. PATENTED SEPT. 25, 1906.

E. I. DODDS.

HOPPER CAR.

APPLICATION FILED JULY 24, 1905.

4 SHEETS—SHEET 1.

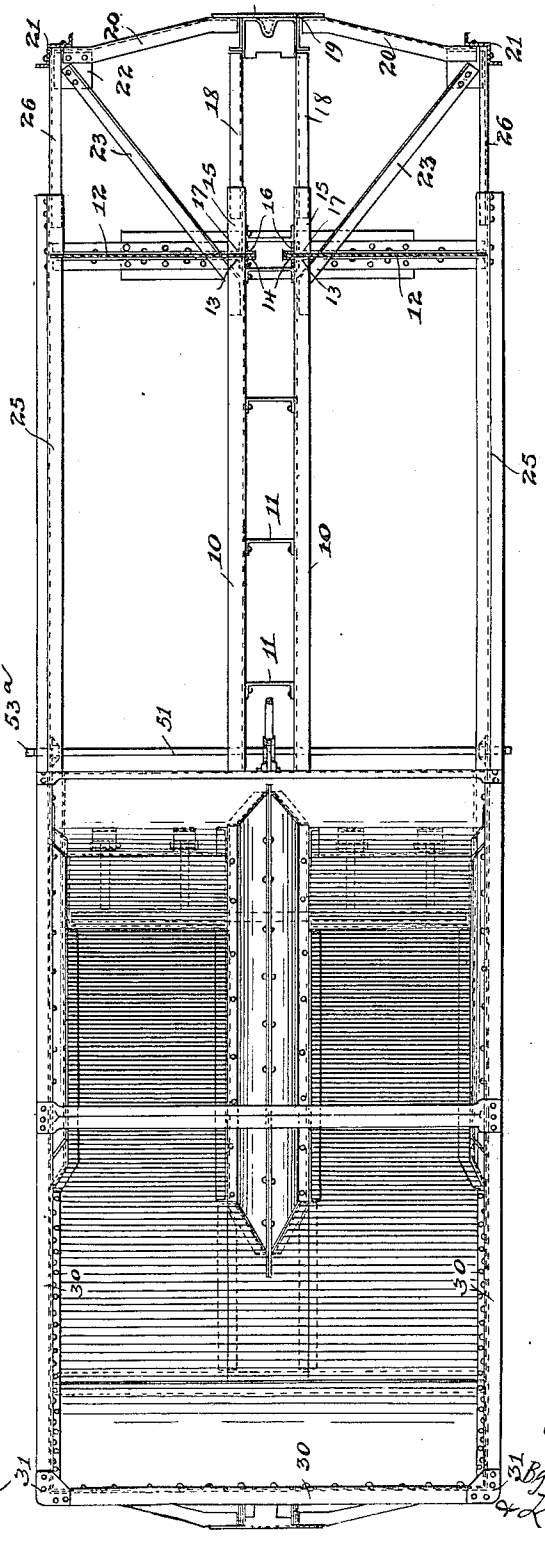


Fig. 1.

Witnesses,
E. S. Mann
Walter M. Fuller

Inventor,
Ethan I. Dodds
By Offield, Towle & Lythicum Attys.

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4 SHEETS—SHEET 2.

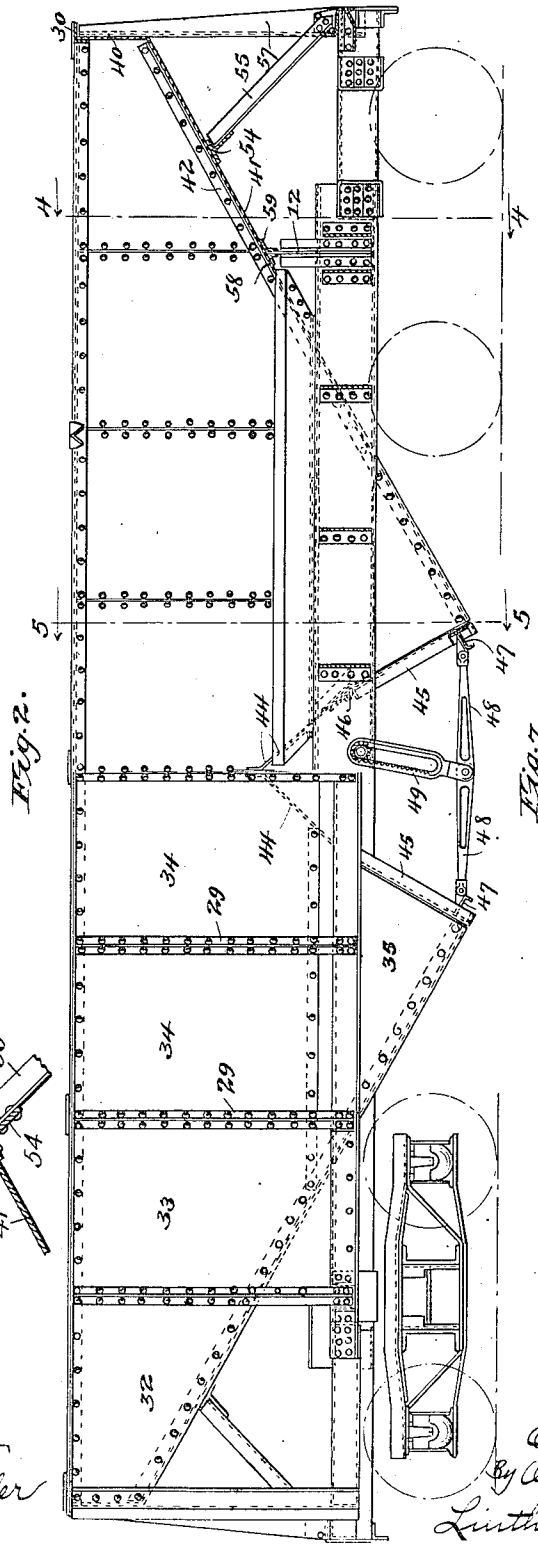


Fig. 2.

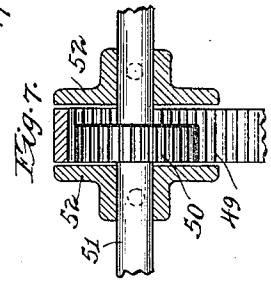


Fig. 7.

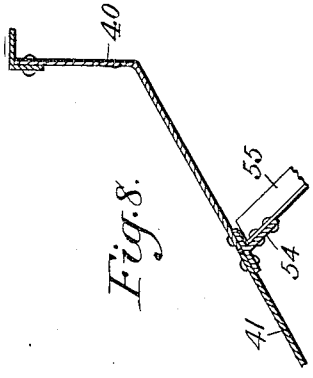


Fig. 8.

Witnesses,
D. D. Mann,
Walter M. Fuller

Inventor,
Ethan I. Dodds
By Offield, Towle & Linthicum
Attys.

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4 SHEETS—SHEET 3.

Fig. 3.

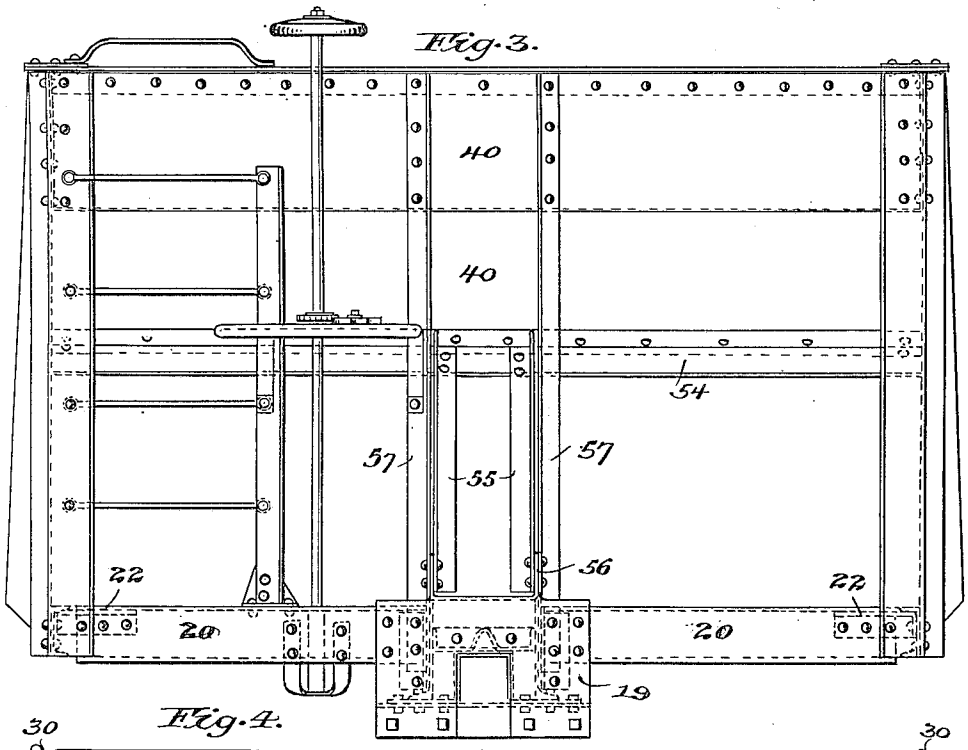
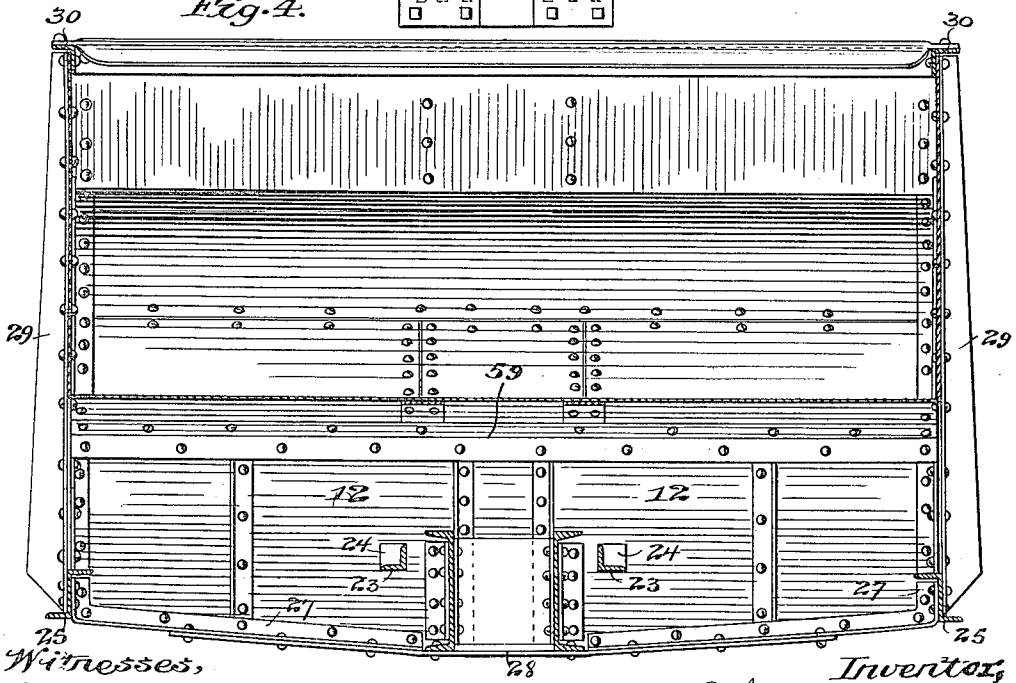


Fig. 4.



Witnesses,

L. S. Mann

Walter M. Fuller

Inventor,

Ethan I. Dodds

By Offield, Towle & Linthicum

Attys.

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4 SHEETS—SHEET 4.

Fig. 5.

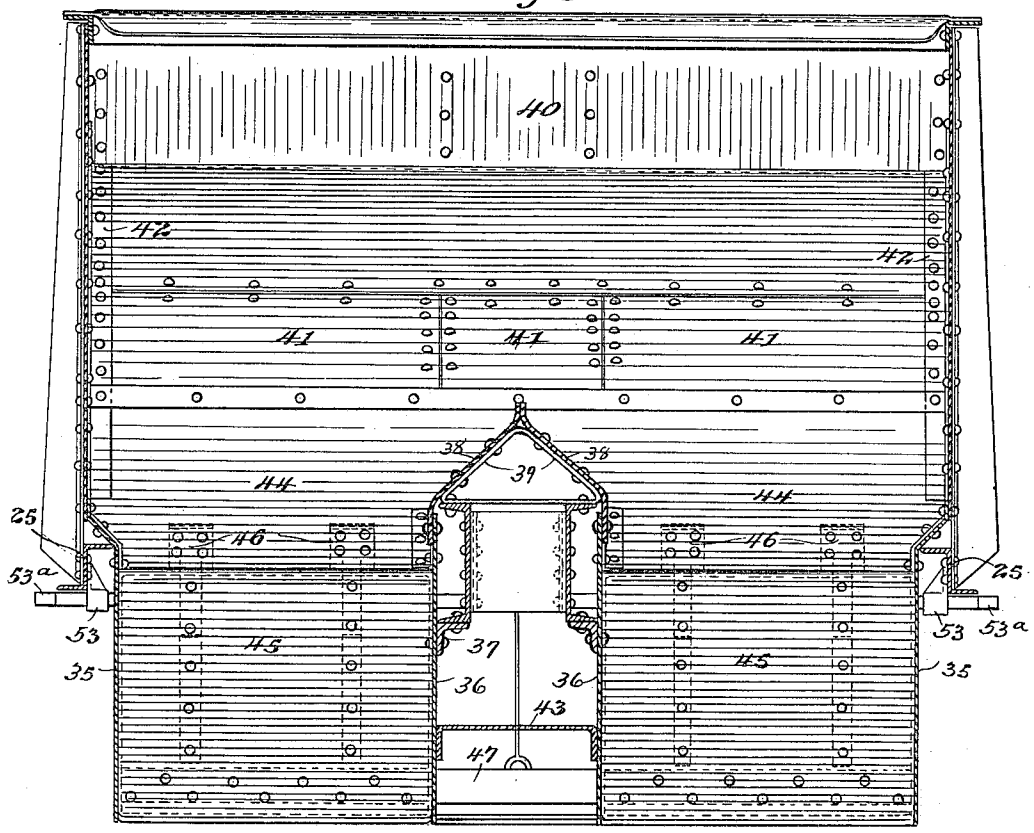
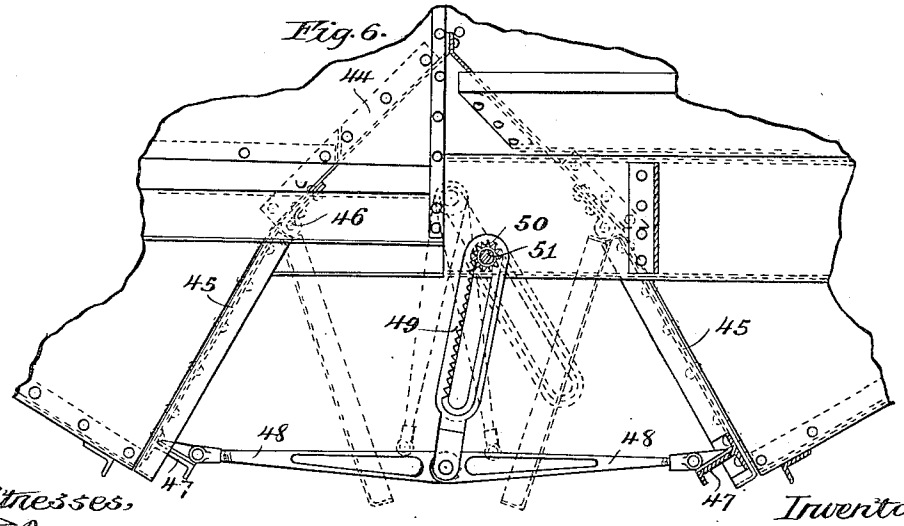


Fig. 6.



Witnesses,
F. S. Mann,
Walter M. Fuller

Inventor,
Ethan I. Dodds
By Offield, Towle & Linthicum
Attys.

UNITED STATES PATENT OFFICE.

ETHAN I. DODDS, OF PULLMAN, ILLINOIS, ASSIGNOR TO THE PULLMAN COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

HOPPER-CAR.

No. 831,649. Specification of Letters Patent. Patented Sept. 25, 1906.

Application filed July 24, 1905. Serial No. 270,996.

To all whom it may concern:

Be it known that I, ETHAN I. DODDS, a citizen of the United States, residing at Pullman, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hopper-Cars, of which the following is a specification.

To improve the construction of hopper-cars, I have invented a novel means for operating the load-discharging doors, an improved sheet-metal construction for the car-body, a new and valuable structure for supporting the body of the car, and a strong form of underframe. The actuating means for the doors comprises a simple and conveniently-located mechanism for positively and easily opening and closing the doors.

The improvement in the car-body, besides other features, involves an integral metal sheet to form the end plate of the car and also a portion of the sloping bottom, the adjoining sheet being spliced thereto by a butt-strap; and the supporting-frame for the body of the car includes a new style of a corner-beam and means for supporting the sloping bottom of the body. The underframe has been strengthened and modified by the use of a diagonal brace passing through the body-bolster.

I have illustrated one embodiment of my invention in the accompanying drawings, wherein—

Figure 1 is a partial plan view and a partial sectional view showing the underframe of the car. Fig. 2 is a partial side elevation and a partial longitudinal central section. Fig. 3 is an end view of the car. Fig. 4 is a section on the line 4 4 of Fig. 2. Fig. 5 is a section on the line 5 5 of Fig. 2. Fig. 6 is a detailed view, partly in elevation and partly in section, of the door-operating mechanism. Fig. 7 is a detailed view showing the deflecting-plates and their support and also the collars which hold the gear and rack together, and Fig. 8 is a fragmentary sectional view of a portion of the inclined bottom of the car.

The center sill of the car comprises two channel-beams 10 10, with their webs inwardly turned and spaced apart by the short transverse channel-sections 11. The outer ends of these beams are secured, by means of angle-plates 13 and 14, to one side of a series of plates 12, which constitute the main portion of the body-bolster. To the other side of the plates 12 are secured channel-sections 15 similar to the sections 10 by means of the angles 16 and 17. The draft-sills 18 are riveted at their outer ends to the face-plate 19 and at their inner ends to the channel members 15. Channel-beams 20 constitute the end sills and are riveted to laterally-projecting portions of the face-plate 19, to corner-posts 21, and to gusset-plates 22, which are also riveted to the corner-posts. These corner-posts are constructed by longitudinally bending the web of a channel-bar to an angle of ninety degrees, the construction being clearly shown in Fig. 1. Diagonal angle-braces 23 pass through slots 24 in the plates 12 and are secured at their inner ends to the center sills 12 and at their outer ends to the gusset-plates 22. Z-beams 25 are used as side sills, being connected to the corner-bars and gusset-plates by channel-sections 26.

Compression angle-bars 27 are riveted to the lower edges of the bolster-plates 12 and at their outer ends are upwardly turned, these ends being riveted to the Z-beam side sills and to the flanges of the side stakes 29. A compression-plate 28 is secured to the flanges of the compression-bars 27 and acts as a strengthening means. Coping angle-bars 30 extend along the sides and end of the car and are provided at their corners with gusset-plates 31. The side plates of the car include the end side plates 32, which are fastened at their tops and sides to the coping angle-bar, the corner-beam, and the side stake, the lower edges of the plates being sloping, as shown in Fig. 2. The adjacent side plates 33 extend the whole distance from the coping angle-iron to the side sill and are riveted to each of these parts. The intermediate side plates 34 do not extend to the side sills, but are cut off, as shown in Figs. 2 and 5, the additional side plates 35 forming portions of the lower hopper parts of the car. The plates 35 are bent inwardly, as is shown in Fig. 5, to escape the side sills and are riveted at their upper ends to the side plates 34 and also to the flanges of the side stakes. The inner plates 36, Figs. 5 and 7, of these lower hopper portions of the car are riveted at their upper ends to the depending portions of the deflecting-plates 38, which are held above the upper flanges of the center sills by their triangular supports 39. The parts 36 are also fastened, by means of angle-bars 37,

to the lower flanges of the center sills. The plates 36 are spaced and held firmly in place by the separator 43, which is riveted thereto.

The ends of the car are constituted by plates 40, Figs. 2, 3, and 5, which are turned inwardly to form portions of the sloping bottoms of the car, the remainder of the sloping bottoms being formed by one or more plates 41. The sloping floors of the car are fastened at their edges to the sides of the car by angle-bars 42. The plate 40 is secured to the plate or plates 41 by means of a butt-strap 54, which has an outstanding flange. (Shown in Figs. 2 and 3.) Diagonal angle-braces 55 are riveted to this outstanding flange and to upturned ears on the face-plate 19. Angle-supports 57 are also riveted to these ears and to the end of the car and end coping. The cross bearer-plates 12 are fastened to the sloping floor of the car by means of the angle-bars 58 and 59, Figs. 2 and 4.

In the center portions of the car and extending transversely thereto I provide deflecting-plates 44, Figs. 2 and 6, which have secured to their lower ends pivoted doors 45, hinged at 46. These doors are connected at their lower ends by means of a transverse beam 47 and are actuated by links 48, which are pivoted at their outer ends to the beams 47 and at their inner ends to a slotted rack 49, the two links 48 forming a toggle. A shaft 51 extends transversely of the car and is supported in the bearings 53, Fig. 5, which are riveted to the inside of the webs of the Z-beam side sills. The outer ends of the shaft are squared, as at 53^a, so that the shaft may be turned by means of a wrench or other implement. A gear 51 is connected to the central portion of the shaft and meshes with the teeth of the rack 49, the shaft passing through the slot of the rack. Collars 52, secured to the shaft on either side of the gear 51 and rack 49, Fig. 7, confine said gear against lateral displacement from the rack.

The operating mechanism for the doors is actuated by turning the shaft, the gear operating the rack, as is shown in the dotted lines in Fig. 6, to cause the doors to turn on their pivots by means of the links 48. The doors can be positively closed by turning the shaft in the opposite direction. It will be observed that by my improved construction I secure besides other advantages an easily-operated, yet positively actuated, mechanism for controlling the opening and closing of the load-discharging doors and also a lighter supporting structure for the ends of the body of the car than has been usual.

Various changes can be made in the construction of the car without departing from the spirit and substance of the invention defined by the following claims.

This patent is intended to embrace only so much of the disclosure made herein as is covered by the claims.

I claim—

1. In a car-frame, the combination of a slotted body-bolster, a center sill, a corner-plate, and a brace connecting said sill and plate passing through the slot of said bolster, substantially as described.

2. In a car-frame, the combination of a body-bolster having a slotted web, a center sill, a corner-plate, and a diagonal brace connecting said sill and plate passing through said slotted web, substantially as described.

3. In a hopper-car, the combination of two plates forming portions of the inclined bottom of the body of the car, a butt-strap splicing said plates together, and a brace riveted to said butt-strap, substantially as described.

4. In a hopper-car, the combination of two plates forming portions of the inclined bottom of the car-body, a butt-strap splicing said plates together, a face-plate, and a brace connecting said face-plate and butt-strap, substantially as described.

5. In a hopper-car, the combination of two plates forming portions of the inclined bottom of the car-body, a flanged butt-strap splicing said plates together, a flanged face-plate, and a brace riveted to the flanges of the butt-strap and face-plate, substantially as described.

6. In a hopper-car, the combination of plates forming portions of the inclined bottom of the car-body, a butt-strap T-shaped in cross-section splicing said plates together, a flanged face-plate, and an angle-brace riveted to the outwardly-extended flange of the butt-strap and to the flange of the face-plate, substantially as described.

7. In a hopper-car, a corner-support for the body of the bar comprising a channel-beam whose web has been bent longitudinally to form an angle at ninety degrees, substantially as described.

8. In a door-operating mechanism for a car, the combination of a shaft, a slotted rack, the shaft extending through the slot of the rack, a gear on said shaft meshing with the teeth of the rack, and a link connecting said rack and door, substantially as described.

ETHAN I. DODDS.

Witnesses:
FREDERICK C. GOODWIN,
WALTER M. FULLER.