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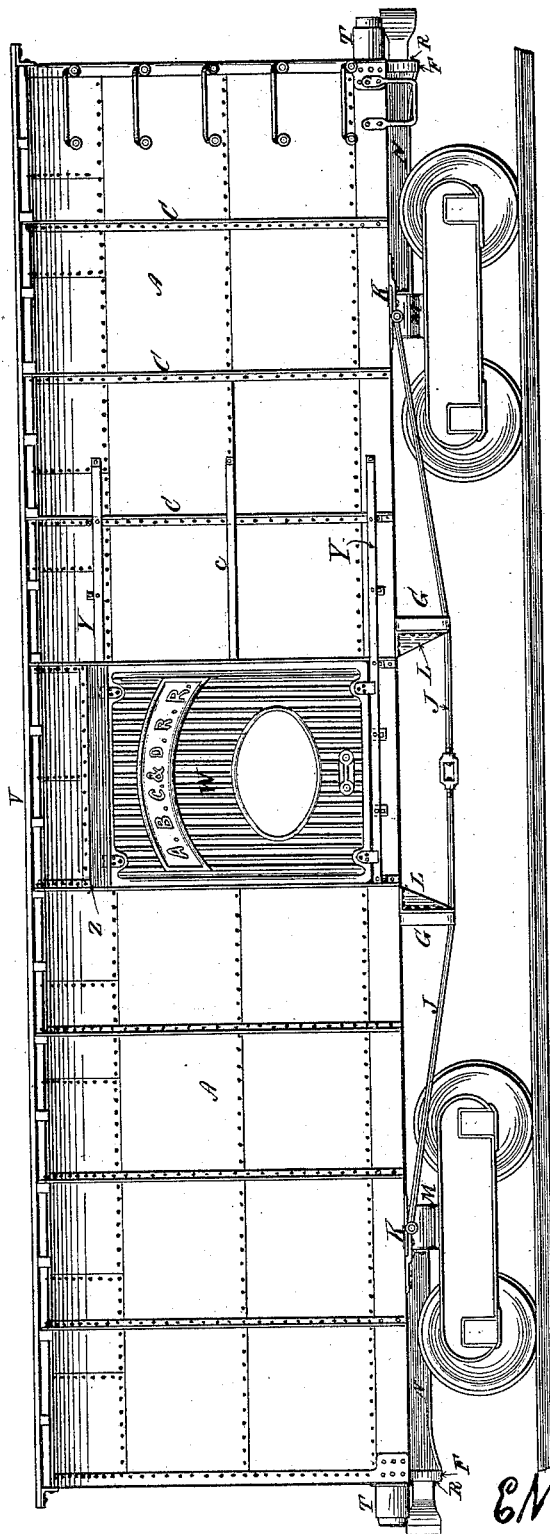
7 Sheets—Sheet 1.

E. W. M. HUGHES.  
METALLIC RAILWAY CAR.

No. 417,786.

Patented Dec. 24, 1889.

Fig. 1.



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By his Attorney,  
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(No Model.)

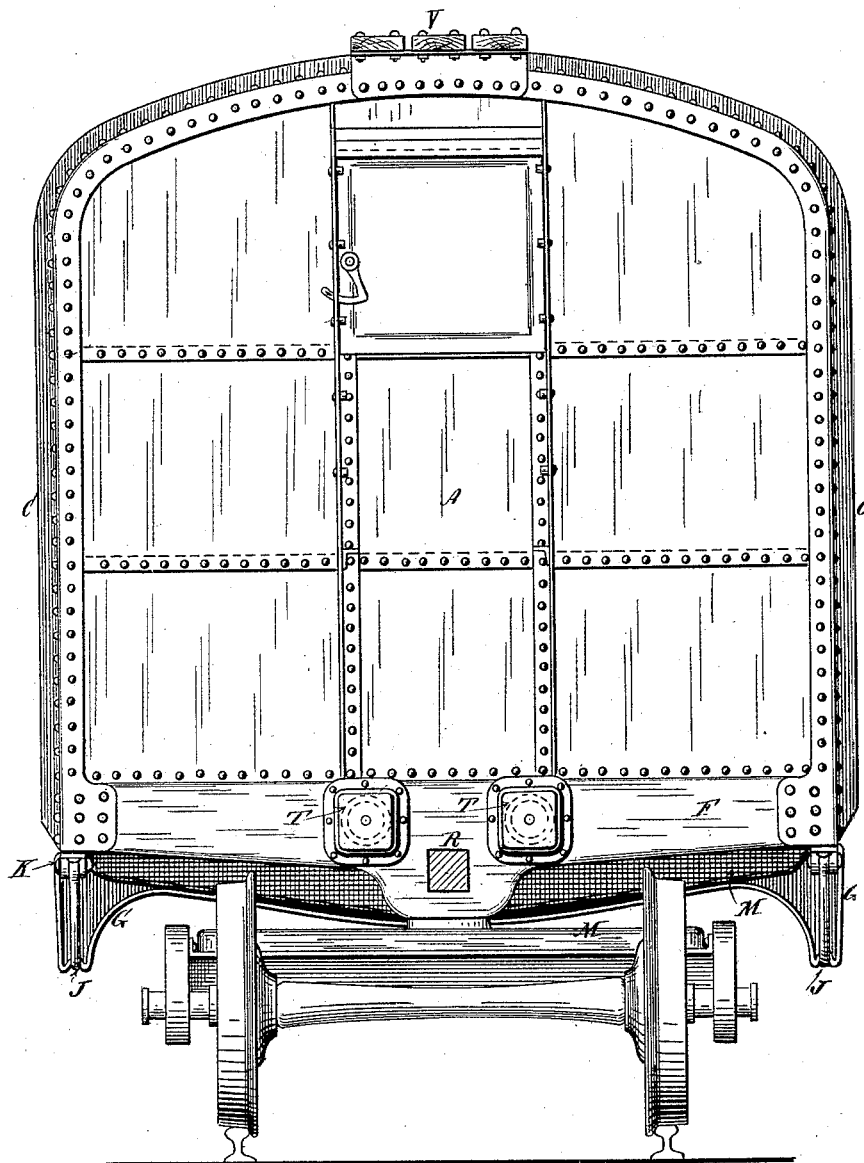
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*Fig. 2.*



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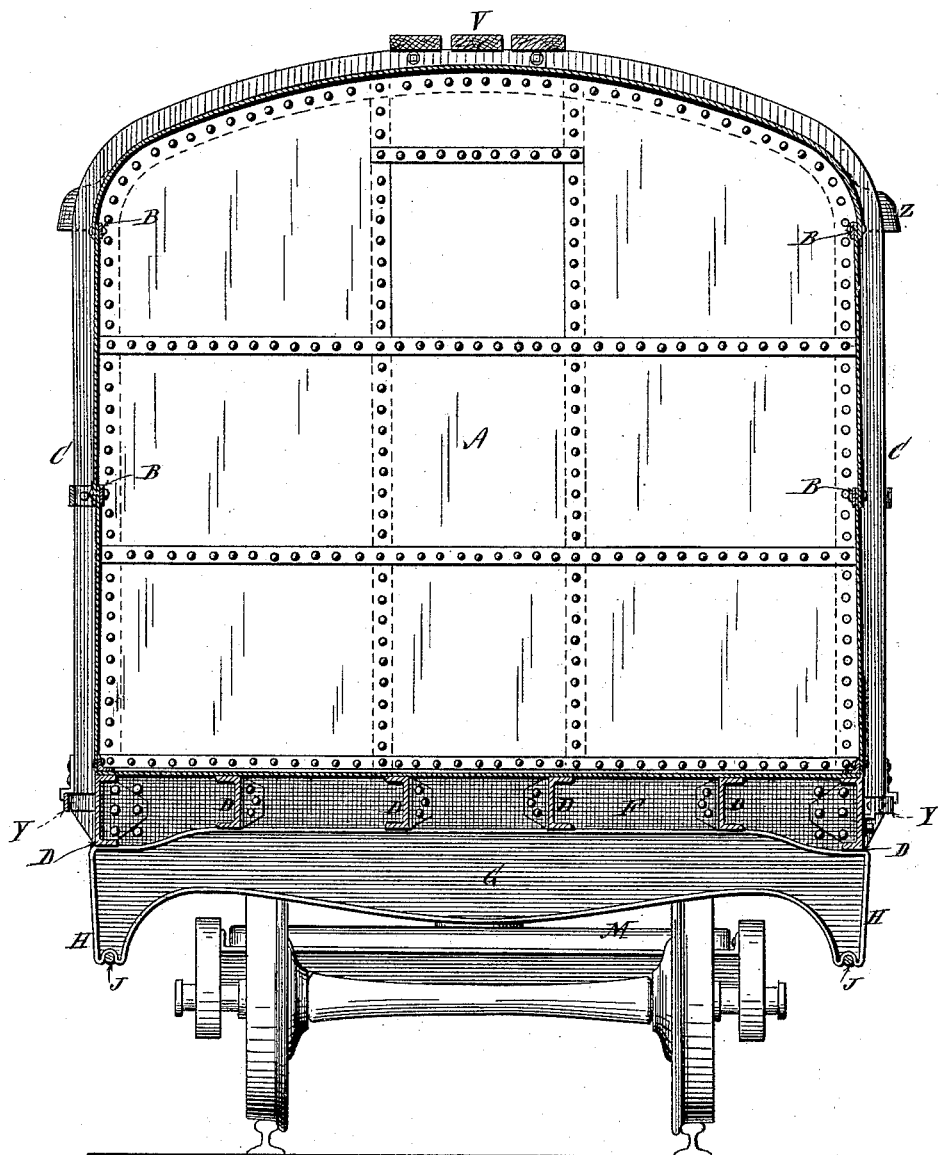
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*Fig. 3.*



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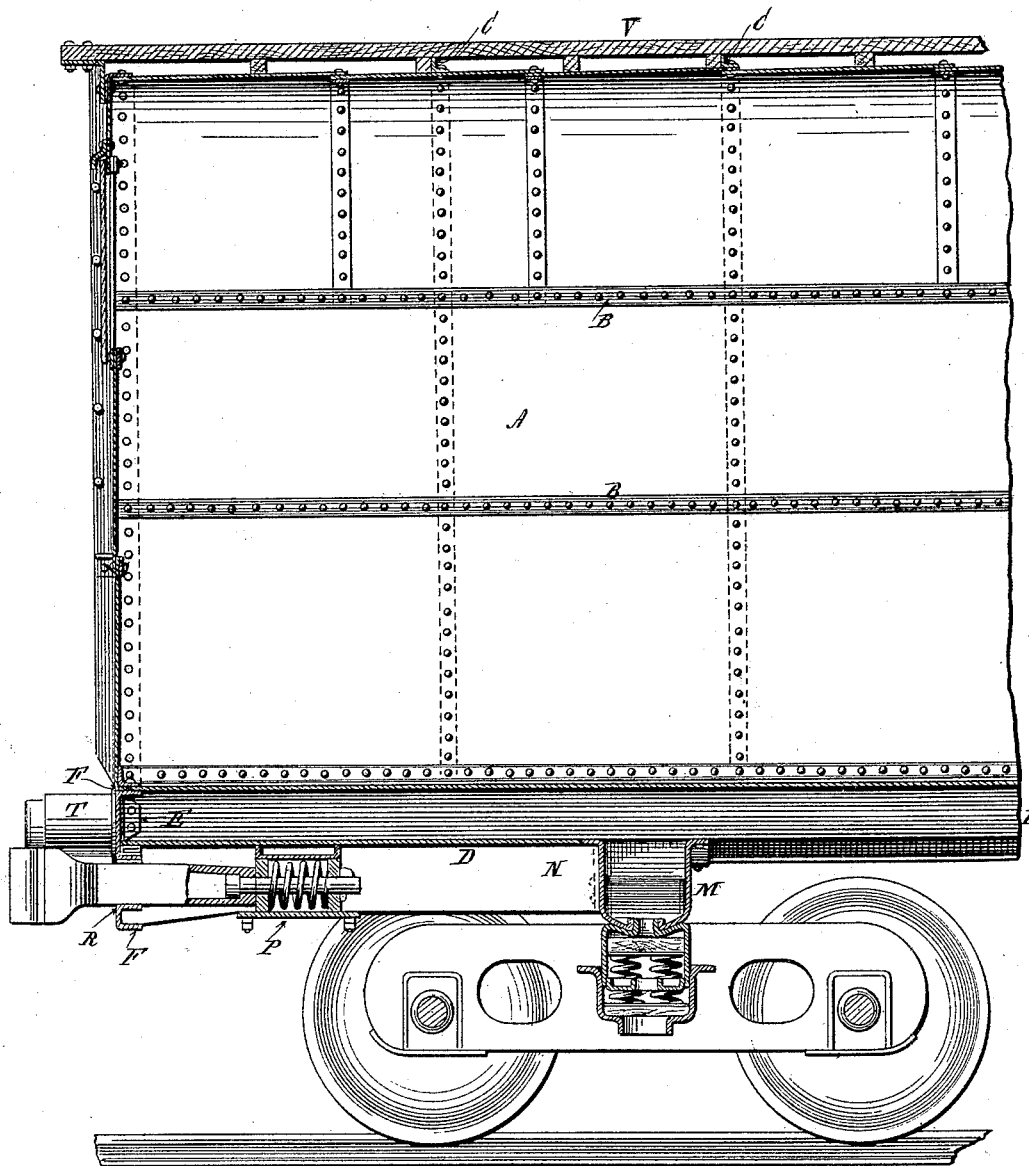
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Patented Dec. 24, 1889.

*Fig. 4.*



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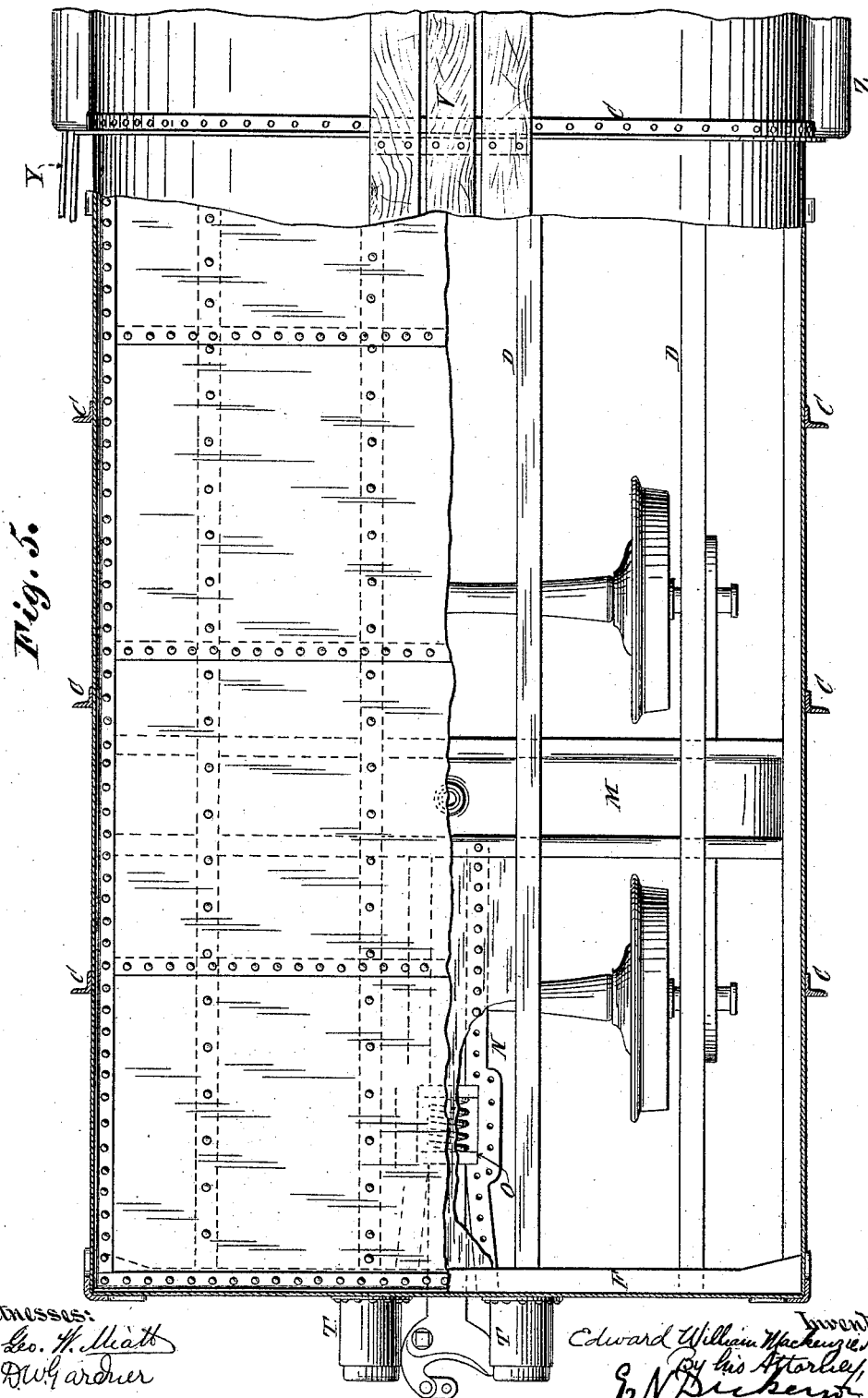
(No Model.)

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E. W. M. HUGHES.  
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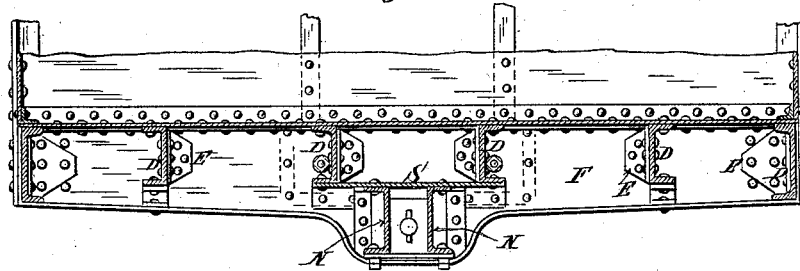
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E. W. M. HUGHES.  
METALLIC RAILWAY CAR.

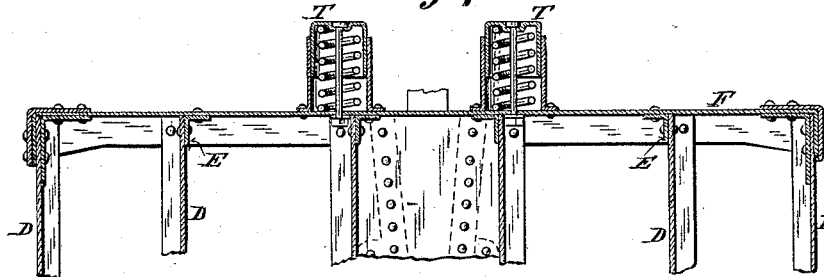
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*Fig. 6.*



*Fig. 7.*



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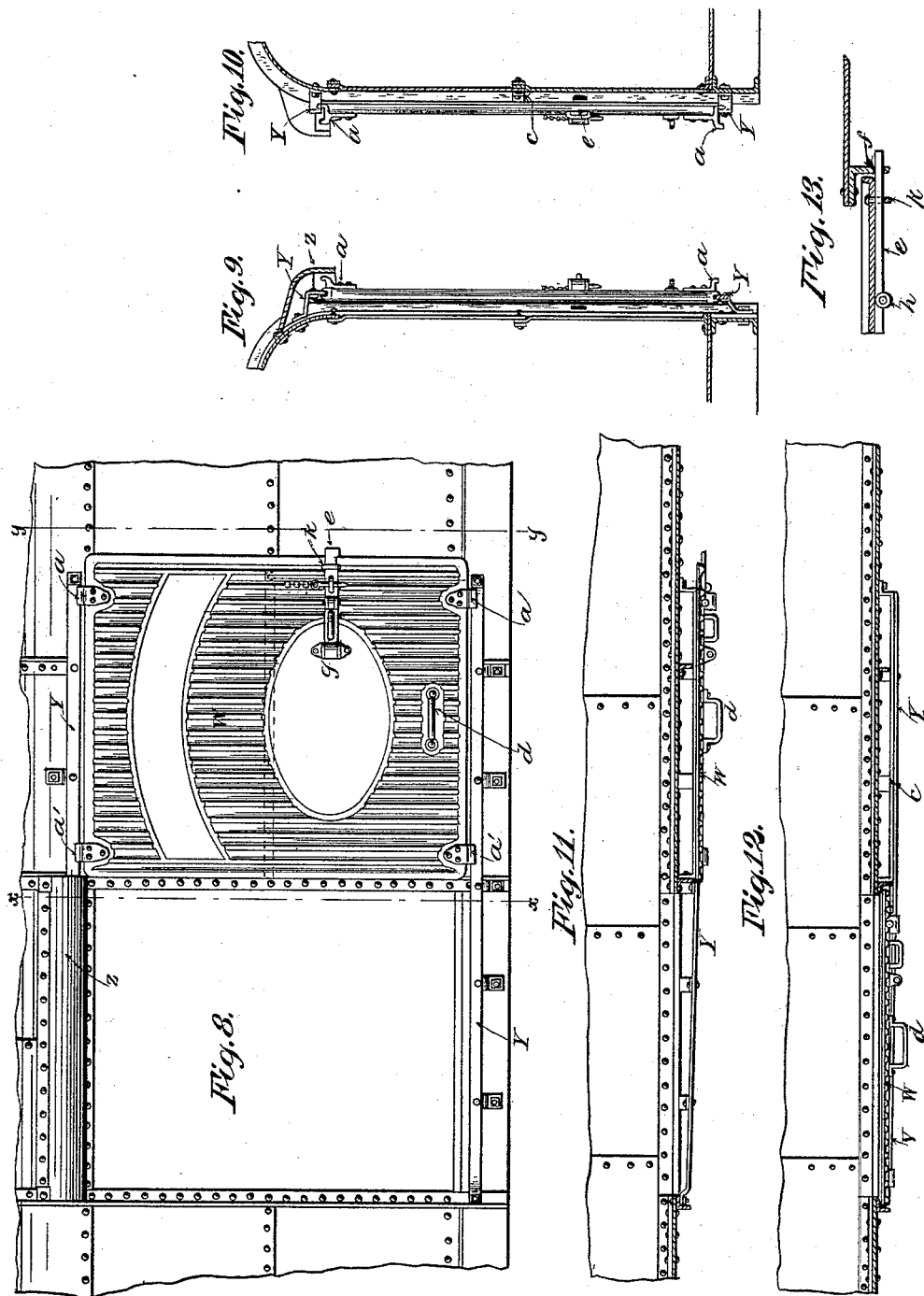
(No Model.)

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No. 417,786.

Patented Dec. 24, 1889.



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# UNITED STATES PATENT OFFICE.

EDWARD WILLIAM MACKENZIE HUGHES, OF CHICAGO, ILLINOIS, ASSIGNOR  
TO THE FOX SOLID PRESSED STEEL COMPANY, OF SAME PLACE.

## METALLIC RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 417,786, dated December 24, 1889.

Application filed May 21, 1889. Serial No. 311,593. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD WILLIAM MACKENZIE HUGHES, of Chicago, Cook county, Illinois, have invented a new and useful Improvement in Metallic-Car Construction, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

This invention relates to an improvement in the construction of metallic railroad-cars, by which the same can be more economically constructed and in which the resulting car is lighter than those heretofore constructed. The car is constructed in the main of sheet-steel supported upon body-bolsters of pressed steel.

My invention will be readily understood from the accompanying drawings, in which—

Figure 1 represents a longitudinalelevation; Fig. 2, an end view of the completed structure; Fig. 3, a transverse section showing the inside of the end of the car; Fig. 4, a longitudinal section of one end of the car, showing the draft-bar and method of supporting the car on the truck; Fig. 5, a floor plan, partly broken away to show the running-gear; Fig. 6, a sectional detail of the bottom of the end of the car; Fig. 7, a longitudinal section showing the buffers. Fig. 8 represents a vertical elevation showing details of the door; Fig. 9, a cross-section through Fig. 8 on the line  $x x$ ; Fig. 10, a cross-section through Fig. 8 on the line  $y y$ ; Fig. 11, a plan view, partly in section, showing the door open; Fig. 12, the same view showing the door closed, and Fig. 13 a horizontal cross-section through the locking mechanism.

A represents, generally, the body of the car, which has the general shape shown in section in Fig. 3. It is made of plates riveted together, as shown. The side plates are flat, while the roof-plates are pressed to a curve, as shown. The plates of the sides and the ends of the car are lapped and riveted through an inside strip B. The carlings or supports for the sides and roof are shown at C, and are preferably made of a single piece carried from the side sills over the top of the car, as shown in Fig. 3. These carlings may be of angle-steel

riveted to the plates beneath. They are attached to the side sills by brackets, or in any suitable way.

The sills of the car D are made of channel-steel, and are attached at their ends by knee-pieces E to the end sills F.

The cross-ties G are made of pressed steel of the shape clearly indicated in Fig. 3, and are shaped at the ends into descending brackets H, serving as king-posts or supports for the body truss-rods J, which are supported by the hinged connection from the side sills at K, as shown in Fig. 1. These cross-ties may be braced by gusset-plates L, as shown in Fig. 1, and upon these cross-ties G the longitudinal sills rest, as clearly shown in Fig. 3.

The body-bolster M is made of pressed steel, and preferably has a center plate pressed therein in accordance with the application for Letters Patent heretofore filed by me on the 26th day of March, 1889, Serial No. 304,851.

The structure of the bolster, transom, and truck may be of any form desired. The draw-bar is attached to the body-bolster by plates N N, which are preferably flanged and riveted to the body-bolster. They are bent to form recesses upon their facing sides, as shown at O, to receive the box for the draw-head, and are closed below the draw-head by perforated plate P, as shown in Fig. 4. The end sill, which is made of pressed steel, has a projection and an opening at R for the passage of the draw-head. The draft-plates N are preferably attached at their upper ends to a plate S, riveted to the bottom of the center sills, as shown in Fig. 6.

The buffers T are made of pressed-steel boxes fitting within surrounding cylinders riveted to the end plates, as shown in Fig. 7. They are, of course, provided with an interior spring, and their motion is limited by a longitudinal bolt.

A running plank V may be provided on top of the car, and is intended to be the only wooden part of the structure, although an additional wooden roof may be employed.

The floor of the car consists of plates of metal riveted together, serving to brace and support the end sills and longitudinal sills.



The structure is shown as applied to a freight-car; but it is in part applicable to passenger-cars.

5 The structure of the door of the car is shown in Figs. 1, 8, 9, 10, 11, 12, and 13, the door itself *W*, of pressed steel, corrugated, and travels upon the rails *Y*, fastened to the side of the car or the carlings, and the door itself is provided with guides or travelers *a a'* upon 10 the upper and lower ends. It may also be provided with a drip plate or cover *Z*, to shed the water when the door is closed. The rails *Y* approach the car more closely at one end than at the other, as clearly shown in Figs. 11 15 and 12. The guides *a* do not fit the rails closely, but allow of lateral play or movement, as clearly indicated in Fig. 10, whereas the guides *a'* fit the rails *Y Y* with reasonable accuracy. An intermediate guide *c* likewise 20 carries the door *W* away from the side of the car, so as to clear it of the vertical carling *C*, as clearly shown. The door is likewise provided with a handle *d*, by which it may be operated. When the door is closed by sliding 25 along the rails, the free end, or the end carrying the lock, is closed in against the car by reason of the play in the guides *a*. It may then be locked by placing the latch *e* in the staple or slotted plate *f*. This bolt is hinged 30 at *g* and likewise at *h*, so that it can be drawn back through the staple *k* and then shot forward into position through the plate *f*, which holds the door firmly locked. In opening the door the bolt *e* is first withdrawn; then, by 35 seizing the handle *d*, the lock end of the door can be drawn outward, so as to be slid past the carlings into the position shown in Fig. 8.

40 I do not claim herein the specific form of door shown, having made application therefor on the 18th day of July, 1889, Serial No. 317,859.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An end sill for cars, made of pressed steel and in one piece, and having an opening 45 therethrough for the passage of the draw-bar, and a flange for the support of the car, substantially as described.

2. The body-bolster herein shown, consisting of a pressed-steel box having outwardly- 50 projecting flanges, in combination with the flanged longitudinal sills of the car, the flanges of the bolster being attached to the flanges of the longitudinal sills, substantially as described.

3. The pressed-steel cross-tie herein shown, made of one piece, and having the projections at the ends serving as king-posts for the truss-rods, substantially as described. 55

4. In the draft-connection for railroad-cars, 60 the combination of the body-bolster and the longitudinal plates *N*, attached thereto and bent to form recesses *O* on their facing sides for the reception of the attaching mechanism on the inner ends of the draw-bar, substantially 65 as described.

5. In a draft mechanism for cars, the longitudinal plates *N N*, and bent to form recesses *O* on their facing sides, in combination 70 with blocks fitting said recesses and with which the draw-bar is connected, substantially as described.

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

EDWARD WILLIAM MACKENZIE HUGHES.

Witnesses:

W. S. HARTWELL,

WM. VOSS.