

(No Model.)

2 Sheets—Sheet 1.

H. C. HODGES.
CAR CONSTRUCTION.

No. 468,176.

Patented Feb. 2, 1892.

Fig. 1.

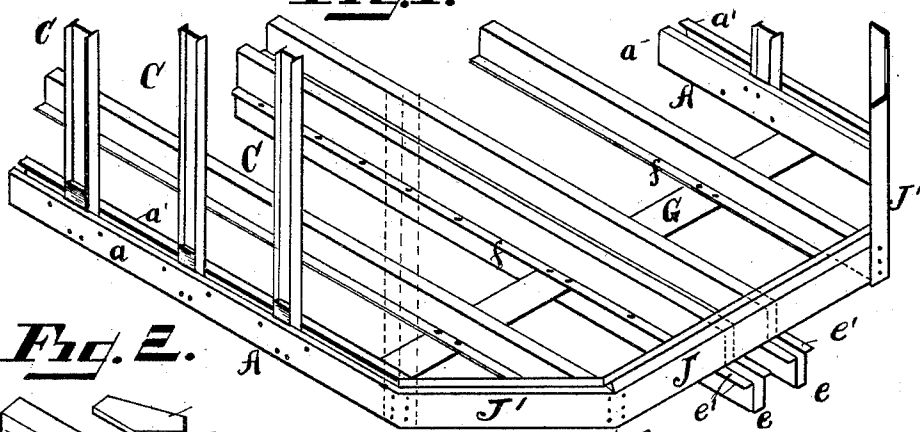


Fig. 2.

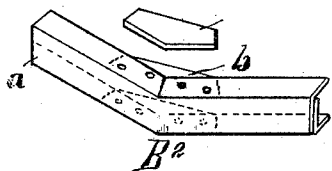


Fig. 3.

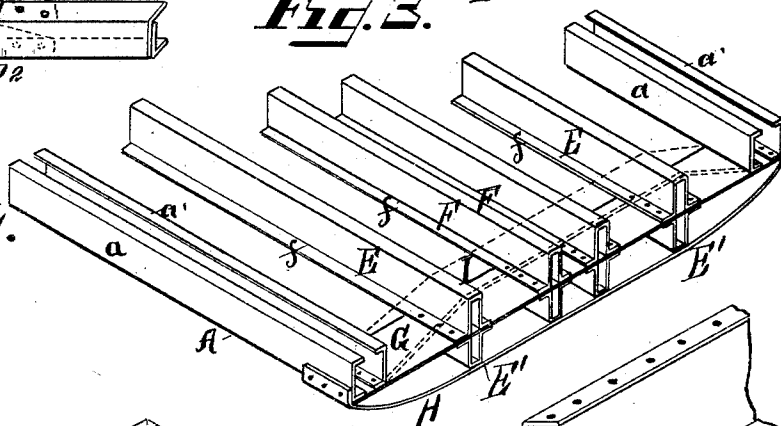


Fig. 4.

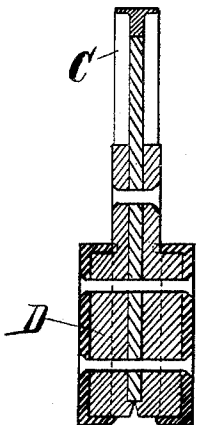


Fig. 5.

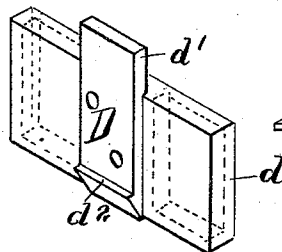
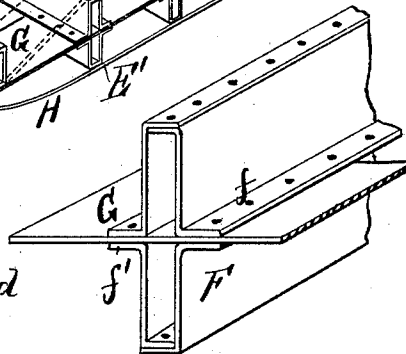


Fig. 6.



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INVENTOR
Henry C. Hodges
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his Attorneys.

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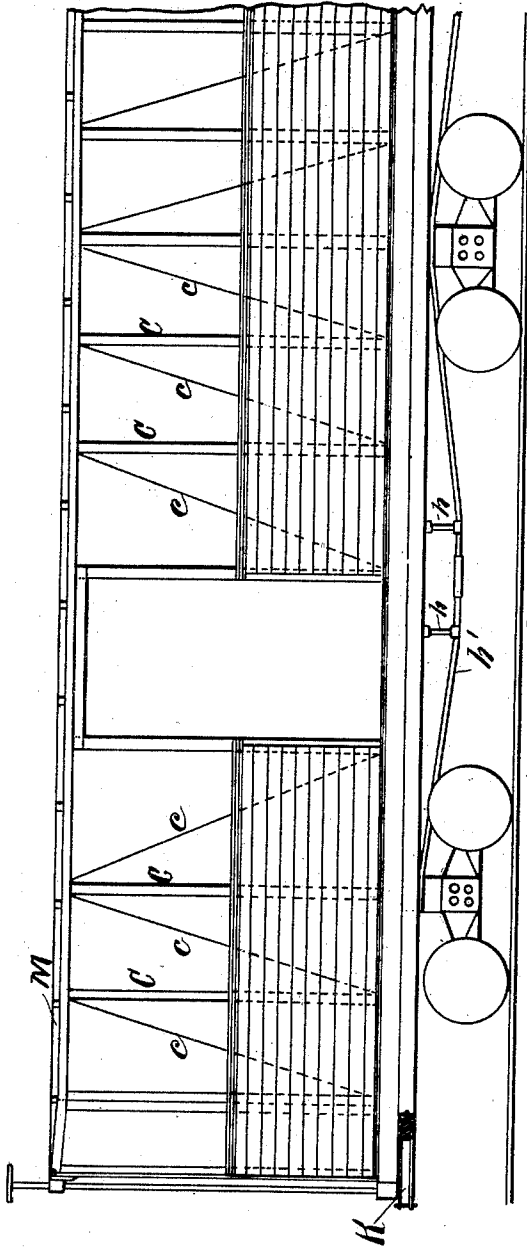


Fig. 7.

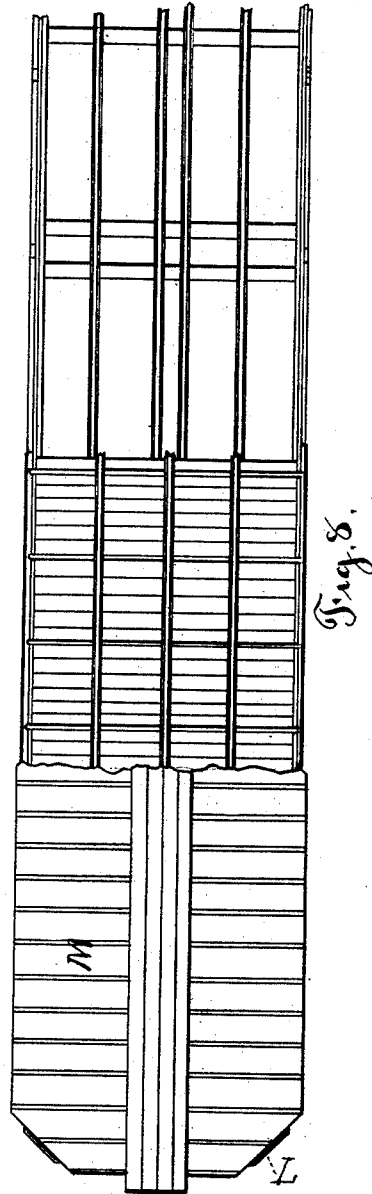


Fig. 8.

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UNITED STATES PATENT OFFICE.

HENRY C. HODGES, OF DETROIT, MICHIGAN.

CAR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 468,176, dated February 2, 1892.

Application filed August 28, 1891. Serial No. 403,958. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. HODGES, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Car Construction; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention has for its object the construction of cars and similar structures where great length of frame is required and where the entire structure must be supported on few points; also, where destructive strains are brought about not only by a proper motion or draft in hauling, but by concussion of sudden stopping or collision.

The requirements of modern commerce make it necessary to employ cars of large carrying capacity, of great strength, and of considerable weight. It is desirable that capacity and strength be increased without a corresponding increase in weight.

The only practical way to increase the capacity of a railway-car is to build it longer, as both width and height must conform to adopted standards. When, however, the car is lengthened, the frame must be strengthened without a corresponding increase in weight. I attain this result by the use of a frame-work constructed in accordance with the following specifications, and illustrated in the accompanying drawings.

Figure 1 shows one end of a floor-frame, showing sills and the manner of connecting studding to the sills. Fig. 2 shows a corner detail. Fig. 3 shows a cross-tie and brace detail. Fig. 4 shows in section the fastening of a stud to the side sill. Fig. 5 shows a connecting-fillet. Fig. 6 shows in detail the fastening of the cross-tie to the middle sills. Fig. 7 is a sectional elevation of a portion of a car, the figure representing two of the three trucks upon which the car rides. Fig. 8 is a plan view showing at different parts of the figure the roof, the roof-frame, the floor-sills, and continuous draw-bar.

This car-frame, as shown, is made entirely

of metal, of shapes easily rolled, and, in fact, commonly found on sale.

A represents the side sill made of two channel-bars $a a'$, placed with their concave faces toward each other. One or both of these may, if preferred, be made of an I-beam; but for readiness in turning corners, as appears hereinafter, the channel-bars are preferable.

B² represents a corner and shows the manner of turning an angle with the side sill without breaking or cutting the beam. To make this corner, I cut a gore from the flange or flanges of the channel or angle bars a , bend the bottom of the channel to the required angle, and strengthen with a fillet b . By using angles formed in this way the entire outside sill, including cross-sills at the ends and both side sills, may be made continuous of the two members $a a'$, or the outer member may be made continuous and the inner member placed only along the side sill. I prefer the latter construction, because I thus employ the cavity in the end or cross-sills within which to secure the ends of intermediate sills.

C C are studs of I or channel iron fastened to the side sills by bolts and a fillet D. The fillet D is made of peculiar form to fill the channels of both the sill and the stud, and for that purpose is made in the form of a cross, of which one arm is sunk slightly within the other, as though mortised into it. The upper side of the channel-bar a has a gain cut in it, within which is received the part of the upright lying behind the outer face of the horizontal arm d . The lower side of the channel-bar a is not provided with a gain and the end of the upright rests on the side of the channel-bar. On the obverse side of the arm d' is a step d^2 , upon which rests the lower end of the stud C. It will be seen that when the joint is completed, as shown in Fig. 4, each part has a bearing directly against another part, and the bolts holding the parts together are relieved from all shearing strain.

E E (the sills adjacent to the side sills) are compound channel-bars formed by two angle or Z bars together, the channel or concave side being placed downward. At points where the cross-ties G, hereinafter described, cross them there is bolted to each bar a support or standard E' E', serving as a compression mem-

ber to act as a support resting on the cross-brace H.

F F represent the middle sills. These are also composite beams made of angle-iron, channel-iron, or bars rolled into Z shape, arranged to form two flanged channel-beams, with the flanges of one opposite to the flanges on the assembled compound beam, are rectangular in form, with a middle flange on either side extending from end to end.

G is a cross-tie plate passing between the members of the upper half of the beam E and those on the lower half, the flanges *ff* coming above the tie-plate and the flanges *f'* coming below the tie-plate.

It is not necessary that all of the sills E E F F be made of metal, as any or all of them or the parts of the compound sills may be constructed of wood.

H is a brace-plate bolted to the side sills and passing under the inner sills and forming with the tie-plate G and the sills E E F F a truss across the car-bottom, serving to cause each one of the sills to be sustained by all the others and to distribute the load. I is a similar brace-plate passing from the side sills over the middle sills.

F F (the two middle sills) have their under halves *ee*, Fig. 1, extended under and beyond the end cross-sill J, and between them is attached a draw-head K. The two middle sills thus form a draw-bar continuous from end to end of the car, and so connected to the framework as to form a part of the car itself. The dead-woods or bumpers may be bolted to the upper sides of the flanges *e' e'*, and any blow received against the bumpers will be resisted by that part of the frame best calculated to withstand it. The upper halves of the sills E E F F are received within the channel of the end cross-sill and are bolted to it either with or without an included fillet.

Instead of making the corners of this car rectangular, I make the end bayed, preferably making the car a long octagon, having two long sides, two ends, each about four feet long, and four corner-faces, each about or a little less than three feet. With this construction the meeting faces or ends of the cars extend only two feet (more or less) from the coupling-pin to the part where they begin to widen out, and the liability of accident to the train-men in coupling cars is greatly reduced and the car is strengthened. On the corner-face of each car I place the rounds of a ladder L, which the train-man may grasp and by which he can sustain himself if threatened from any cause.

c c c are tie-rods passing from the side sills to the roof-plate and forming with the studs, sills, and roof-plate a number of truss structures along the side walls of the car, there being one such truss over each truck.

Hanging tie-rods *h h* and a truss-rod *h'* support the inner ends of the side trusses just described.

Upon the side walls rests a roof of corrugated iron or other suitable material.

In the construction of this car of iron beams in the way described each joint can be easily packed with felt or paper or other non-conducting material, the parts being so firmly held together that such packing will not be destroyed by any slight motion of one part upon another. At the same time the interposed packing will effectually prevent any creaking, straining, or rattling noise. It will be noticed that throughout the structure there is kept in view constantly the dispersal or scattering of forces, both of draft and of concussion. The dead-wood bolted to *ee* serves to receive and transmit to the middle sills, to the cross-sill J, and through that and the bracing angle-sills J' J' the force of a push or stroke. It also serves when the car is pulled from the other end to scatter the force of draft in the same way, and the bracing or arched form of the ends of the floor-frame by dividing the force among a number of resisting members decrease the liability to injury from either draft or concussion strain. In passenger-cars the doors may be placed in the corners and the side trussing carried through below the windows.

M represents the roof of corrugated metal or any other suitable material. The siding is also of corrugated metal or wood or other suitable material. Where wood siding is used, a wooden furring is bolted to the sills and the siding nailed to it.

The car-frame thus constructed of metal is light in proportion to the strength, and I am able to increase the capacity very much in proportion to the weight of the car, while at the same time the construction causes the strains of draft or concussion to be met by a practically solid frame.

If desired, any or all of the channels within the beams may be filled with wood or any proper filling material, and, if desired, in place of the side channel bar or bars *a a'* an I-beam having a single vertical web may be used.

I do not wish to be understood as limiting myself to a structure in which the side and end sills are made in a continuous piece, as the spirit of my invention equally applies to a structure in which those sills are made in several parts as well as in a single piece.

What I claim is—

1. A car-frame or other similar structure composed of compound floor-sills tied together by plates passing between the members of the compound middle sills and fastened to the side sills and trussed by cross truss-plates fastened to the side sills and passing under and supporting the middle sills, said compound middle sills being composed of upper and lower members formed of angle or channel iron and made with opposing flanges, substantially as and for the purposes described.

2. In the frame of a car or similar struct-

ure, the combination of a compound beam composed of an upper and a lower member lying parallel to each other, each member being formed of channel-iron and the two members being placed with the concavities opposed, each member being also provided with flanges and the flanges of the two members being opposed, a cross-tie or girder passing between said flanges and secured thereto, substantially as and for the purpose described.

3. In the frame of a car or similar structure, the combination of a compound side sill composed of two channel-bars with their concave faces in opposition, a stud placed between said channel-bars, a joint-iron fitting the interior of the channel-bar, and the stud and bolts securing the parts together, substantially as and for the purposes described.

4. In a car-frame, the combination of the middle sills composed of upper and lower members, each of said members being built up of channel-iron, as described, the said lower members having extended ends *e e*, and the draw-head K, all arranged and combined to form a continuous draw-bar integral with the floor-frame, substantially as and for the purpose described.

5. A joint-fillet for uniting channel-iron, consisting of a metallic cross of two prisms crossing each other and having at their junction a united thickness greater than that of either part, but less than the united thickness of both parts, whereby provision is made to have either part fit into a gain in the flanges of a channel-iron, into the channel of which the other part is placed.

6. A joint-fillet for uniting channel-iron, consisting of a metallic cross of two prisms crossing each other, having at their junction a united thickness greater than that of either part, but less than the united thickness of both, and one of the members being provided with a ledge or step, substantially as and for the purposes described.

7. In combination with a channel-bar, sill, and a stud also provided with a channel, the herein-described joint-fillet, the flange of said sill being provided with a gain to receive the upright member of said joint-fillet, substantially as and for the purpose described.

8. In a car structure, the combination of side sills and end sills meeting at oblique angles, the said end sills being broken in contour, whereby an angled end to the car-frame is formed and the car-floor is octagon-shaped, substantially as and for the purpose described.

9. The combination of a car and a continuous draw-bar made integral with the middle sill of said car, the said middle sill and said draw-bar being formed of compound beams

of angle-iron, with the flanges of said angle-iron on the lower side of said sill opposed to the flanges of angle-iron on the upper side of said draw-bar, substantially as and for the purposes described.

10. In a car structure, a concave-metallic end sill, combined with compound central sills having an upper part received within the concavity of the end sill and a lower part projecting under and beyond, substantially as and for the purpose described.

11. In a car structure, a concaved metallic end sill circular or broken in horizontal contour, adapted to receive within the cavity the ends of the upper part of the central sills, combined with a compound central sill having an upper and a lower part, substantially as and for the purpose described.

12. In a car structure, a lock-joint between sills and studs formed by the combination of a channel-bar sill, a cross-shaped fillet, and a channeled stud, one arm of said cross-shaped fillet resting in the channel of said sill and the cross-arm lying across said sill being notched into the flanges thereof and resting in the channel of said stud.

13. A car-frame or other similar structure composed of compound floor-sills tied together by plates passing between the members of the middle sills and fastened to the side sills trussed by cross truss-plates passing over the middle sills connected to the side sills, substantially as and for the purpose described.

14. In a car structure, a compound metallic end sill, combined with the central sills having the upper part of said central sills received within the cavity of the compound end sill and the two continuous lower parts of the central sills projecting under and beyond, substantially as and for the purpose described.

15. In a car structure, the combination of a compound metallic end sill made integral with the side sills and provided with a channel, and central longitudinal sills engaged within the channel of the end sills and secured thereto by a fillet or joint iron, substantially as and for the purpose described.

16. In a car structure having an octagon-shaped floor, the combination of corner-faces furnishing a recess between the meeting ends of contiguous cars, and a ladder-frame located on said corner-face and within said recess, substantially as and for the purpose described.

In testimony whereof I sign this specification in the presence of two witnesses.

HENRY C. HODGES.

Witnesses:

MARION A. REEVE,
DELL BROWNE.