

No. 871,799.

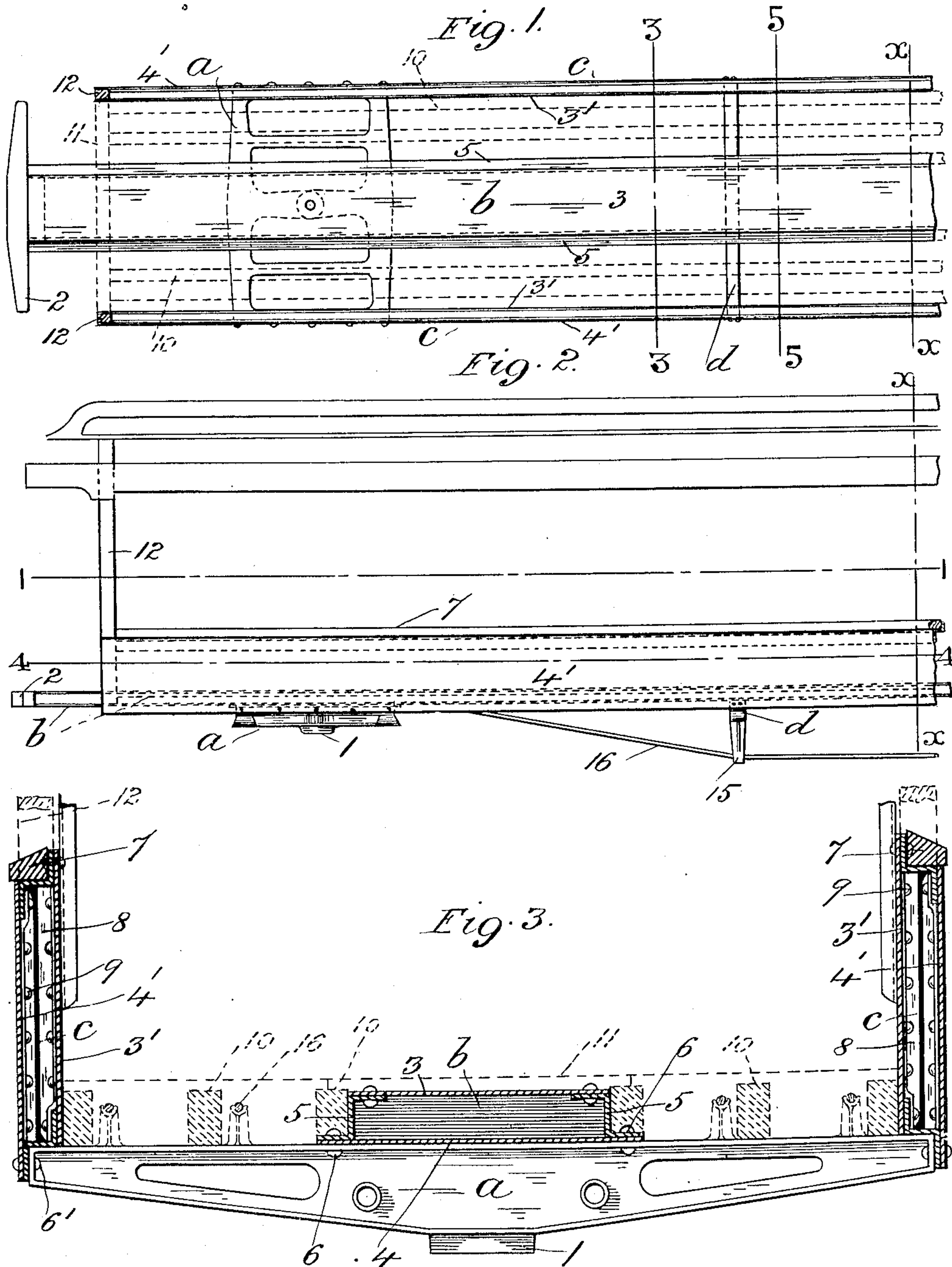
PATENTED NOV. 26, 1907.

C. H. HOWARD & C. T. WESTLAKE.

CAR UNDERFRAME.

APPLICATION FILED AUG. 12, 1907.

2 SHEETS—SHEET 1.



WITNESSES
Wm. H. Hager
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INVENTORS
Clarence H. Howard
Charles T. Westlake
By Edward H. Furrell
their Atty

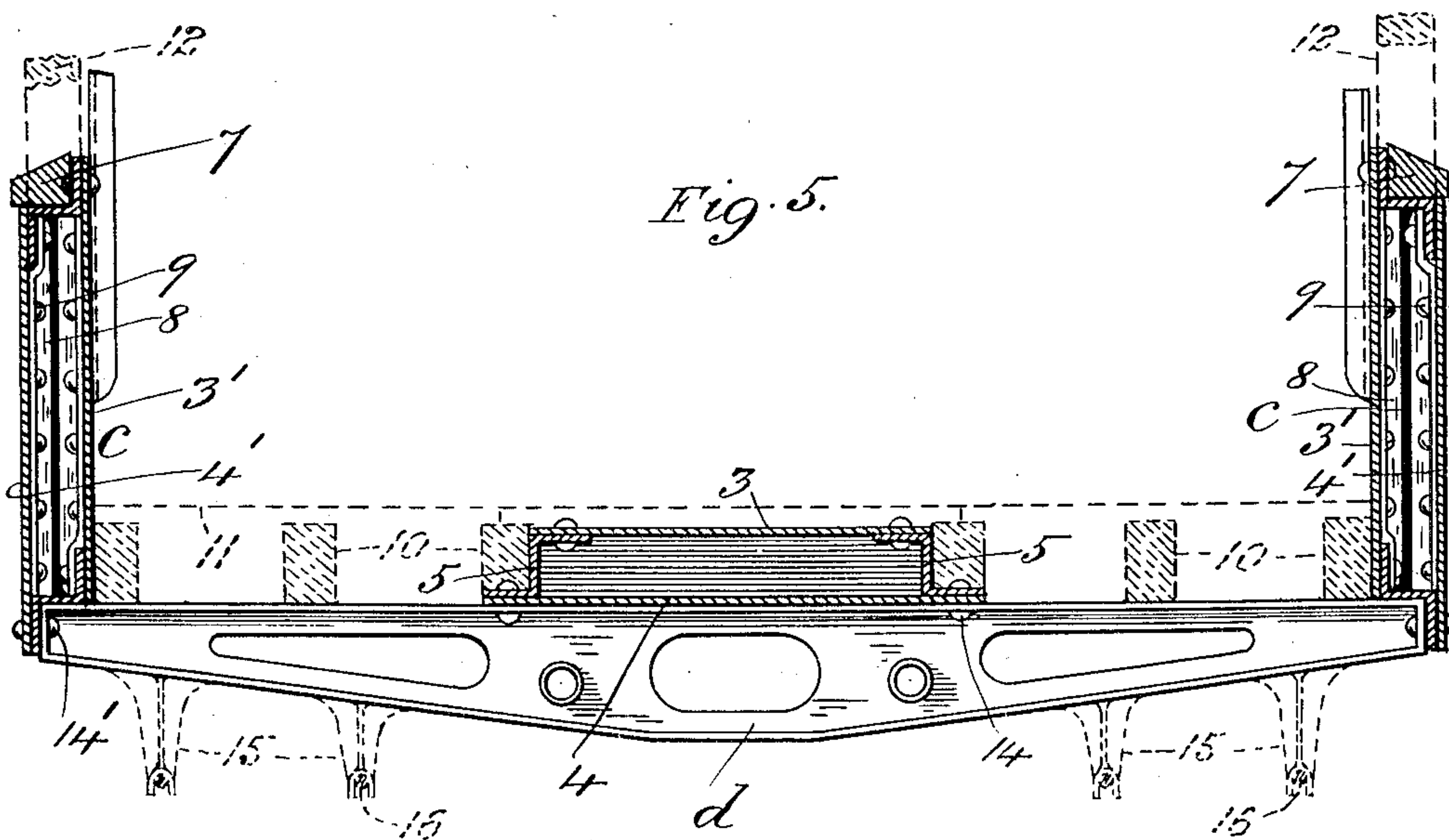
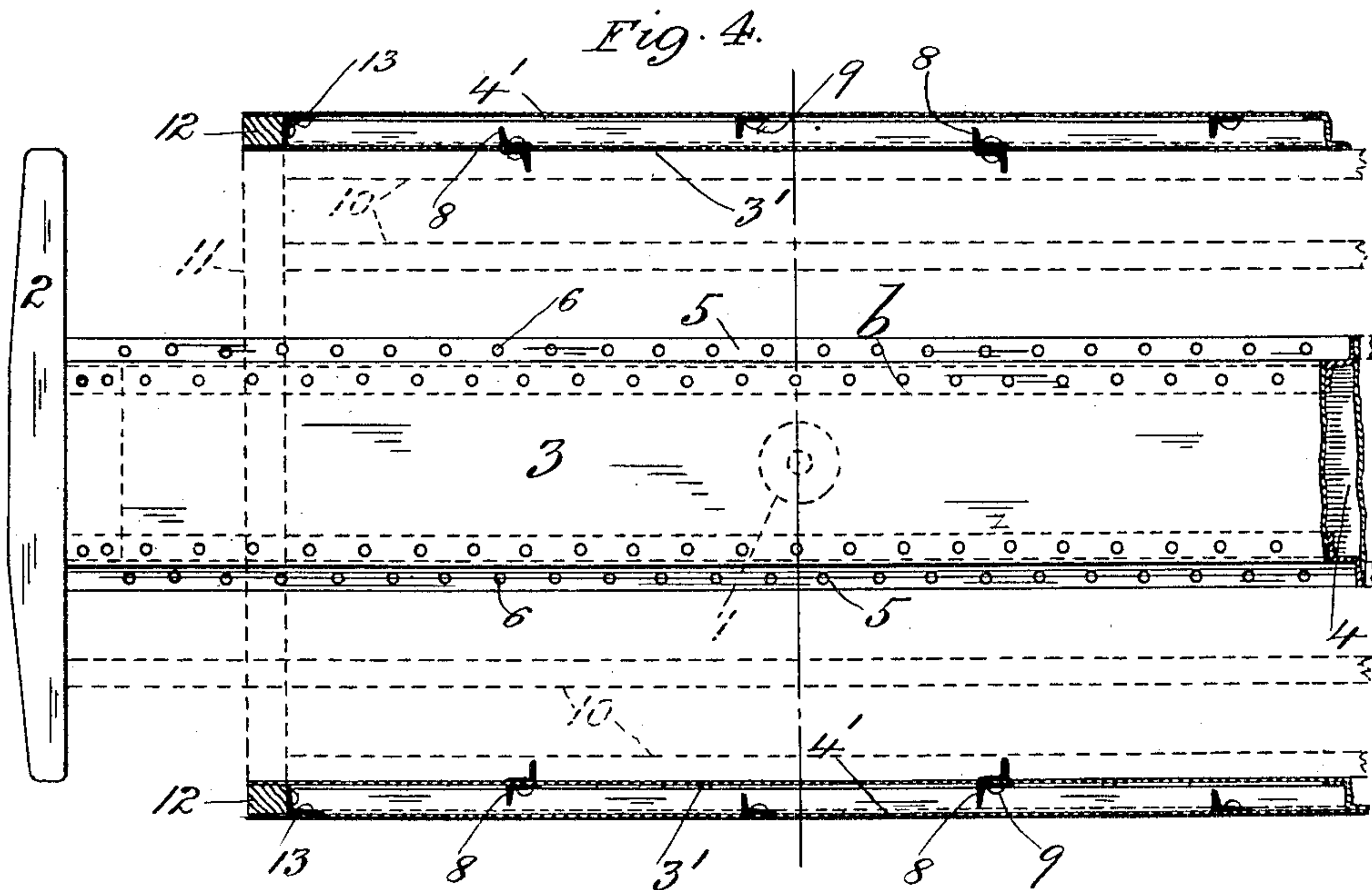
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2 SHEETS—SHEET 2.



WITNESSES
J. M. Flager
W. B. Willis

INVENTORS
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UNITED STATES PATENT OFFICE.

CLARENCE H. HOWARD AND CHARLES T. WESTLAKE, OF ST. LOUIS, MISSOURI, ASSIGNORS
TO CAST STEEL PLATFORM COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF
DELAWARE.

CAR-UNDERFRAME.

No. 871,799.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed August 12, 1907. Serial No. 388,198.

To all whom it may concern:

Be it known that we, CLARENCE H. HOWARD and CHARLES T. WESTLAKE, citizens of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Improvement in Car-Underframes, of which the following is a specification.

Our invention relates particularly to a metallic car underframe, and has for its object to provide a strong, rigid, and durable structure adapted to reinforce the floor and sides of the car-body and thereby increase its resistance to shocks from collision or derailment.

It consists in features of novelty as hereinafter described and claimed, reference being had to the accompanying drawing forming part of this specification, whereon,

Figure 1, is a horizontal section through the corner posts of the car-body on line 1, 1, in Fig. 2, showing our improved underframe in top plan view; Fig. 2, a side elevation of the underframe and combined parts of the car-body, broken away; Fig. 3, a vertical transverse section to enlarged scale through the underframe on line 3, 3, in Fig. 1; Fig. 4, a horizontal section through the same on line 4, 4, in Fig. 2, and Fig. 5, a similar view to Fig. 3, through the underframe on line 5, 5, in Fig. 1.

Like letters and numerals of reference denote like parts in all the figures.

Our improved metallic car underframe (broken away and one-half shown to the left of the middle line *x, x*, of the car, in Figs. 1 and 2,) comprises a body-bolster *a* adjacent to each end of the frame and preferably of the cast steel type integral throughout. Each body-bolster *a* in the present case, is shown as a double body-bolster, preferably I-shaped in cross section, having the body center-plate 1 and perforated centrally for the king-bolt in the usual well-known manner; but the body-bolster may be single, and of any suitable design and shape in cross section.

Arranged longitudinally across and between the body-bolsters *a* at their middle portions is a preferably box-shaped middle longitudinal sill or member *b* which is preferably continuous, of a shallow rectangular shape in cross section and fixed flatwise in the present case, to the top of the bolsters *a*, the sill *b* extending beyond the ends of the car-body and fixed at each end to the corresponding buffer-beam 2 of the platform. Or the middle

sill *b* in lieu of being continuous, may be made in sections extending respectively, between and beyond the bolsters, and fixed thereto in any suitable manner, but we prefer the construction shown.

The middle longitudinal sill or member *b* is preferably composed of a top plate 3, and a bottom plate 4 which bears on the bolsters *a* and is wider than the top plate 3, the plates 3 and 4 being connected together at, and adjacent to their corresponding edges on each side of, and equidistant from the longitudinal center of the underframe by a Z-shaped bar 5, having when assembled, its upper inner flange riveted to the top plate 3, and its lower outer flange to the bottom plate 4, the web of the bar 5 being flush on the outside with the edge of the top plate 3, whereby a wide base is formed to the sill *b* and a double thickness of metal provided thereat for securing the sill *b* to the top of the bolsters *a* by the rivets 6. Similarly, between and across the ends of the body-bolsters *a* at each side of the car-body, is a preferably box-shaped longitudinal girder or member *c* of like construction to the middle longitudinal sill *b*, and arranged flatwise in the plane of the side of the car-body, excepting that the inner and outer plates 3', and 4', of each side girder *c* (corresponding respectively to the top and bottom plates 3, and 4, of the middle sill *b*) are of equal width, the inner plate 3' when assembled, extending upward beyond the outer plate 4', and the outer plate 4' extending downward beyond the inner plate 3', whereby the end and adjacent top portion of each bolster *a* sets in the inner angle formed at the bottom of the girder *c* and is fixed to the outer plate 4' thereat by the rivets 6' through a double thickness of metal.

Each girder *c* preferably extends upward as far as the wood belt-rail 7 which sets in the outer angle formed at the top of the girder *c*, the latter being substituted for the ordinary wood sheathing and other rails and paneling between the belt-rail 7 and side-sill of the underframe. Each girder *c* is preferably strengthened on the inside by angle irons 8 which are fixed vertically by rivets 9 to the plates 3' and 4' alternately as shown.

On the bolsters *a* between the middle sill *b* and side girders *c* are arranged the auxiliary wood longitudinal sills 10 on which the flooring (not shown) is fixed in the ordinary man-

ner, the sills 10 butting endwise against the end cross sills 11 between the corner posts 12 of the car-body, which pass between the inner and outer plates 3', 4', of the side girders *c* to which they are fixed by angles 13, or in any other suitable manner.

d represents one of the needle-beams, which are composed preferably of cast steel, I-shaped in cross section and fixed at the top and ends respectively to the middle sill *b* and side girders *c* by rivets 14 14' in the same manner as the body-bolsters *a*, the needle-beams *d* being made sufficiently rigid for enabling the queen-posts and truss-rods ordinarily used to be dispensed with. But if desired queen-posts 15 may be cast (or fixed) on the needle-beams *d* for the truss-rods 16 as indicated by full lines in Fig. 2 and by dotted lines in Fig. 5.

By our invention as above described, in which a metallic middle longitudinal sill having a broad base and rigid Z-shaped side members extending the entire length of the car between the platform buffer-beams, combined with similarly constructed metallic side girders forming a considerable portion of the car-body, and rigidly fixed therewith to the body-bolsters and needle-beams a very strong structure is produced adapted to resist to the utmost lateral and vertical flexure and telescoping in case of collision or derailment.

It is here noted that we do not limit ourselves to the use of the Z-shaped bars 5 for connecting the plates 3, 4, and 3', 4', respectively, together, as the said plates may be analogously united by bending and flanging, or in any other suitable manner for forming a shallow rectangular box-shaped structure.

What we claim as our invention and desire to secure by Letters Patent is:—

1. A car underframe of the class described, comprising two body-bolsters, a middle longitudinal sill consisting of a shallow rectangular box-shaped girder extending the entire length of and beyond the car-body, and adapted to be fixed flatwise to the said bolsters, a buffer-beam fixed to each end of the said sill, two opposite side longitudinal members consisting respectively, of a rectangular box-shaped girder analogous to the said sill and arranged flatwise in the plane of the side of the said body, the said member being adapted to be fixed to the ends of the said bolsters and to engage the belt-rail of the said body, substantially as described.

2. A car underframe of the class described, comprising two body-bolsters, a middle longitudinal sill consisting of a shallow rectangular box-shaped girder extending the entire length of and beyond the car-body, the said sill having lateral outward bottom flanges and adapted to be fixed flatwise thereat to the said bolsters, a buffer-beam fixed to each end of the said sill, two opposite side longitudinal members consisting respectively, of a rectangular box-shaped girder analogous to the said sill and arranged flatwise in the plane of the side of the said body, the said member having an outward bottom flange and adapted to be fixed thereat to the ends of the said bolsters, and having an inner top flange adapted to engage the belt-rail of the said body, substantially as described.

3. In a car underframe of the class described, the combination with the body-bolsters, of a shallow rectangular box-shaped sill adapted to be fixed flatwise to the said bolsters and consisting of a top plate, a bottom plate of greater width than the top plate, and two opposite Z-shaped bars adapted to connect the said plates together at and adjacent to their corresponding side edges, the said plates and bars extending the entire length of the sill, substantially as described.

4. In a car underframe of the class described, the combination with the body-bolsters, of a shallow rectangular box-shaped sill adapted to be fixed flatwise on the said bolsters and consisting of a top plate, and a bottom plate of greater width than the top plate, the said plates extending the entire length of the sill, and the longitudinal edge portions of the top plate being adapted to form a Z-shape with the body of said plate and fixed thereat to the corresponding edge portions of the bottom plate, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CLARENCE H. HOWARD.

CHARLES T. WESTLAKE.

Witnesses to the signature of Clarence H. Howard:

ARTHUR T. MOREY,

EDWARD W. FURRELL.

Witnesses to the signature of Charles T. Westlake:

N. B. WILLIS,

EDWARD W. FURRELL.