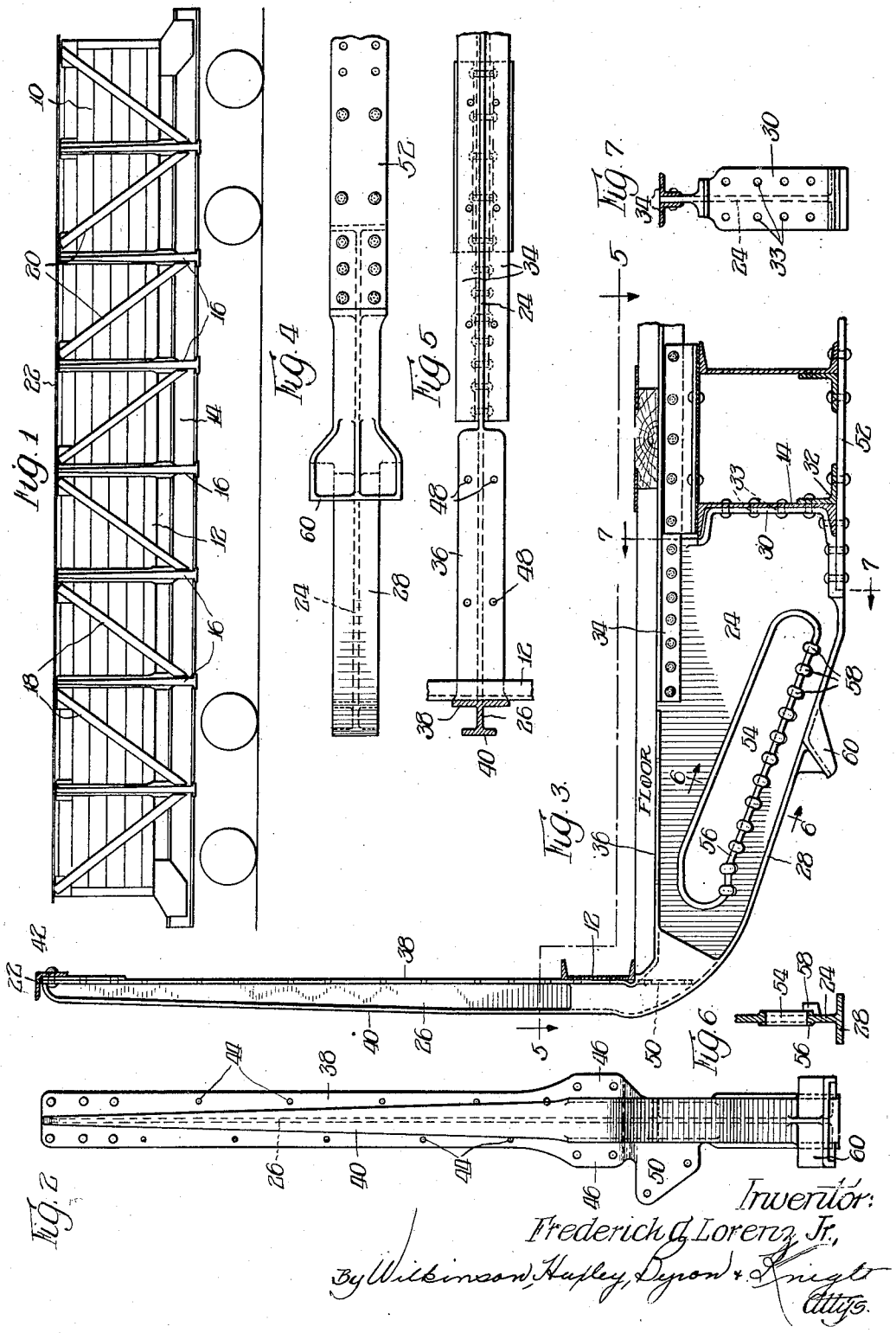
March 3, 1931. F. A. LORENZ, JR 1,794,697

CAR STAKE

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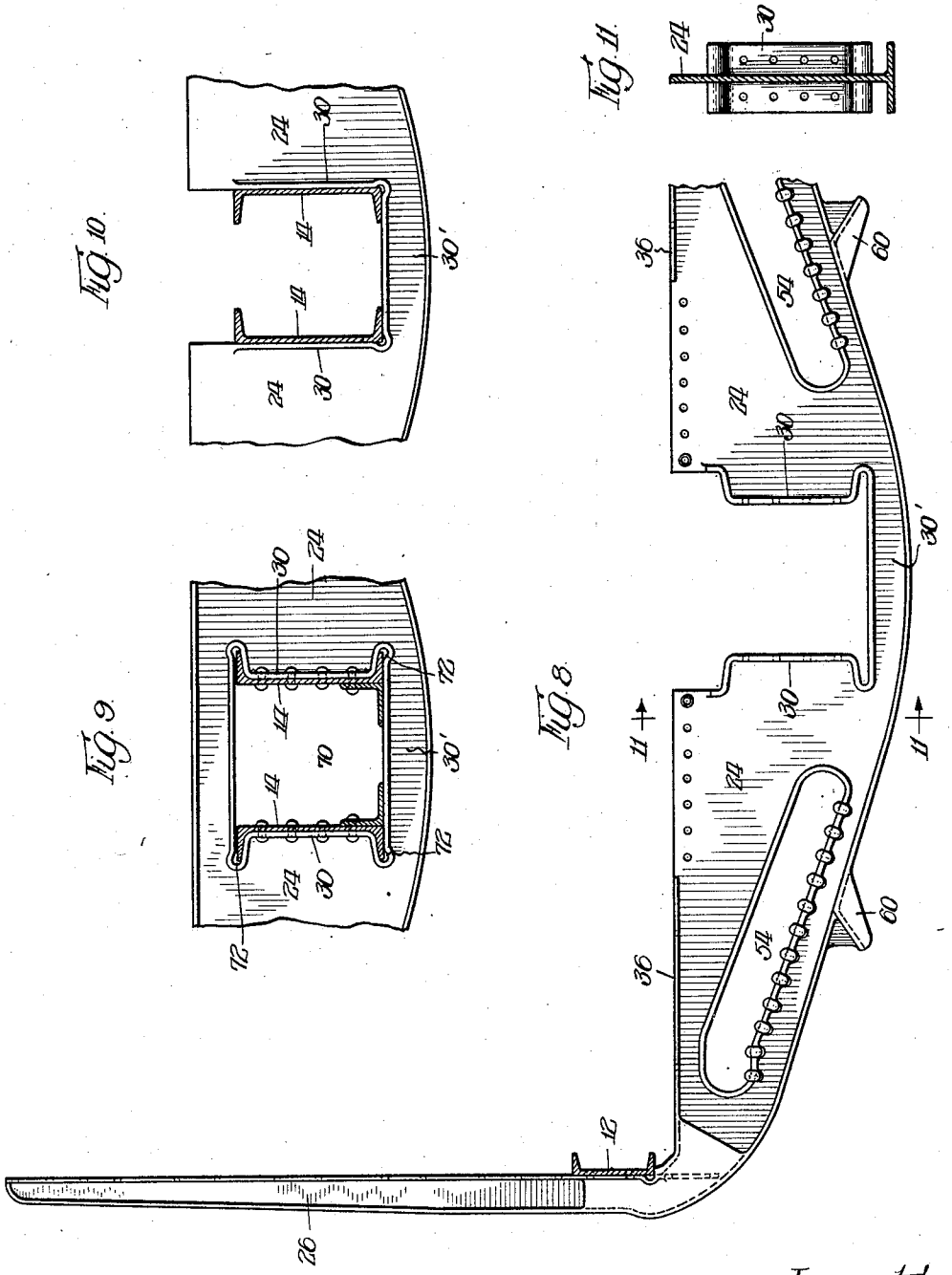


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Patented Mar. 3, 1931 1,794,697

UNITED STATES PATENT OFFICE

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CAR STAKE

Application filed November 2, 1928. Serial No. 316,723.

This invention relates to railway devices and appliances and is illustrated herein as embodied in a reenforcing member for use in connection with gondola cars and cars of other similar types.

A gondola car comprises a boxlike structure having an open top and an under frame for supporting and bracing the bottom and the side walls of the body of the car. The under frame is composed mainly of a plurality of longitudinally extending sills arranged centrally of the car bottom, and a plurality of side sills disposed symmetrically with respect to the center sills and spaced apart from one another by a distance which represents the width of the car. Bearing members are arranged to extend laterally from the center sills to the side sills to support the flooring of the car and in addition it is customary to provide reenforcing members along the outside of the car to hold in place the sideboarding of the walls.

Heretofore, the bearing members, known as cross bearers, have been in the form of metallic plates which extend from one of the center sills outwardly to one of the side sills and terminate at their opposite ends in flanges which are adapted to be secured, by means of bolts, to the side and center sills respectively. The reenforcing members which range along the outside of the car body are known as side stakes and have heretofore comprised elongated members that are riveted at their lower extremities to the side sills of the gondola car, or, in flat cars, are inserted in stake pockets that are riveted to the side sills. Thus, it will be seen that in railway car construction heretofore practiced the cross bearers and side stakes have comprised separate and distinct members independently secured to the under frame of the car.

With the foregoing considerations in view, an important object of the present invention consists in simplifying the construction of railway cars of the gondola type and other similar types through the provision of a novel means for supporting the flooring and side walls of the car.

An important feature of the invention which is conducive to the accomplishment of the recited object consists in the provision of a unitary structural unit comprising both a cross bearer and a side stake. Thus, in the illustrated embodiment of the invention the outer extremity of the cross bearer instead of terminating at the side sill is extended vertically in a direction approximately at right angles to the cross bearer to form a side stake which engages and strengthens the sideboarding of the car. In the use of such a device it may be inserted in the under frame of the car as a unit thereby bringing about a marked degree of simplification in the construction of the cars.

Still another object of the invention consists in the provision of a novel means for supporting the flooring and sideboarding of a car that is simple in design and construction but of increased strength and rigidity. There are many features of the invention which contribute to the accomplishment of this object, one of the most important of which consists in forming the side stake integrally with the cross bearer and also in forming the flanges of the side stake and cross bearer integrally with the body portion of the structure. In the illustrated embodiment of the invention, the cross bearer and side stake is provided with a lateral projection adapted to be connected to a brace which extends diagonally between adjacent cross bearer and side stakes and this projection, as well as the flanges and other reenforcing parts, is integrally formed. To the end of increasing the strength and rigidity of the member the side stake is formed with an inner flange, the cross bearer is formed with an upper flange, and these two flanges are made continuous by a fillet flange, similarly, the car stake is formed with an outer flange, the cross bearer with a lower flange and these parts are made continuous through the provision of an intermediate flange.

In a somewhat different aspect the invention contemplates forming the cross bearer and side stake with integral parts or members adapted to be used in connection with associated mechanism. Thus, when used in connection with railway cars having bottom doors, the cross bearer may be formed with

an opening and with a series of integral projections which may be employed in connection with mechanism for use in opening and closing doors. Also, the cross bearer may conveniently be provided with laterally projecting shoulders or lugs for engaging and supporting the doors of the car when they are opened.

Still another important object of the invention consists in the provision of a combined cross bearer and side stake made in a single casting. To the end of accomplishing this object the combined cross bearer and side stake as illustrated and disclosed herein is designed and constructed in such a manner that it may be conveniently cast by the employment of casting methods in use today. This is an extremely important feature of the invention inasmuch as the cast metal member is immune to corrosion and other deteriorating effects to which pressed steel members are ordinarily subjected.

Other objects, features, and advantages of the invention will become apparent from a reading of the following specification in the light of the accompanying drawings, in which—

Figure 1 shows diagrammatically and in side elevation a railway car of the type commonly known as a gondola car;

Figure 2 is a view in elevation of a cross bearer and side stake for use in holding the sideboarding of the gondola car in place;

Figure 3 is a view in side elevation of the cross bearer and side stake shown in Figure 2;

Figure 4 is a bottom plan view of the cross bearer and side stake shown in Figures 2 and 3;

Figure 5 is a top view of the cross bearer and side stake shown in Figures 2, 3, and 4;

Figure 6 is a view in section taken along the line 6, 6 of Figure 3;

Figure 7 is a view in side elevation of the end of the cross bearer and side stake, taken along the line 7, 7 of Figure 3;

Figure 8 is a view in side elevation similar to Figure 3 of what may be termed a double ended cross bearer and side stake;

Figures 9 and 10 are fragmentary views of double ended stakes showing various manners in which they may be incorporated in the car; and

Figure 11 is a view in section taken along the line 11, 11 of Figure 8.

Turning now to the drawings, there is shown in Figure 1 a railway car of the gondola type which comprises, generally speaking, a rectangular box-like body composed of sideboarding 10. The top of the body is open and the bottom is closed by flooring which may or may not, as desired, be provided with trapdoors. The flooring rests upon a center sill 14, and a plurality of side and end sills 12 extend around the periphery of the floor adjacent to the lower edge of the side walls of the car. This construction is shown in Figure 3 in which there are provided a plurality of center sills 14 which extend in a lengthwise direction centrally of the car bottom, and a plurality of side sills 12 (only one of which is shown) which are located above and on opposite sides of the center sills, and are laterally offset therefrom, the distance between the oppositely disposed side sills representing the width of the car. The flooring extends across the top of the center sills and terminates under the lower edge of the side sills 12 which are illustrated in the form of channel beams.

To the end of holding the sideboarding of the car in place and also in order to brace the side walls of the car so they will effectively resist working strains that are imparted thereto, the car is provided with a plurality of spaced, vertically extending side stakes 16. A suitable number of side stakes range around the outside of the car and perform the function of ordinary reenforcements, adjacent side stakes being joined together by means of diagonally extending braces 18, 20. It will be observed that the braces 18 along one end of the car extend in opposite directions to the braces 20 along the opposite end of the car. A frame 22 composed of angle irons extends continuously around the upper open side of the car and is joined by means of bolts 42 (Figure 3) to the upper extremities of the car stakes 16.

In the construction of cars of the illustrated type, it is necessary to provide members extending widthwise of the car beneath the flooring in order suitably to support the latter, and to this end there are provided a number of frame parts, known as cross bearers, which extend from the center sills outwardly and join the side sills. In accordance with the present invention, the cross bearers are formed integrally with the side stakes, this manner of construction being clearly illustrated in Figures 2 to 5 inclusive.

Each of the combined cross bearers and side stakes comprises an approximately triangularly shaped bearer plate 24 having a stake member 26 extending upwardly from the outer extremity of the bearer plate. In order to strengthen the bearer plate, there is provided a marginal flange 28 along the lower side of the plate and an end flange 30 which extends vertically along the inner end of the plate and is connected to one of the center sills 14 in any suitable manner, as, for example, by means of bolts or rivets 33 which pass through openings 33′ formed in the flange 30 (Figure 7). Another flange 36 extends along the top of the bearer plate 24 for a portion of the length of the plate and then terminates in order to allow a plurality of angle iron members 34 to engage the opposite marginal portions of the plate between the flange 36 and the flange 30. The angle iron

members 34 are built into the under frame of the car in a suitable manner and serve to strengthen the bearer plate 24 and to hold it rigidly in position. Similarly, angle iron members 32 extend along the lower edges of the center sills 14 and are joined to the center sills and to the flange 30 by means of the fasteners 33. The purpose of providing the inwardly extending lower flange portions of the members 32 will be explained hereinafter.

Each of the side stakes is I-shaped in cross-section and as shown comprises an inner base flange 38 which is of uniform width throughout the major portion of its length and is formed continuously with the upper flange 36 of the bearer plate 24. The top or outer flange 40 of the car stake tapers, or is of generally increasing width in a direction approaching the base of the stake, in order that its strongest portion will be disposed where the greatest strains occur, and is formed continuously with the lower flange 28 of the bearer plate 24. This is an important feature of the invention inasmuch as the continuity of the inner and outer flanges affords a degree of rigidity and strength not heretofore attained.

In order to facilitate the attachment of the sideboarding to the car stakes the inner base flange 38 of the stake is provided with a series of fastener receiving apertures 44 and an analogous provision is made in the flared out portions 46 of the base flange which permits the latter element to be rigidly secured to the side sill 12 of the car. A laterally extending flared portion 50 is provided for receiving the lower extremity of one of the diagonal braces 18 and is formed integrally with the combined cross bearer and side stake at any convenient and suitable point.

The upper flange 36 of the bearer plate 24 is provided with a plurality of fastener receiving apertures 48 which may be utilized in securing the flooring of the car to the cross bearer or under frame, and thus it will be seen that the unitary member serves to reenforce both the sideboarding and flooring of the car.

In order to increase still further the rigidity and strength of the assembled structure, it is contemplated extending bearer plates in opposite directions from the same longitudinal point along the center sills and joining these oppositely extending plates together by means of a cross strap 52 which extends beneath the center sills and is secured, by means of suitable fasteners, both to the center sills, the lower flanges of the oppositely extending bearer plates, and the lower flanges of the angle iron reenforcing members 32.

The description so far given relates to the invention generally and discloses a structural member which simplifies considerably the construction of cars of the type mentioned, and in obtaining this simplification increases rather than diminishes the strength and rigidity of the car. The invention contemplates the employment of the unitary cross bearer and side stakes in connection with other railway cars of any suitable type; for example, flat cars may be provided with the improved members, and it is likewise to be understood that box cars might be so constructed as to employ them.

It is also to be clearly understood that changes and modifications in the design of the members, or the arrangement of the flanges thereon, or the height or other dimensions of the various parts, may be changed from time to time to meet various demands, and it is pointed out that such changes and modifications are contemplated and are intended to come within the scope of the present invention.

In the type of construction shown in the drawings, the members are adapted for use in connection with cars having bottom doors and mechanism for operating the doors. Accordingly, the cross bearer plate is cut away to form an opening 54 which is surrounded by a strengthening flange 56 and is provided along its lower edge with a plurality of projections or lugs 58, both the flange 56 and the lugs 58 being formed integrally with the bearer plate 24. The opening and the projections furnish support for the door operating mechanism and likewise provide means for guiding the operating shaft for travel upwardly or downwardly through the opening as the door moves from an opened to a closed position or vice versa. In order to support the doors when they occupy an open position outwardly extending projections 60 may conveniently be formed on the under side of the bearer plate 24 to engage the side edges of the doors.

It will be seen that the bearer plate, the stake member, the flanges, and the projections are all formed integrally with one another whereby there is provided a unitary structure that accomplishes all of the functions and performances that were formerly accomplished by the provision of two separate members, and in addition the unitary member increases the strength and rigidity, and consequently the useful life of the car.

It will be appreciated that the combined cross bearer and side stake may be formed of any suitable material and in any desired manner, but there is one consideration in this connection that cannot be emphasized too strongly, namely, the unitary member or structure is formed in such a manner that it may conveniently be cast. The importance of providing cast metallic structures for railway uses is a matter of common knowledge and although the provision of a

combined cross bearer and side stake is one of the most important aspects of the invention it is not to outshadow the extremely important and desirable feature of forming a combined cross bearer and side stake in such a manner that it may be cast by the employment of ordinary casting methods that are practiced today.

Turning now to the modification of the invention which is illustrated in Figures 8 to 11 inclusive, and in which like reference characters are used to designate corresponding parts that are shown in the earlier figures, it will be seen that the member is double ended and comprises a plurality of bearer plates 24 which are cast in a single piece integrally with the flanges 30, and a connecting portion 30′ that passes beneath the center sills of the car. The side stakes 26 of the double ended member are formed exactly as they are formed in connection with single ended members, as are the openings 54, the rests 60, the flanges 36, etc.; the only outstanding difference between the designs residing in the double ended character of the member shown in Figure 8 which permits the use of a single member for accomplishing what heretofore has been accomplished by three or four separate members.

In Figure 9, the double ended member is shown as provided with a central opening 70 which is formed with crevices 72 for receiving the protruding flange portions of the center sills, it being understood that in the use of members of the type illustrated in Figure 9, the center sills are threaded through the openings in the members after the latter have been assembled.

Figure 10 shows a double ended member which may be inserted with ease after the center sills have been rigidly and permanently connected to the car. Thus, the flange portions on the center sills are turned inwardly and the outer smooth surfaces of the sills are spaced apart by a distance equal to the width of the rectangular opening in the double ended member, it being apparent that such a construction permits the member to be slipped into position with the center sills disposed within the opening.

Having thus described my invention, what I claim as new and desire to secure by United States Leters Patent, is:

1. A combined side stake and cross bearer for gondola cars and the like, comprising a flat bearer plate of approximately triangular formation, a peripheral flange extending outwardly from opposite sides of the plate and arranged to extend around a substantial portion of the periphery of the plate, an upwardly extending stake formed integrally with the plate, and a plurality of flanges formed upon opposite sides of the stake, said flanges forming with the take a member I-shaped in cross-section.

2. A gondola car construction comprising, in combination, a center sill, a plurality of oppositely disposed side sills, and a plurality of integrally combined cross bearers and side stakes extending in opposite directions from some point along the center sill, said cross bearer being rigidly secured to the center sill and arranged to extend beneath the side sills, and said side stakes being rigidly secured to the side sills.

3. A gondola car construction comprising, in combination, a center sill, a plurality of oppositely disposed side sills, and a plurality of integrally combined cross bearers and side stakes extending in opposite directions from some point along the center sill, said cross bearer being rigidly secured to the center sill, and beneath said side sills and at their upper extremities to a reenforcing member that extends peripherally of the body of the car.

4. A double ended cross bearer and side stake for railway cars, comprising, in combination, an integral body portion, arranged to extend beneath the car and adapted to span the space between the side sills of the car, and a plurality of end portions formed integrally with the body portions and arranged to extend upwardly along the side boarding on opposite sides of the car.

Signed at Chicago, Illinois, this 29th day of October, 1928.

F. A. LORENZ, JR.