A. C. MURPHY.

SIDE FRAME FOR RAILWAY TRUCKS.

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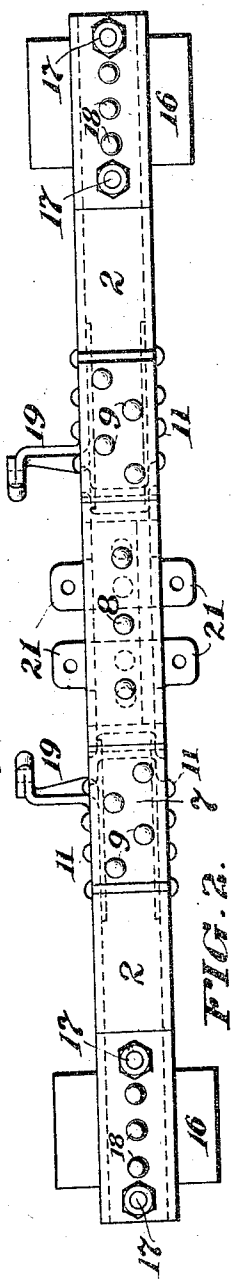

FIG. 2.

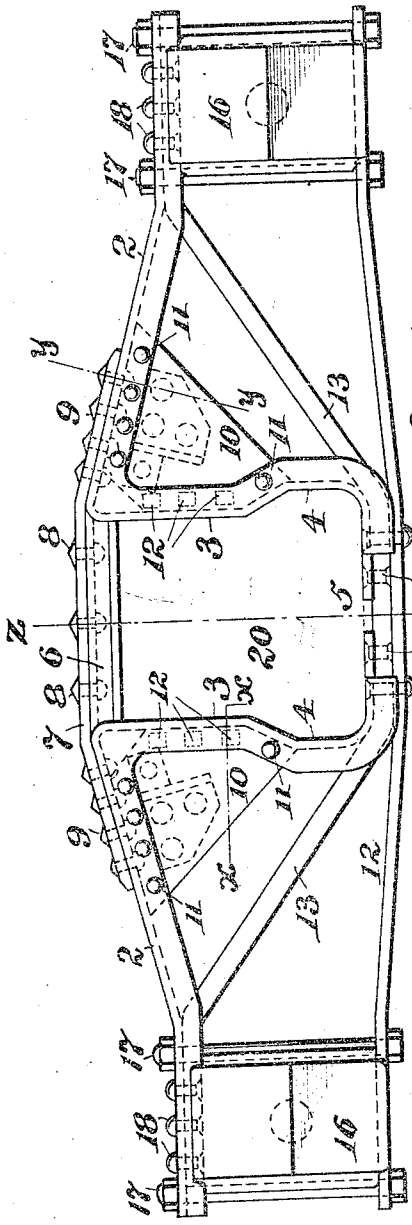

FIG. 1.

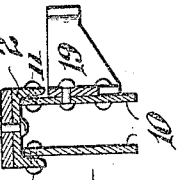

FIG. 5.

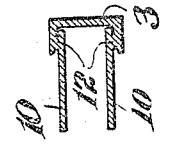

FIG. 4.

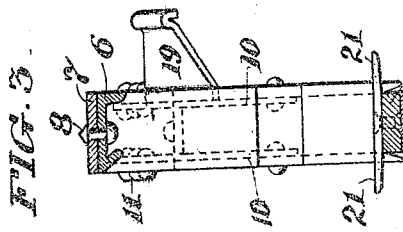

FIG. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

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SIDE FRAME FOR RAILWAY-TRUCKS.

1,034,488

Specification of Letters Patent. Patented Aug. 6, 1912.

Application filed April 22, 1911. Serial No. 622,695.

To all whom it may concern:

Be it known that I, ALBERT C. MURPHY, a citizen of the United States, resident of New York, county of New York, and State of New York, have invented an Improvement in Side Frames for Railway-Trucks, of which the following is a specification.

My invention has reference to side frames for railway trucks and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

The object of my invention is to provide a construction of built up truck side frame which shall embody great strength and durability and at the same time employ girder frames in its make up, preferably of commercial forms of bar and sheet metal, whereby economy may be secured in the cost of production, the frame to be light in weight and to embody a construction capable of being produced without the necessity of costly machinery.

My object is also to provide a construction of built up side frame for railway trucks in which columns heretofore employed will be entirely dispensed with, as it is found in practice that any construction which requires the use of vertical guide bolts for holding the column in position between the top arch bar and the bottom arch bar is objectionable in that the nuts are liable to become loosened and the general structure weakened by the looseness so provided.

More particularly, my object is to provide columns which are integral with the top arch bar structure and are not dependent in any way upon bolts for their strength or position.

My invention consists of a construction of side frame for trucks in which the main member comprising the top arch bar shall be formed of steel bars of girder form in cross section, preferably of channel construction and so shaped as to provide at the middle of the truck a vertical bolster opening, said opening being formed by vertical portions of the steel bars of girder or channel shape which act as columns and having horizontally turned bottom portions for reception of the spring base channel, combined with a compression or strut member bridging the bolster opening at the top and secured in place by a cover or compression plate, the ends of which are riveted to the girder or channel top arch part, gusset plates secured in position at the inside and upper portions of the columns to reinforce or strengthen the angular bends of the girder or channel bar between the top arch bar portion and the column portion, said gusset plates being so secured to the column portions as to provide smooth outer surfaces to the same whereby they may act as guides for the bolster, a tension member or bottom arch bar connected at its ends with the free ends of the top arch bar portions and having its middle portion extended under the horizontal girder or channel bar portions at the base of the bolster opening, a tie bar also secured to the tension member and the channel iron structure at the base of the bolster opening, and journal boxes for the axles secured between the free ends of the tie bar and the free ends of the top arch bars and tension members.

My invention further consists in various details embodied in the type of built up truck side frame, above specified, and which are fully described hereinafter and more particularly defined in the claims.

Referring to the drawings: Figure 1 is a side elevation of a built up side frame for trucks embodying my invention: Fig. 2 is a plan view of the same; Fig. 3 is a vertical cross section of the same on line *z—z;* Fig. 4 is a cross section of a portion of the same on line *x—x;* and Fig. 5 is a section of a portion of the same on line *y—y.*

2, 2 are the arch bars which extend from axle box to axle box of the truck, and instead of being continuous over the bolster opening 20, said top arch bars are bent downward to form the vertical portion 3, then backward as at 4 to form the wider part to the bolster opening adjacent to the bottom thereof and thence inward as at 5 to form the bottom of the bolster opening. The wider lower portion of the bolster opening 20 between the parts 4, 4, provides a space below each of the column portions 3, 3, for the introduction of the usual bolster guides before the bolster is raised into position for its guides to coöperate with the portion 3, 3. These parts 2, 3, 4 and 5 are preferably formed of a girder bar of channel cross section, which is more fully shown

in Figs. 3, 4 and 5. The opening between the parts 2 at the top of the bolster opening is closed by the compression strut 6 and the cover or compression plate 7, these two parts being secured together by rivets 8 and the ends of the cover plate secured to the top of the top arch bars by rivets 9.

The compression strut 6 is formed of a piece of channel iron of approximately the preferable cross section of the top arch bar and of a length to just fit in the space between the two vertical column portions 3, 3, as clearly illustrated in Fig. 1. In practice, one of the flanges of this compression strut is bent inward, as indicated in Fig. 3 for the purpose of providing clearance space for parts of the movable bolster. To strengthen the girder or channel bar at the sharp bend between the parts 2 and 3 thereof, I provide gusset plates 10 which are formed of steel and riveted to the side flanges of the parts 2 and 3 at the points 11, and preferably welded by any suitable method at the points indicated at 12, these points being the same with respect to both flanges of the girder or channel iron, if four gusset plates be employed. This welding union is indicated more fully in Fig. 4, and the object of welding the gusset plates to the flanges of the girder or channel iron is to secure a union of the two parts without presenting any obstructions upon the outer surfaces, so that the said outer surfaces may present smooth guiding surfaces for the guides of the bolster. Of course, it is evident that countersunk rivets might be employed, as is common in sheet iron working in place of the welded portions 12, but the presence of these rivets would weaken the structure of the column portion and would not make as rigid or firm a union as the welding. It is also evident that the rivets 11 on the columns and below the welded portions 12 may be also welded if so desired. In fact, the gusset plates may be secured in place by welding at all places if so desired. In any event, and irrespective of the particular manner of uniting the gusset plates to the vertical portions 3 forming the columns, the outer surface of said column portions must be unobstructed sufficiently to provide smooth guide surfaces of the requisite width to permit the bolster guides to move freely upon the said columns. If desired, the gusset plates 10 may be arranged only on the inner side of the truck side frame, namely, adjacent to the brake hanger parts 19.

13 represents the tension member, and at its free ends it is riveted to the ends of the top arch bars by rivets 18 and the thickness of this bar 13 is substantially equal to the depth of the groove in the preferred channel iron structure of which the top arch bar is formed, so that very little finishing of the edges of the flanges of the channel bar are necessary to permit them, as well as the tension member, to fit snugly upon the top of the journal box 16. The middle portion of the tension member extends under the portion 5 of the channel iron adjacent to the bottom of the bolster opening, and said tension member is riveted to the channel iron portions by the rivets 14 and 15. In addition to the tension member 13 described and which in effect constitutes the bottom arch bar, there is a second tension member 12 which is riveted to the tension member 13 and channel iron horizontal extensions of the columns by the rivets 14, before referred to, and the free ends of this tie bar extend under the journal boxes 16. The journal boxes 16 are clamped between the free ends of the tie bar 12 and the free ends of the top arch bar and its tension member or bottom arch bar by means of the bolts 17.

The construction of truck frame above described has the double tension members 12 and 13 and the upper compression member formed by the parts 2, 7, 6, 2; and said top arch bar structure and tension member or bottom arch bar structure are combined into a rigid girder structure by the employment of the column portions 3, 4 and the gusset plates 10, above described.

In practice, I find it more convenient to make each of the parts, 2, 3, and 4 separate and rely upon them being connected into a continuous structure by means of the rivets 14 and 15 associated with the tension member 13 and the tie bar 12. I, however, do not restrict myself to the dividing of these two portions of the girder or channel bar structure adjacent to the bottom part 5, as said parts may be continuous, as indicated in dotted lines. It will, however, be readily understood that the making of the various parts 2, 3, 4, and 5 extending from axle-box to axle-box would involve a much more complicated set of bending dies and would require more careful and expensive manipulation to insure the proper associated bends, and I therefore prefer that the girder or channel bar portion shall be made in two similar parts, subsequently to be connected in alinement at the bottom of the bolster opening by the rivets 14 and 15 in connection with the tension members 12 and 13, and more particularly the latter. In all cases, whether the girder or channel bar parts are made in one or two sections, the gap forming the top of the bolster opening 20, is positively closed by the compression strut and the cover plate hereinafter referred to or equivalent structures, so that the members 2, 2, are structurally connected by the said compression strut and cover plate into a continuous rigid compression member, which may be properly termed the

top arch bar since it will be in general shape an inverted form of the tension member 13 comprising the bottom arch bar. The flanges of the girder or channel bar adjacent to the bottom of the bolster opening are bent outward into alinement with the body of the channel iron to form wings, indicated at 21, said wings being provided with holes and acting as means of attachment for the spring base channel.

19 are brake hanger brackets and are formed of sheet metal bent in special form and flanged at their bases, said flanges being riveted to the gussset plates 10 on the inner side of the truck frame; and while this manner of attaching the brackets is a satisfactory one, I, however, do not limit myself to any particular form of brake hanger bracket, as such elements and mode of attachment are of minor importance to the real invention which comprises the built up truck side frame whereby great strength is secured with lightness and cheapness and preferably by the employment of ordinary commercial stock forms of metal bars.

The more important features of my invention reside in the continuity of the parts 2 and 3, whereby the girder bar forming the column and the top arch bar portion leading to the journal box are in one integral piece; and secondly, in the oppositely arranged portions 2, 2, of the top arch bar and the column portions 3, 3, combined with the interposed and connecting portion 7 preferably having the strut part 6. By this construction, all bolted or riveted joints or unions between the parts 2 and 3 are avoided and hence the danger of looseness of the columns in use is wholly avoided. The employment of girder forms of bars give great lightness, coupled with the desired strength and, moreover, the use of the preferred channel form of bar in the making of the parts 2, 3, 4 and 5 has the advantages of forming sockets between the side flanges which lock the tension member or lower arch bar 13 in place against lateral displacement, thereby greatly reducing the shearing strain which would otherwise come upon the rivets. While I prefer rolled girder shapes from which to make the truck frame, it is evident that such girder bars may be otherwise formed, as for example, by being pressed into the requisite cross section, but, this is immaterial as my invention resides in the truck structure and not in the particular manner of forming the bars from which the elements thereof are composed.

While I have shown my invention in the exact form which I have found by practical adaptation of my invention to be the form which is most suitable, I do not restrict myself to the details, as these may be modified without departing from the spirit of the invention.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a built up side frame for railway trucks, a top arch bar formed of channel iron portions spaced apart and connected together by a compression strut and cover plate closing the top part of the bolster opening, and said channel iron portions of the top arch bar being extended vertically downward to form columns and thence extended horizontally toward each other to form the bolster opening, combined with axle boxes, and tension members extending from the axle boxes beneath the columns of the channel iron and secured thereto.

2. In a built up side frame for railway trucks, a top arch bar formed of channel iron portions spaced apart and connected together by a compression strut and cover plate closing the top part of the bolster opening, and said channel iron portions of the top arch bar being extended vertically downward to form columns and thence extended horizontally toward each other to form the bolster opening, reinforcing gusset plates secured to the flanges of the top arch bar portions and in which the outer surfaces of the flanges of the column portions are flat to form smooth guiding surfaces upon each side of the bolster opening, combined with axle boxes, and tension members extending from the axle boxes beneath the column portions and secured thereto.

3. In a built up side frame for railway trucks, a top arch bar formed of channel iron portions spaced apart and connected together by a compression strut and cover plate closing the top part of the opening, and said channel iron portions of the top arch bar being extended vertically downward to form column portions and thence extended horizontally toward each other to form the bolster opening, reinforcing gusset plates secured to the flanges of the top arch bar portions and the column portions said gusset plates being secured to the flanges of the top arch bar portions by rivets and to the flanges of the vertical column portions by welding so as to present continuous smooth surfaces upon the outer flange portions of the columns, combined with axle boxes, and tension members extending from the axle boxes beneath the column portions and secured thereto.

4. In a built up side frame for railway trucks, a top arch bar formed of channel iron portions spaced apart and connected together by a compression strut and cover plate closing the top part of the bolster opening, and said channel iron portions of the top arch bar being extended vertically downward to form columns and thence extended horizontally toward each other to form the bolster opening, and in which fur-

ther the flanges of the horizontal portions of the channel iron adjacent to the bottom of the bolster opening are bent laterally into wings to provide means for attachment of the spring base channel beam, combined with axle boxes, and tension members extending from the axle boxes beneath the column portions and secured thereto.

5. In a built up side frame for railway trucks, a top arch bar formed of channel iron portions spaced apart and connected together by a compression strut and cover plate, closing the top part of the bolster opening and said channel iron portions of the top arch bar being extended vertically downward to form columns and thence extended horizontally toward each other to form the bolster opening, reinforcing gusset plates secured to the flanges of the channel iron of the top arch bar portions and of the column guide portions and in which the outer surfaces of the flanges of the column portions are flat to form smooth guiding surfaces upon each side of the bolster opening, combined with axle boxes, tension members extending from the axle boxes beneath the column portions of the channel iron, and brake hanger brackets secured to the gusset plates upon each side of the bolster opening and extending laterally away from the said plates.

6. In a built up side frame for railway trucks, the combination of a combined top arch bar and column structure formed of channel iron, with suitable tension members to form a truck frame extending from axle box to axle box of the truck and said tension members of less transverse width than the width of the channel iron and inclosed between the side flanges thereof at their points of contact, said combined top arch bar and column structure further comprising two sections of similar form extending in opposite directions and having their ends inclosing and riveted to the tension members and their intermediate portions bent with an incline upward and thence downward to form the columns and their portions at the bottom of the columns inclosing and riveted to the tension members, and a compression member connecting the upwardly inclined portions of the two arch bar sections and spacing them to form the bolster opening.

7. In a built up side frame for railway trucks, the combination of a combined top arch bar and column structure formed of channel iron, with suitable tension members to form a truck frame extending from axle box to axle box of the truck and said tension members of less transverse width than the width of the channel iron and inclosed between the side flanges thereof at their points of contact, said combined top arch bar and column structure further comprising two sections of similar form extending in opposite directions and having their ends inclosing and riveted to the tension members and their intermediate portions bent with an incline upward and thence downward to form the columns and their portions at the bottom of the columns inclosing and riveted to the tension members, a compression member connecting the upwardly inclined portions of the two arch bar sections and spacing them to form the bolster opening, and gusset plates secured to each of the side flanges of the channel iron sections forming the upwardly inclined top member and the column portion and located back of the outer side surfaces thereof.

8. In a built up side frame for railway trucks, the combination of a combined top arch bar and column structure, with suitable tension members to form a truck frame extending from axle box to axle box of the truck, said combined top arch bar and column structure comprising two girder sections of similar form extending in opposite directions and having their ends riveted to the tension members and their intermediate portions bent with an incline upward and thence downward to form the columns, a compression member connecting the upwardly inclined portions of the two sections together and spacing them to form the bolster opening, gusset plates secured to the flanges of the girder sections forming the upwardly inclined top member and the column portion and said union of the gusset plates with the last mentioned flanges formed within the inner surfaces of the columns at their vertical guiding portions so as to form no obstructions thereon.

9. In a built up side frame for railway trucks, a top arch bar formed of two bar portions of girder cross section spaced apart and connected together by a compression member closing the top part of the bolster opening, said two portions of the top arch bar of girder cross section being extended vertically downward to form columns integral with said top arch bar portions, and gusset plates secured to the flange portions of the top arch bar and located wholly back of the planes of the sides of the said top arch bar combined with axle boxes and tension members extending from the axle boxes beneath the column portions and secured thereto.

In testimony of which invention, I hereunto set my hand.

ALBERT C. MURPHY.

Witnesses:
JOHN H. ALLEN,
WM. J. MADILL.