D. S. BARROWS.

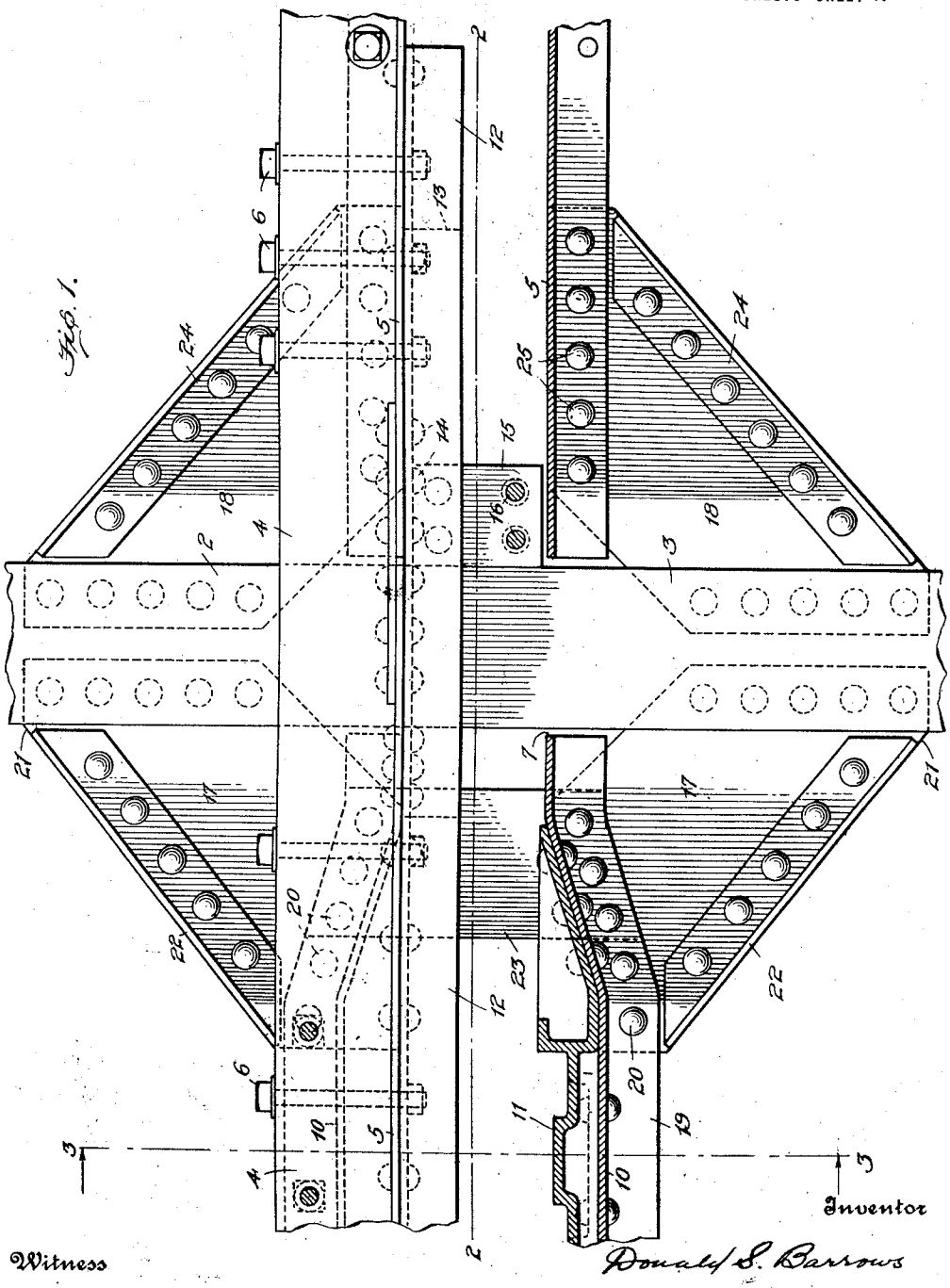
CAR UNDERFRAME.

APPLICATION FILED JULY 29, 1919.

1,378,645. **Patented May 17, 1921.**

2 SHEETS—SHEET 1.

Fig. 1.



Witness

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2 SHEETS—SHEET 2.

Fig. 2.

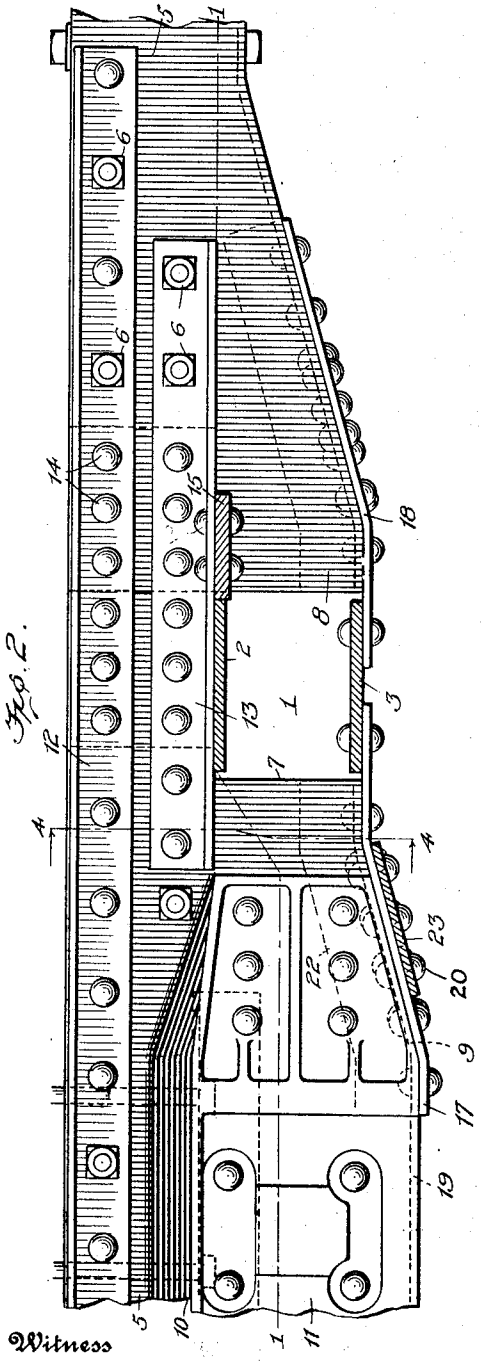


Fig. 3.

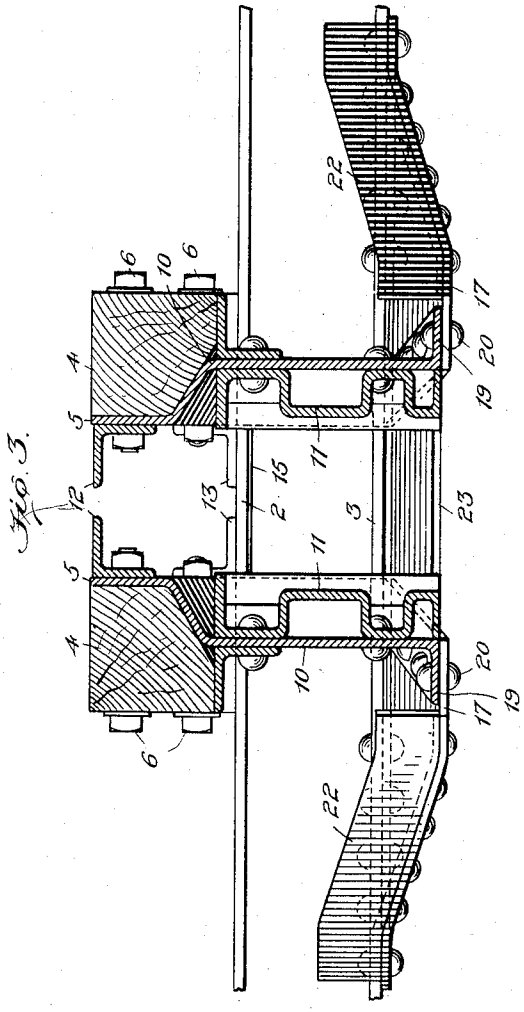
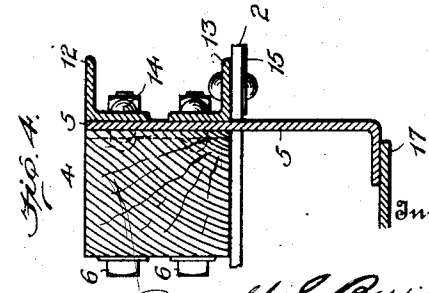


Fig. 4.



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DONALD S. BARROWS, OF ROCHESTER, NEW YORK.

CAR-UNDERFRAME.

1,378,645. Specification of Letters Patent. Patented May 17, 1921.

Application filed July 29, 1919. Serial No. 313,985.

To all whom it may concern:

Be it known that I, DONALD S. BARROWS, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Car-Underframes; and I do hereby 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 appertains to make and use the same.

The invention relates to car underframes for railway cars and more particularly to a strong, reliable and efficient metallic structure adapted to be applied to cars of old construction to reinforce the underframes thereof so as to adapt said cars for use under modern service conditions. To this end the principal object of my invention, broadly stated, is to provide a metallic structure adapted to be used with the underframes of wooden cars, said structure being arranged to reinforce the car underframes adjacent the bolsters thereof so that the buffing and pulling shocks which exceed the capacity of the draft rigging are transmitted to the bolster bottom members and through the latter to the car underframe without damage to the sill members adjacent the bolster.

Another object of my invention is to provide a car underframe reinforcing structure, the said structure being arranged so as greatly to increase the effective depth of the sill section forward of the bolster whereby the sills effectively resist the strains and stresses imposed thereon by modern service conditions; the effective depth of the sill section being obtained without increasing depth of the underframe and without the addition of excessive weight thereto.

There are other features of the invention as will be pointed out hereinafter in connection with the detailed description of the single embodiment of the invention which has been illustrated in the drawings in which:—

Figure 1 is a half plan and half section, the section being taken on line 1—1 of Fig. 2, showing the application of the invention to a car underframe.

Fig. 2 is a longitudinal vertical section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1, the section being viewed in the direction indicated by the arrows and

Fig. 4 is a section on line 4—4 of Fig. 2, the section being viewed in the direction indicated by the arrows.

Throughout the specification and drawings like parts are designated by like reference characters.

To avoid unnecessary drawings, I have illustrated only that portion of a car underframe adjacent the body bolster. It is to be understood however, that the structure is duplicated at the opposite end of the car and that the draft plates, hereinafter described preferably extend a distance of several feet beyond the bolster toward the center of the car.

The numeral 1 designates the body bolster which may and preferably comprises an upper plate 2, a lower plate 3, and any suitable form of center filler or diaphragm, not shown. Passing above the upper plate 2 of the said bolster are the center sills of the car which are designated by the numeral 4—4. To the inner faces of the said center sills are connected in any suitable manner the draft plates 5—5, the means shown in the drawing for connecting the said draft plates comprising the bolts 6. Said draft plates are provided with a cut out or recess 7 through which the bolster 1 passes. These recesses are preferably provided in the depending portions 8 of the said draft plates which portions are preferably formed substantially as shown, that is the depth of the draft plates increases from a point in rear of the bolster 1 to the bolster at which point the depending portions of the draft plates are in line with the lower member 3 of the said bolster, forward of the bolster 1 the draft plates are again increased in depth as shown at 9 and are preferably widened out as at 10 to form a housing for the cheek plates 11 of the draft rigging. It might be here pointed out that in the reconstruction of old wooden cars the wooden draft sills which were connected to the lower faces of the center sills are removed and the metallic draft plates which are substituted for the wooden draft sills are widened out so as to accommodate the present standard draft rigging which is from three to five inches wider than the old draft rigging used in wooden cars.

To reinforce and strengthen the draft plates adjacent the bolsters 1, I preferably provide the said plates with longitudinally extending reinforcing members which may

be and preferably are in the form of angle bars 12 and 13, the bars 12 extending along the upper edges of the draft plates while the bars 13 extend along the draft plates adjacent the lower edge of the center sills and preferably immediately above the upper plate 2 of the bolster 1. The said plates are preferably connected to the adjacent draft plates by means of the rivets 14, if desired the securing bolts 6 may also pass through the said plates 12 and 13. To further reinforce the draft plates adjacent the bolsters there is provided a tie plate 15 which extends from the inner face of one draft plate to the inner face of the opposite plate immediately in rear of the upper member 2 of the bolster, the said tie plate 15 being preferably connected to the said draft plates by means of the rivets 16 which extend through the inwardly directed flanges of the reinforcing plates 13.

To the lower plates 3 of the bolsters and on opposite sides of the center sills are connected a plurality of gusset plates 17—17 and 18—18, the plates 17—17 being rigidly connected to the forward edge of the said plate 3 and extending forwardly and downwardly therefrom so as to underlie the flange 19 which is provided adjacent the lower edge of the depending portions of said draft plates. The said plates 17 are connected to the said flanges by means of the rivets or other suitable fastening means 20. The inclined edges 21 of the said gusset plates 17 are each shown reinforced by an angle bar 22, the said bars 22 terminating short of the forward edge of the plates 3 and the outer edges of the flanges 19, although any other suitable form of reinforcement may be used or the edges may be flanged to provide integral reinforcement. To tie together and strengthen the lower edges of the draft plates adjacent the bolster, and forward of the same there is provided a plate 23 which extends from draft plate to draft plate beneath the gusset plates 17 and the rivets 20 which connect the said plates 17 are also adapted to extend through the tie plate 23. The plates 18 are connected to the rear edge of the plate 3 and extend rearwardly and upwardly therefrom so as to underlie the lower flange 19 of the draft plates in rear of the said bolster. These plates 18 are likewise shown reinforced by the angle bars 24 similar to the angle bars 22 hereinbefore described and are connected to the flanges 19 of the draft plates 5 by means of the rivets 25.

By this construction the shocks transmitted through the draft rigging are carried more directly to the bolsters and by carrying the lower flange stress through at a level of the bottom of the bolster instead of being obliged to carry said stress up to and over said bolster, as in older designs, I secure a great increase in effective depth of the sill section since the section modulus increases approximately as the square of the depth increases. I therefore secure a more effective draft arm with less weight of metal.

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

1. In a car underframe, the combination with wooden center sills of metallic draft plates connected to the vertical faces of the said sills, each of said metallic plates being provided with a depending portion, said portion gradually increasing in depth from a point in rear of the body bolster and being adapted to embrace the said bolster, and means for reinforcing the lower edges of said depending portions, said means comprising members connected to the lower member of the said bolster and extending forwardly and rearwardly thereof and adapted to underlie and to be connected to the adjacent portions of said plates.

2. In a car underframe, the combination with wooden center sills and a metallic bolster, or draft plates connected to the inner faces of the said sills and extending over the said bolster, each of said draft plates being furnished with an integral depending portion which is adapted to embrace the said bolster and means for reinforcing the lower edges of said plates adjacent the said bolster, said means comprising gusset plates which flare outwardly from the respective sill faces and which are connected to the said bolster and extending forwardly and rearwardly thereof and underlying and connected to the adjacent portions of the said plates.

3. In a car underframe, the combination with wooden center sills and a metallic bolster, of draft plates connected to the said sills and depending below the same, the draft plates having an opening therein to receive the said bolster, the lower portions of said plates immediately in rear of said bolster being in line with the bolster bottom member and extending upwardly therefrom, and means for rigidly connecting said plates to said bolster, said means comprising outwardly flaring gusset plates underlying said draft plates and overlapping the said bolster bottom member some of said gusset plates extending rearwardly of said bolster.

4. In a car underframe, the combination with wooden center sills and a metallic bolster, of flanged draft plates each furnished with an integral tapering depending portion, said portions having a slot therein of substantially the depth of and adapted to receive the said bolster, a pair of gusset plates connected to the bolster and extending forwardly and inwardly therefrom and each adapted to underlie and be connected to the flange of the adjacent draft plate, and means for connecting said plates adjacent the said

gusset, and means for reinforcing said draft plates in rear of said bolster.

5. In a car underframe, the combination with the center sills and bolster, of draft plates each furnished with an integral depending portion adapted to embrace the bolster, the portions of said plates in rear of the bolster tapering upwardly and rearwardly therefrom, means for connecting said plates to the said sills, a gusset plate connected to each draft plate and extending rearwardly and outwardly therefrom, means for connecting said gusset plates to said bolster, a second pair of gusset plates connected to the lower bolster members and extending rearwardly and upwardly therefrom, and means for connecting said last named gusset plates to the adjacent portion of the said draft plates.

In testimony whereof I affix my signature.

DONALD S. BARROWS.