Oct. 6, 1942. R. B. COTTRELL 2,297,748

SIDE FRAME

Filed Dec. 13, 1940 2 Sheets-Sheet 1

Fig. 1.

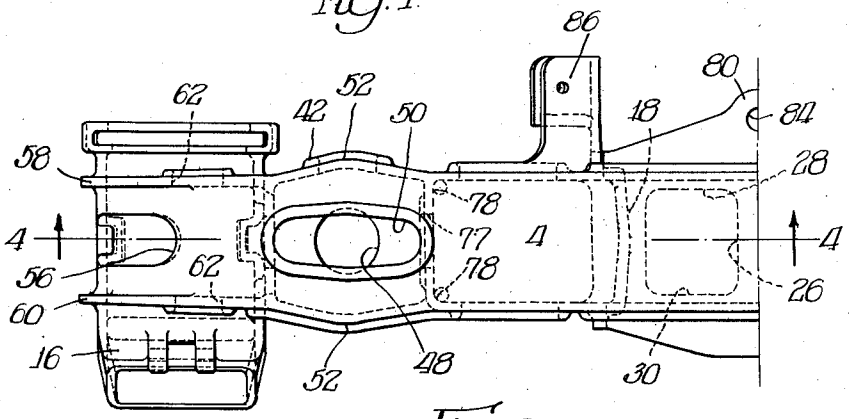


Fig. 2.

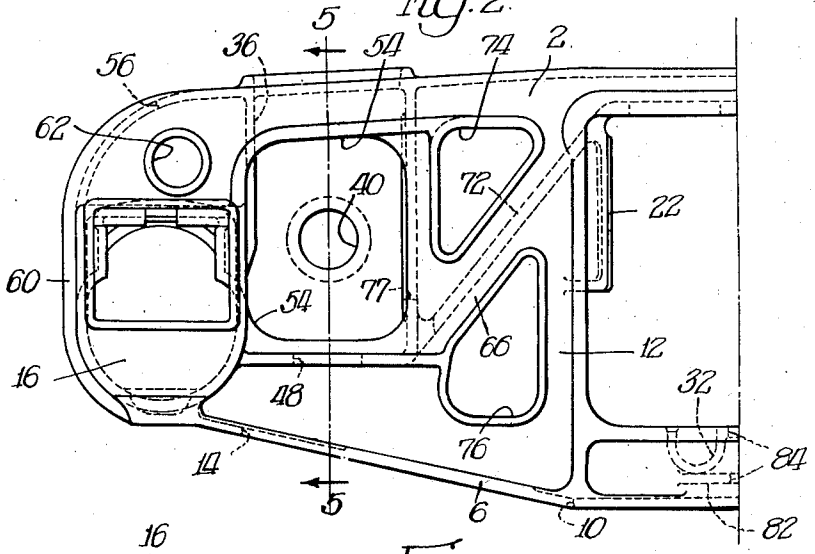
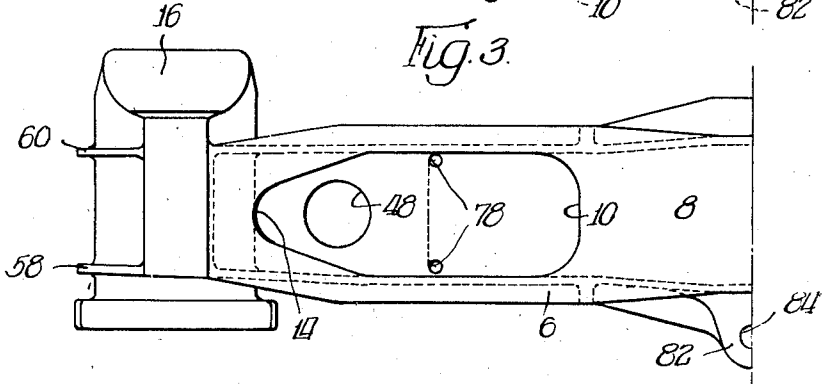


Fig. 3.



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SIDE FRAME

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Fig. 4

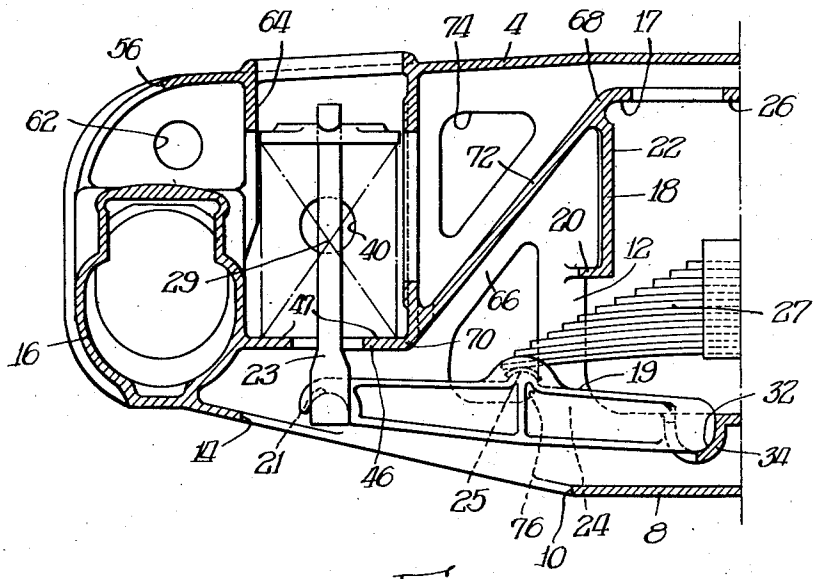
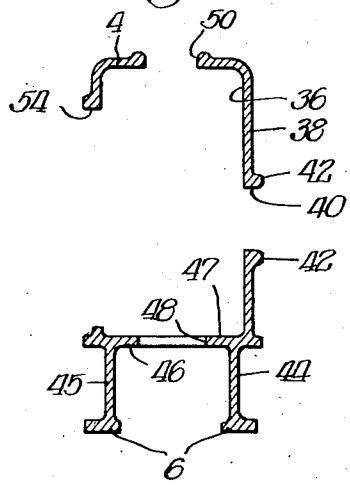


Fig. 5



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Patented Oct. 6, 1942

2,297,748

UNITED STATES PATENT OFFICE

2,297,748

SIDE FRAME

Robert B. Cottrell, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application December 13, 1940, Serial No. 369,922

4 Claims. (Cl. 105—206)

My invention relates to railway car trucks and more particularly to a novel form of cast steel side frame.

A well-known type of truck at present in use embodies an arrangement of a semi-elliptic spring extending longitudinally of each side frame with the extremities thereof seated upon a lever member at either side of the bolster opening, said semi-elliptic spring extending longitudinally of the frame through the bolster opening and between the column walls at either side thereof. The lever member or fulcrum bar at each end of the side frame is fulcrumed at one end on the tension member adjacent the transverse center line of the side frame at the spring seat portion thereof, and its opposite end is connected through a hanger arrangement with a coil spring group afforded a seat adjacent the journal box.

For this particular form of car truck I have devised a novel cast steel side frame of truss type comprising the usual tension and compression members with spaced columns forming a bolster opening and with integral journal boxes.

A different object of my invention is to devise a novel form of cast steel side frame particularly suitable for the above-mentioned type of truck and adapted to meet in satisfactory manner present foundry practices as well as present standard requirements in use.

A more specific object of my invention is to devise a type of side frame such as above described comprising integral spring pockets adjacent each journal box and diagonal struts joining the lower corner of each spring pocket with the adjacent column at its juncture with the compression member.

A yet different object of my invention is to design a side frame such as referred to above comprising integral spring pockets adjacent each journal box and having the rear wall of each spring pocket of substantial proportions, and the front wall thereof open to permit insertion of associated springs.

My invention further comprehends such a type of side frame as that described wherein each column presents a bolster guide surface along its upper portion and is bifurcated along its lower portion to admit between the walls thereof an associated fulcrum member, one end of which may be positioned on the adjacent spring seat portion of the tension member.

Figure 1 is a top plan view of my novel form of side frame. Figure 2 is a side elevation thereof, and Figure 3 is a bottom plan view.

Figure 4 is a longitudinal section taken substantially in the vertical plane bisecting the frame and as indicated by the line 4—4 of Figure 1. In this figure are also shown certain portions of the associated spring assembly.

Figure 5 is a sectional view in a transverse vertical plane through the spring pocket adjacent the journal box and substantially as indicated by the line 5—5 of Figure 2.

In each of Figures 1 to 4 only one-half of the frame structure is shown inasmuch as the opposite ends of the frame are identical in form and arrangement.

My novel side frame comprises the compression member 2 of inverted U-section with a top web 5 and inboard and outboard depending flanges, and a tension member 6 also of U-section, the transverse web 8 (Figure 4) of which is broken as at 10 approximately beneath the column 12. The opening thus formed extends longitudinally of the tension member to a point 14 adjacent the journal box 16 so that the tension member outwardly of the box section central portion comprises spaced inboard and outboard vertical walls 44 and 45 (Figure 5) of substantially I-section between which the longitudinal opening 10—14 affords room for play of a fulcrum lever 19 (Figure 4), one end of which is pivoted from a fulcrum seat hereinafter referred to in said central box section, and the other end of which may be seated as at 21 on the hanger 23, which is supported from the spring group diagrammatically shown at 29. The said fulcrum lever has at an intermediate point a spring seat 25 on which may be positioned one end of the semi-elliptic spring 27. The journal box is integrally formed with the before-mentioned tension and compression members and with spaced columns 12, 12 to define a bolster opening 17. Inboard and outboard portions of each column are joined by an integrally formed transverse web 18 (Figure 4) of shallow V-shape, as may be observed from the top plan view of Figure 1, and at the lower edge of the web 18 is formed a horizontal flange 20 thus affording added rigidity for the bolster guide surface 22 on the opposite faces of the columns. By this form of column structure lateral space is afforded between the inboard and outboard legs of each column 12 along the bottom portions thereof to accommodate the aforementioned semi-elliptic spring extending longitudinally of the frame between said column walls. Said column walls

merge as at 24 at their lower extremities with the inboard and outboard upstanding flanges of the tension member 6. Above the bolster opening 17 the inboard and outboard depending flanges of the compression member are joined by an integral strut 26 and said depending flanges are reflanged as at 28 and 30 (Figure 1) thus forming a box-like section over said bolster opening.

Beneath the bolster opening 17 is formed a fulcrum seat 32 defined by the arcuate web 34 extending between the inboard and outboard flanges of the tension member 6 thus affording a seat for one end of the fulcrum lever 19 which extends through the adjacent column 12.

Adjacent the journal box 16 may be formed the spring cavity 36 of box-like shape as may best be seen from a comparison of Figures 4 and 5. Said spring cavity is defined by a rear wall 38 continuous with the inboard flange of the compression member 2, said wall 38 being formed with the central lightening opening 40, beaded around its inboard margin as at 42, 42. The lower portion of the wall 38 is substantially continuous with the inboard portion 44 of the tension member 6, and the bottom of the spring cavity 36 is defined by the horizontal wall 46 affording a seat as at 47 for the included spring group Said bottom wall 46 is cored away centrally thereof as at 48 to accommodate a hanger, one end of which may be supported on the spring group positioned in the spring pocket 36 and the other end of which may have a pivotal connection with the swinging end of the before-mentioned lever arm. Below the spring seat 47 the tension member is formed in outboard and inboard portions of substantially I-section, as may be noted in the sectional view of Figure 5.

The top wall of the spring pocket 36 is continuous with the web 4 of the compression member forming a part thereof, said web being broken by the longitudinally arranged oval opening 50 above said spring pocket. The inboard and outboard walls of the spring pocket or cavity 36 are bulged slightly outwardly as may be noted at 52, 52 in the top plan view of Figure 1, thus more conveniently accommodating the enclosed spring group. The outboard wall of the spring pocket is cored away as at 54 to form a relatively large rectangular opening suitable for insertion, removal, or inspection of the spring group.

The top web of the compression member is cored away as at 56 (Figure 4), and the inboard and outboard walls or flanges of said compression member are continued in the inboard and outboard vertical flanges 58 and 60 extending around the box at the extremity of the frame, as best seen in the views of Figures 1 and 3. Core openings are formed in said vertical walls above the journal box as at 62, 62. Above the journal box and approximately in line with the inner wall thereof, the frame structure is reinforced by the depending transverse flange 64 (Figure 4).

A further reinforcement for the side frame structure is afforded by the diagonal strut 66, the upper end of which merges as at 68 with the compression member 4 and the column 12 adjacent their juncture. The lower end of the strut 66 merges as at 70 with the inner corner of the spring pocket 36, and likewise with the portion of the tension member 6 adjacent thereto. The strut 66 comprises a transverse plate or web 72 merging at its inboard and outboard longitudinal edges with the vertical portions of said strut so that a transverse vertical section through said strut is substantially in the form of an H. Above and below the strut 66 are thus formed the small triangular window openings 74 and 76, said opening 74 being defined by the strut 66, the compression member 2, and the adjacent wall of the spring pocket 36, said wall being cored away centrally thereof in the opening 77; and said opening 76 being defined by the tension member 6, the strut 66 and the adjacent column 12. At the juncture of the lower end of the strut 66 with the corner of the spring pocket are formed the drainage openings 78, 78 (Figure 1).

Adjacent the transverse center line of the truck and on the inboard face of the tension member 6 may be formed upper and lower spaced lugs 80 and 82 with aligned openings 84, 84 for reception of a tie rod extending between said frames.

Adjacent the juncture of the compression member 2 with the column 12 and the strut 66, and on the inboard face of the frame may be formed the usual brake hanger bracket 86.

It will thus be seen that I have devised a cast steel side frame eminently suitable for the type of truck under consideration, and I have utilized a truss formation in the structure of said frame which enables me to secure maximum strength with a given weight for this particular type of structure.

It is to be understood that I do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a cast steel truss side frame, tension and compression members merging at corresponding ends with integral journal boxes, spaced columns forming therewith a bolster opening, said tension member having a box section beneath said opening and comprising spaced vertical walls outwardly of said columns, spring pockets integrally formed in said frame adjacent each journal box, each of said pockets being defined by a wall of the adjacent box, a spaced vertical wall, a bottom wall merging with said tension member, and an inboard wall extending between said tension and compression members at one side of said pocket, and a diagonal strut at each side of said frame extending from the juncture of the adjacent column with said compression member diagonally downward to merge with the lower corner of the adjacent spring pocket and merging at said corner with said bottom wall and said inboard wall.

2. In a truss type side frame, tension and compression members merging at their ends with integral journal boxes, integral spaced columns forming therewith a bolster opening, a fulcrum seat formed in said tension member beneath said opening, said columns having V-shaped bolster guide surfaces along their upper portions and at their lower portions comprising inboard and outboard walls spaced to accommodate associated fulcrum members extending from said seat between said walls, a spring pocket in said frame adjacent each journal box, each of said pockets having a bottom wall merging with said tension member, a vertical wall spaced from the adjacent column and an inboard wall extending between said tension and compression members, and a diagonal strut at each end of said frame merging

at its lower end with said inboard wall and said intermediate wall and at its upper end with the adjacent column and said compression member.

3. In a cast steel truss side frame, tension and compression members merging at corresponding ends with integral journal boxes, spaced columns forming therewith a bolster opening, each of said members comprising a transverse web and inboard and outboard webs, spring pockets integrally formed in said frame adjacent said boxes, each of said pockets being defined by a wall of the adjacent box, a spaced vertical wall, a bottom wall merging with the inboard and outboard webs of said tension member and an inboard wall merging with the inboard webs of said tension and compression members, and a diagonal strut at each end of said frame, the upper end of said strut merging with the adjacent column at its juncture with said compression member and the other end of said strut merging with the adjacent pocket at the bottom corner thereof adjacent the vertical wall of said pocket.

4. In a cast steel side frame, top and bottom members merging with spaced columns to define a central bolster opening, integral journal boxes at the ends of said frame, a spring pocket adjacent each box defined by a wall of said box, a spaced vertical wall, a bottom wall merging with said bottom member and an inboard wall extending between said top and bottom members, and a diagonal strut at each end of said frame having its upper end merging with the adjacent column at its juncture with said compression member and its lower end merging with the adjacent pocket at the juncture of the bottom wall, the inboard wall and the vertical wall of said pocket.

ROBERT B. COTTRELL.