

June 29, 1943.

F. KOCH ET AL

2,322,941

CAR CONSTRUCTION

Filed June 21, 1941

3 Sheets-Sheet 1

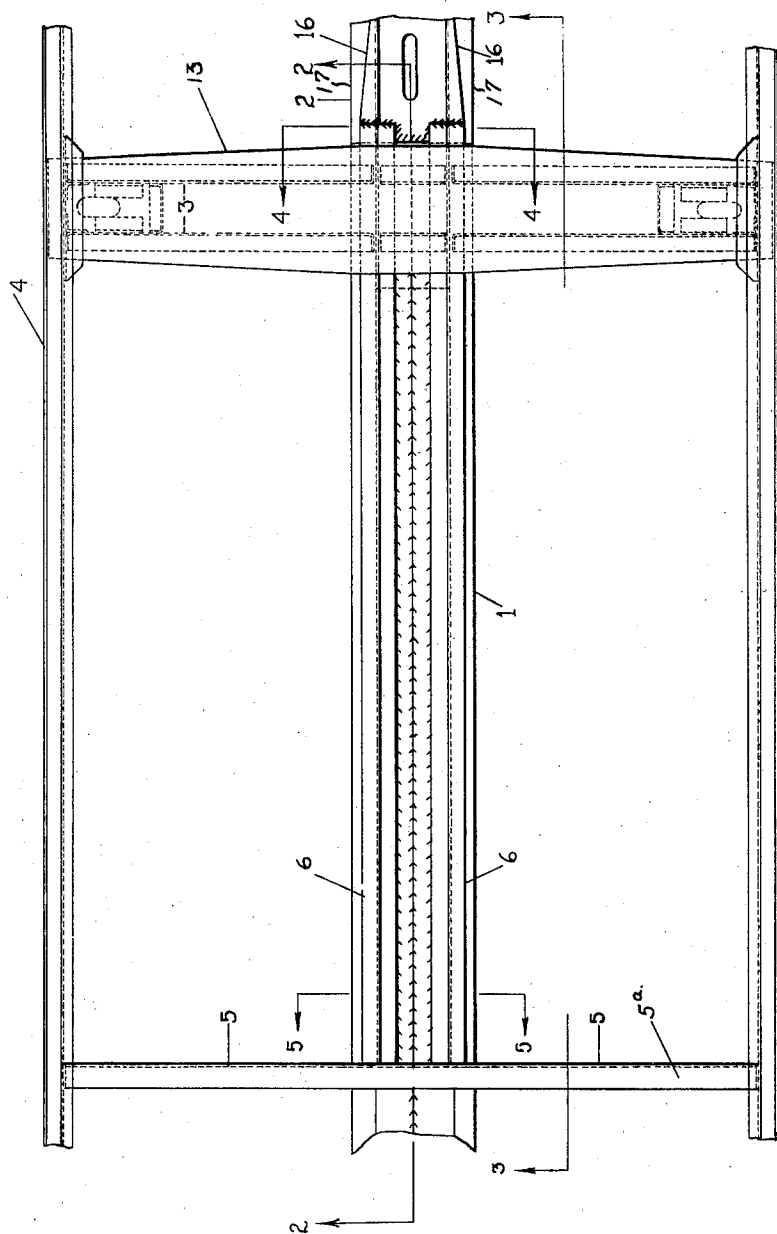


FIG. 1

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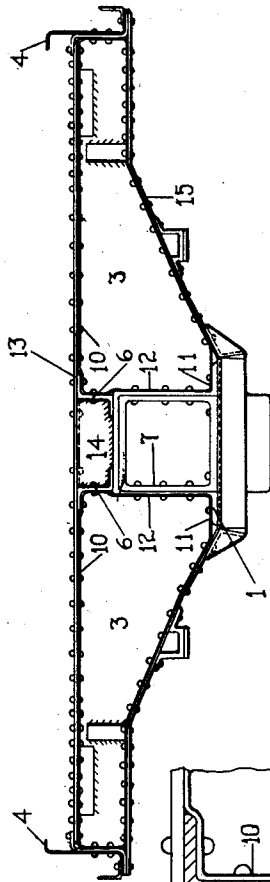


FIG. 4

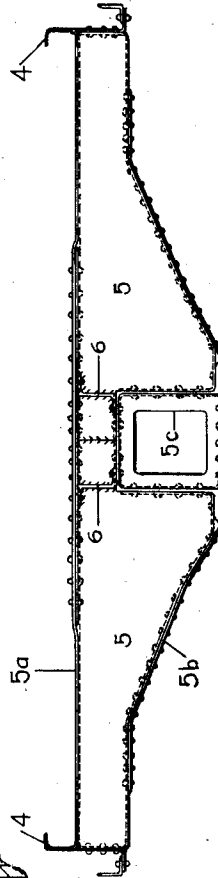


FIG. 5

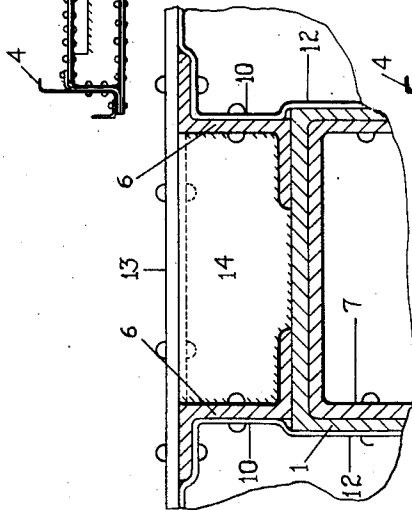


FIG. 6

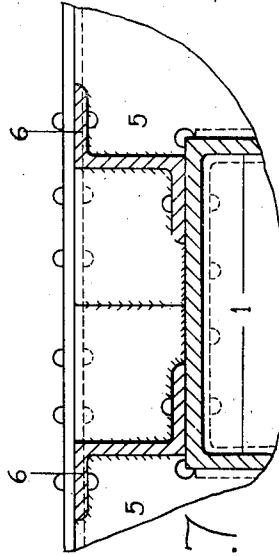


FIG. 7

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CAR CONSTRUCTION

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Application June 21, 1941, Serial No. 399,098

6 Claims. (Cl. 105—416)

Our invention pertains in general to railroad passenger cars and specifically to the car underframe. In the particular type of underframe hereunder consideration, the underframe side sills combine with the body side wall construction to form girders which carry the weight of the car body and passengers. These body side wall girders transmit their loads through the car bolsters to the car center sill. The center sills at the bolsters are supported on the car trucks. From the foregoing, it is apparent that the center sills may thus function primarily as a column to absorb buffing and draft stresses imposed upon the car when in operation.

Due to the high rate of speed of operation of these cars, including quick starting and stopping, the center sill must absorb greater stress than heretofore necessary. There is also the necessity for absorbing sudden shocks of great intensity during any collision of these cars. To merely increase the size of the car parts is not an economic solution because of the expense involved in hauling excess weight. It is also undesirable to use the body side wall girders to absorb these additional operation shocks as this would necessitate increased weight in the car body.

One object of our invention is to provide a new and novel center sill construction having increased buffing capacity.

Another object of our invention is to provide a novel center sill and bolster construction providing a strong and rigid connection with the spring buffing means mounted at each end of the center sill.

These and further objects of the invention will be made apparent as the description proceeds. In the drawings forming part of these specifications, Fig. 1 shows a plan view of a portion of the car underframe including the end buffing casting, bolster and an intermediate crossbearer; Fig. 2 shows a section longitudinally of the underframe at the center line therefor as indicated by lines 2—2 on Fig. 1; Fig. 3 shows a section longitudinally of the underframe as indicated by lines 3—3; Fig. 4 shows a transverse section through the underframe in front of the bolster and indicated by lines 4—4 on Fig. 1; Fig. 5 shows a transverse section through the underframe at the crossbearer as indicated by lines 5—5 on Fig. 1; Figs. 6 and 7 show enlarged details of portions of Figs. 4 and 5 respectively.

Referring now in detail to the drawings wherein like reference characters refer to like parts; reference character 1 indicates the cen-

ter sill comprised of two Z-bars having opposing top flanges welded together and oppositely disposed bottom flanges. The center sill 1 does not extend the full length of the underframe and has a buffer casting 2 mounted in each end of the sill to form part of the ends of the underframe. Disposed transversely of the underframe and inwardly from each end of the sill 1 is a bolster including pairs of spaced diaphragms 3 extending from opposite sides of the center sill to the underframe side sills 4. Disposed behind each bolster and in spaced relation thereto are crossbearers comprised of diaphragms 5 extending from opposite sides of the center sill 1 to the adjacent side sills 4 and having portions extending across the center sill to the longitudinal center of the car, where these latter portions are welded together to form the crossbearer as an integral member. A top plate 5a and bottom plate 5b connect the diaphragms 5 to the center and side sills. Within the center sill and between the diaphragms 5 is a center sill separator 5c. Mounted on the top of the center sill and extending from the crossbearer 5 to the buffer casting 2 are reinforcement members 6 preferably in the form of Z-bars united with the bolsters 3.

The buffer casting 2 may be of any suitable form and may be an integral part of the car end and platform casting (not shown). Within the buffer casting 2 are mounted suitable draft gear of any usual form. This buffer casting extends between the end of the center sill 1 and the end of the car underframe. A portion 7 of the buffing casting which is of box section is disposed within the end of the center sill and between the bolster diaphragms 3 to form the bolster center brace. This portion 7 of the buffer casting within the center sill engages the side and top walls of the center sill and is preferably welded thereto as indicated by reference characters 8. Adjacent the outer end of sill 1 and extending thereabove are ribs 16 of angular shape integrally formed on buffer casting 2. These ribs 16 abut Z-bars 6 as hereinafter described. At the bottom of buffer casting 2, in alignment with the bottom flanges of center sill 1, are flanges 17 terminating adjacent the ends of the sill bottom flanges and welded thereto. It is also desirable to weld the end of the web of the center sill 1 to the end casting 2 as clearly indicated in Fig. 3 of the drawings. In this manner the end of the center sill through its web, bottom flanges, and the projecting ends of the sill reinforcing member 6 is integrally connected

to the buffer casting 2. The bolster diaphragms 3 are also secured to the center sill and buffer casting portion 7 by suitable means indicated by reference character 9.

The center sill reinforcing members 6 which are angular in form and shown as Z-bars are secured to the top of the center sill by any suitable means such as welding. These Z-bars 6 have their bottom flanges engaging the center sill, their vertical webs in line with the side walls of the buffer casting and their top flanges extending outwardly above the center sill. As illustrated in Figures 2 and 3, the buffer casting projects above as well as into the end of the center sill and the Z-bars 6 project beyond the end of the center sill into engagement with the top of the box section 7 and the angular section of the buffer casting ribs 16 for welded connection thereto. As illustrated in Figures 1 and 5, the members 6 extend through the bolster and along the center sill to the crossbearer 5 to which they are welded.

The bolsters adjacent each end of the center sill comprise spaced apart pairs of diaphragm members 3 placed back to back and extending from each side of the center sill to the side sills. Each diaphragm 3 extends vertically between the top flange of the center sill reinforcing member 6 and the bottom flange of the center sill and is provided with a peripheral flange one side 10 of which is secured to the said top flange and one side 11 of which is secured to said bottom flange. This diaphragm peripheral flange has a portion 12 disposed against the webs of the center sills and Z-bars 6 and secured thereto. As shown in Figure 4, the same rivets connecting the buffer casting to the center sill also connect the bolster diaphragm flange to the center sill. Each bolster is provided with a top plate 13 extending from side sill to side sill connecting the top flanges of the bolster diaphragms 3 and the top flanges of the center sill reinforcing members 6. Disposed transversely of the center sill between the reinforcing members 6 are spaced angular members 14. These members 14 preferably have a vertical leg disposed in the vertical plane of the webs of the opposed bolster diaphragms 3 and a horizontal leg disposed beneath the bolster top plate 13. These members 14 are preferably welded to the center sill and center sill reinforcing Z-bars 6. They are also preferably riveted to the bolster top plate 13 as illustrated in Figs. 3 and 4. The bottom flanges of the bolster diaphragms are connected by a bottom plate 15 extending from side sill to side sill and secured to the bottom flanges of the center and side sills.

From an inspection of the drawings and the foregoing description it will be apparent that any buffing stresses imposed upon the buffing casting 2 will be transferred directly into the center sill 1 which is reinforced by Z-bars 6. These latter reinforcing Z-bars 6 are tied into the bolster and buffing casting so that the entire structure acts as a unit.

Having thus described the invention what we claim as new and desire to secure by Letters Patent is:

1. In a car underframe in combination, a center sill terminating inwardly of each end of the underframe, an end and draft casting secured to each end of and forming continuations of the center sill and having portions projecting above the center sill; a bolster member extending across the underframe inwardly of each end of the center sill; center sill reinforcing members secured to

the top face of the center sill at each end thereof, said reinforcement members forming abutments for the end casting projecting portions and terminating between the bolsters.

2. In a car underframe in combination, a center sill, draft and buffing members at each end of said center sill and connected thereto forming continuations thereof; a bolster adjacent each end of said center sill and comprising diaphragm members extending laterally from the opposite sides of the said center sill and extending vertically above said center sill; a transversely disposed member secured to the center sill in inwardly spaced relation to each said bolster and extending continuously across the center sill; angularly shaped reinforcing members secured to the top of the ends of the center sill adjacent each side thereof, the opposite ends of each said reinforcing member being connected respectively to the adjacent draft and buffing members and the said transversely disposed member, and a connection between said bolster diaphragm members and the adjacent center sill reinforcement members.

3. In a car underframe, a center sill terminating short of the ends of the underframe, an end buffing and draft member connected to each end of the center sill and extending to the adjacent end of the underframe; portions on said draft and buffing members extending above the horizontal plane of the top of the center sill in outward spaced relation to the end of the center sill; reinforcing members for said center sill and said members being secured to the top of the center sill and extending beyond the ends thereof for connection with said upwardly extending member portions, each said reinforcing members having top flange portions extending laterally outward of the center sill; a pair of spaced bolster diaphragms at opposite sides of the center sill inwardly from each end thereof, each said bolster diaphragms extending between the top flange of the reinforcing member and the bottom of the side sill and secured to the side sill and said member; an angular member having a vertical web portion disposed between said reinforcing members in alignment with the webs of the bolster diaphragms on opposite sides of the center sill and connected with said reinforcing members, and top and bottom cover plates connecting said bolster diaphragms above and beneath the center sill.

4. In a railway car underframe, a center sill, a draft member at each end thereof having a portion extending within the end of the sill for connection thereto and portions extending above the plane of the top of the sill in outward spaced relation to the adjacent end of the sill; reinforcing members secured to the top of said sill and extending outwardly from the end thereof, and a connection between the latter ends of said reinforcing members and said upwardly projecting portions of the draft members.

5. In a railway car underframe, a center sill terminating short of the ends of the underframe and comprising spaced members having opposing abutting top flanges and outwardly extending bottom flanges; an end buffing and draft member extending between each end of the center sill and the adjacent end of the underframe, each said latter members having bottom flanges abutting and secured to the adjacent center sill flanges and a top portion projecting above the center sill top flanges; reinforcing members secured to the top flanges of the center sill members adjacent

each said end member and connected to said upwardly projecting top portions thereof.

6. In a car underframe, a center sill formed of angular members having connected substantially abutting top flanges and oppositely disposed bottom flanges; a draft member mounted within one end of the center sill and having upwardly extending angular portions spaced outwardly of the end of the center sill; angular reinforcing members secured to the top flanges of the center sill and disposed in alignment with said draft member upwardly extending portions, a connection between said center sill angular reinforcing members and corresponding aligned portions of the draft member; bolster diaphragms disposed in pairs on opposite sides of the center sill and

secured thereto and to the inserted end of the draft member, top and bottom flanges on said pairs of bolster diaphragms being oppositely disposed for lapping and being secured to the center sill reinforcing members and center sill bottom flanges respectively; angular members secured to the center sill top flanges between said reinforcing members therefor and in alignment with said bolster diaphragm webs and top flanges on opposite sides of the center sill, and cover plates connecting said bolster diaphragms on opposite sides of the center sill to the center sill through said reinforcing members, interposed angular members and center sill top flanges.

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