July 13, 1943. A. H. OELKERS 2,324,267

TRUCK

Filed Dec. 20, 1940 2 Sheets-Sheet 1

Fig. 1.

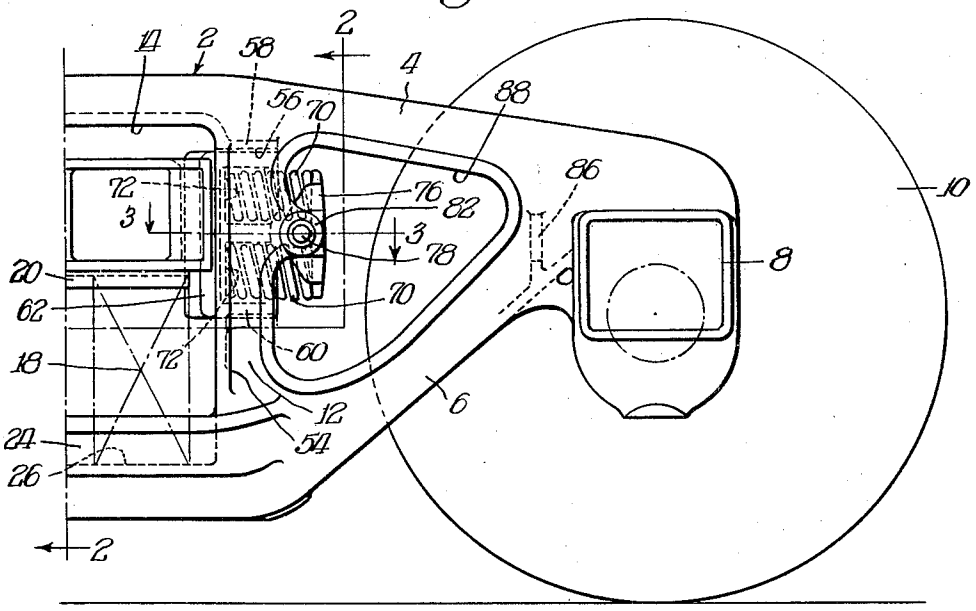
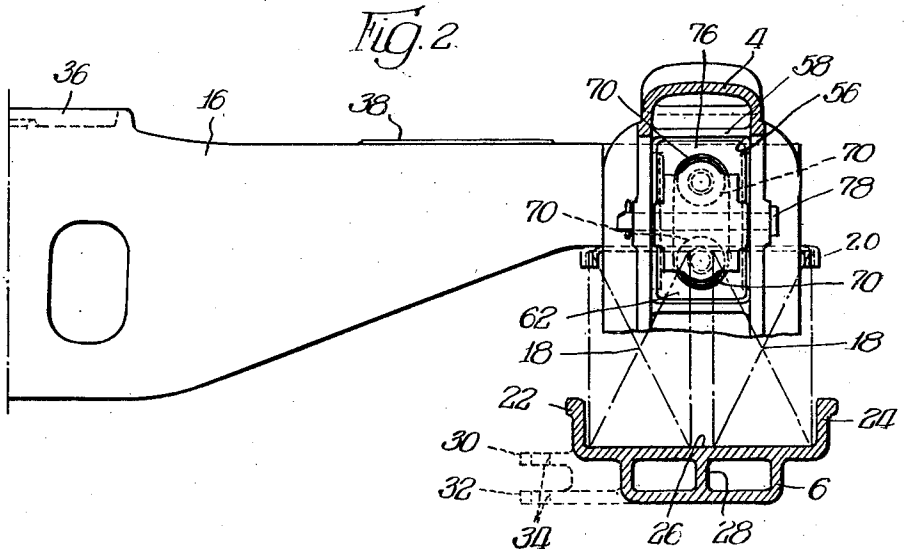


Fig. 2.



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Fig. 3.

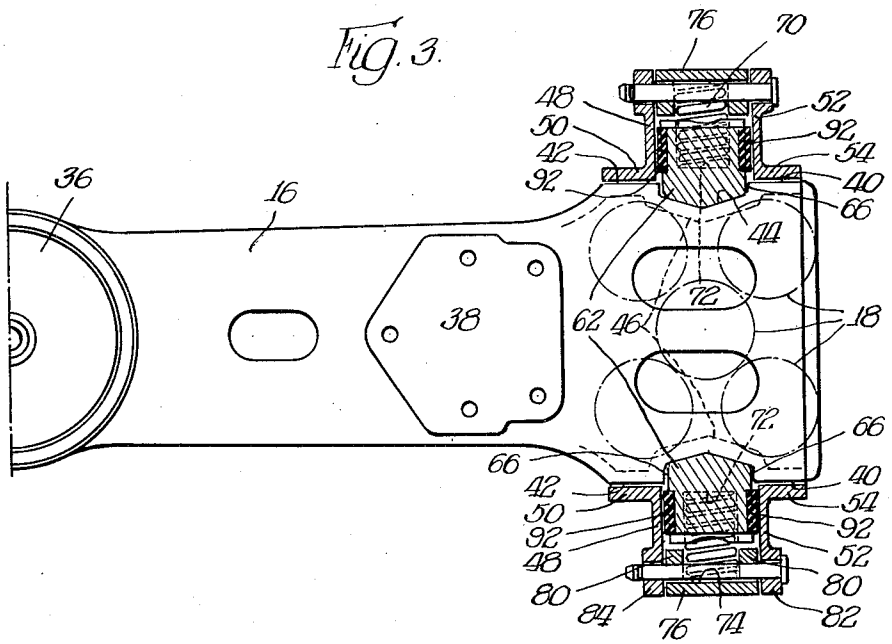


Fig. 4

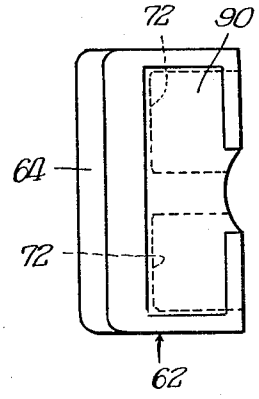
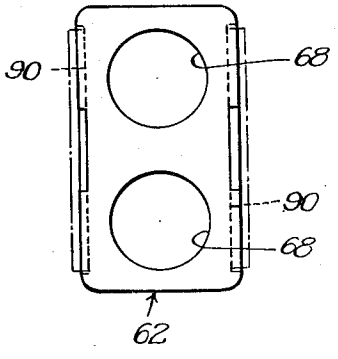


Fig. 5



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UNITED STATES PATENT OFFICE

2,324,267

TRUCK

Alfred H. Oelkers, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application December 20, 1940, Serial No. 370,949

21 Claims. (Cl. 105—197)

My invention relates to railway freight car trucks and more particularly to a novel form of such truck wherein means are afforded for damping spring oscillations. At present, it is well recognized that some means is necessarily associated with ordinary coil springs when used as load supporting means in modern freight cars if such springs are to be prevented entering into synchronous vibrations which are very destructive to car body and to lading. Many devices for snubbing such spring action have been placed upon the market in recent years and these have varied from relatively simple methods to rather complicated structures involving significant changes in the form of structure of the truck parts.

The general object of my invention is to devise a snubbing arrangement for railway freight car trucks which will efficiently and effectively accomplish the desired purpose while, at the same time, departing as little as possible from present well-accepted and well-known forms of truck structure.

The specific object of my invention is a four wheel truck structure embodying truss side frames and a load carrying member or bolster extending therebetween wherein unusually large squared surfaces are afforded between the side frame columns and bolster guide surfaces and wherein adjustable means are associated with each column which act as bolster tie means to prevent the accidental removal of the bolster from the bolster opening in the side frame.

My invention contemplates such an arrangement as that described wherein the bolster is afforded relatively large V-shaped friction surfaces adjacent each column which may be engaged by a V-shaped friction block resiliently supported in each column, said block normally serving as the means of connecting the bolster to the side frame and under ordinary conditions preventing the bolster from assuming an unsquare relationship with the side frame. At the same time, my novel arrangement is such that undue out-of-squareness between the bolster and side frame is prevented even if the said block should be excessively worn and thus not serve the squaring purpose so well as when originally applied.

My novel arrangement also is such as to permit a limited amount of lateral motion between the bolster and the side frame, said lateral motion however being subjected to resistance by compression of resilient pads between the bolster guide blocks and the adjacent columns.

The novel arrangement which I have devised contemplates the use of present well-known equipment for application or removal of various parts when it is desired to make a wheel change or when dismantling of the truck may be undertaken for whatever purpose.

Figure 1 is a side elevation of a four wheel truck structure embodying my invention, only one-half the structure being shown inasmuch as the structure is similar at opposite ends of the truck.

Figure 2 is an end elevation, partly in section, of my novel truck structure, the section being taken substantially in the vertical planes indicated by the line 2—2 of Figure 1.

Figure 3 is a fragmentary top plan view of the truck structure shown in Figures 1 and 2, also partly in section, the section being taken in the horizontal plane indicated by the line 3—3 of Figure 1, with the bolster in plan view.

Figures 4 and 5 show in detail my novel form of bolster guide and friction block, Figure 4 being a side elevation thereof, and Figure 5 an end view.

In each of the views, certain details may be omitted for the sake of clarity where they are more conveniently shown in other views.

Describing in detail my novel truck arrangement, the truck structure comprises the side frame 2 of usual truss form with the compression member 4 and the tension member 6 merging adjacent their ends with the integrally formed journal box 8 affording the usual means of connection with the wheel and axle assembly 10. Also integral with the tension and compression members is the column 12 of special form to be hereafter more particularly described, said column defining with the tension and compression members a bolster opening 14 within which may be received the end of the bolster 16. The bolster end may be seated in the ordinary manner upon the spring group diagrammatically indicated at 18, said spring group having at the top positioning means in the form of the spring plate 20 and being confined at the bottom of the bolster opening by the upright inboard and outboard flanges 22 and 24 rising from the widened spring seat portion 26 of the tension member 6, said spring seat being formed over the central box-section of said tension member and said box-section being reinforced by the longitudinal vertical strut 28 positioned along the longitudinal center line of said box-section. On the inboard side of said box-section may be formed integral top and bottom lugs 30 and 32 with aligned

openings 34, 34 as means of securing a tie bar between the side frames at opposite sides of the truck.

The main body portion of the bolster 16 is of usual form having the center bearing 36 and the side bearing 38, but the end portion of the bolster is modified to accommodate my novel form of interlocking means. It may be noted that the bolster end is of full box-section being formed with vertical flat faces of large area for engagement with inboard and outboard portions of the adjacent columns as indicated at 40, 40 at the outboard side of the frame (Figure 3) and at 42, 42 on the inboard side. Between the plate guide surfaces 40 and 42 on each side of the bolster is formed a friction surface 44 of shallow V-shape, said friction surface being defined by two vertical faces intersecting in the plane defining the longitudinal center line of the side frame, said V-shaped friction surfaces being formed on the outer face of each lateral wall of the bolster. The lateral wall of the bolster may be thickened or reinforced as indicated at 46 (Figure 3) in order to compensate for possible frictional wear of the outer faces thereof.

Each column comprises an inboard L section with the wall 48 and the flange 50 opposite the surface 42 on the adjacent side of the bolster as well as an outboard L section comprising the wall 52 and the flange 54 opposite the beforementioned guide surface 40 on the side wall of the bolster. In each column is formed a rectangular opening 56 defined at the top by the horizontal transverse wall 58, at the bottom by the horizontal transverse wall 60, and at the sides by the beforementioned inboard and outboard walls 48 and 52 of the beforementioned L sections. Each of said rectangular column openings 56 may conveniently receive my novel form of guide block and friction shoe generally designated 62 (Figures 4 and 5). Each of said guide blocks 62 is of box-like form having a V-shaped surface 64 complementary in form to the beforementioned surfaces on the side walls of the bolster and having slight lateral clearance therein as indicated at 66, 66 (Figure 3), in order that some slight lateral play may be afforded the guide blocks within the vertical slots of the bolster. Inasmuch as side frames and bolsters are normally formed of cast steel, the guide blocks and friction shoes 62 may well be formed of cast iron hardened to produce smooth frictional engagement with the side wall of the bolster. Each of said guide blocks and friction shoes is of rectangular box-like form having a relatively thick wall back of the friction face 64 as best seen in the sectional view of Figure 3 and in the wall opposite may be formed the circular openings 68, 68 through which may be received compression springs 70, 70, the inner ends of said springs being seated as at 72 within the guide block and the outer ends of which may bear as at 74 against the spring cap 76 above and below the retaining pin 78, said retaining pin extending through the inboard and outboard ears 80, 80 formed on said spring cap, the pin opening through said ears being aligned with pin openings formed in the lugs 82 and 84 formed on the outboard and inboard column walls.

Directly opposite each spring cap 76 and adjacent the juncture of the tension and compression member is formed in the side frame an integral vertical web or seat 86 against which may be positioned a jack, the top end of which may seat against the spring cap 76 when it is desired to dismantle the snubbing device. By placing sufficient pressure on the spring cap to compress slightly the springs 70, 70 the retaining pin 78 may be removed, thus freeing the spring cap and permitting the springs to be taken out, after which the bolster guide block and friction shoe may be removed out of the column opening 56 and from the side frame, thereby disengaging the bolster from the side frame. Thus I have provided a quick wheel change form of truck in which, by tools readily at hand, my novel form of truck may be easily dismantled.

The inboard and outboard walls of each bolster guide block may be relieved in a rectangular area indicated at 90, 90 to afford seats for flat rubber pads or springs 92, 92 which may be received within said relieved areas and may bear against the walls 48 and 52 of the columns to restrain relative lateral motion between the side frame and the bolster.

It will be understood as already described that slight lateral play is permitted between the bolster and the side frame by virtue of the lateral clearance of each bolster guide block in the vertical slot formed in the side wall of the bolster; at the same time, any such relative lateral movement will be resisted by the friction developed by the engagement of the guide blocks against said side walls and movement of the bolster with respect to the side frame in an inboard or an outboard direction will tend to displace the guide blocks from their normal seating against the V-shaped surfaces on the side walls of the bolster, thus resisting any relative lateral movement between the side frame and the bolster.

The bolster guide blocks and friction shoes serve as interlocking means to tie together the side frame and bolster and, at the same time, the friction developed between said guide blocks and the side walls of the bolster acts as a means of damping synchronous vibrations which might otherwise be set up in the bolster springs 18, 18. The degree of friction developed to restrain the vertical movement of the bolster under the impetus of the supporting springs may be controlled by varying the form and capacity of the compression springs 70, 70 which normally urge the bolster guide blocks into engagement with the frictional side walls of the bolster.

While the bearing of the bolster guide blocks 62, 62 against the lateral walls of the bolster serve to assist in squaring the truck, that is, in retaining the bolster in squared relationship with respect to each side frame, yet, at the same time, any great variation from squaring is prevented by the relatively large areas 40 and 42 on the bolster which may bear against the opposing flanges 50 and 54 on the columns of the side frame.

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 railway car truck, a truss side frame having tension and compression members merging with spaced columns to form a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster guide blocks resiliently mounted in said openings for slidable movement longitudinally of said frame, a bolster

extending into said bolster opening in interlocking engagement with said blocks, said interlocking engagement comprising vertical V-shaped channels on the side walls of said bolster with friction faces therealong, complementary friction surfaces on said blocks in slidable engagement with said faces, and means resiliently restraining said blocks against lateral movement in said column openings, said last-mentioned means comprising rubber pads recessed in the walls of said blocks and bearing against the walls of the adjacent columns.

2. In a railway car truck, a truss side frame having tension and compression members merging with spaced columns to form a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster guide blocks resiliently mounted in said openings for slidable movement longitudinally of said frame, a bolster extending into said bolster opening in interlocking engagement with said blocks, said interlocking engagement comprising vertical V-shaped channels on the side walls of said bolster with friction faces therealong, complementary friction surfaces on said blocks in slidable engagement with said faces, and means resiliently restraining said blocks against lateral movement in said column openings.

3. In a four wheel railway car truck, a truss side frame having tension and compression members and spaced columns forming a bolster opening, said columns having centrally thereof rectangular openings aligned longitudinally of the frame, a bolster guide block resiliently mounted in each of said openings for sliding movement longitudinally of the frame, a bolster end extending into said bolster opening in interlocking engagement with said guide blocks, said interlocking engagement comprising vertical V-shaped slots on the side walls of said bolster with friction surfaces therealong, complementary friction faces on said blocks engaging said surfaces, and means resiliently restraining said blocks against lateral movement in said columns.

4. In a four wheel railway car truck, a truss side frame having tension and compression members and spaced columns forming a bolster opening, said columns having centrally thereof rectangular openings aligned longitudinally of the frame, a bolster guide block resiliently mounted in each of said openings for sliding movement longitudinally of the frame, a bolster end extending into said bolster opening in interlocking engagement with said guide blocks, said interlocking engagement comprising vertical slots in the side walls of said bolster with friction surfaces engaging complementary friction faces on said blocks, and means resiliently restraining said blocks against lateral movement in said columns.

5. In a four wheel railway truck of quick wheel change type, a truss side frame having a compression member, a tension member merging at corresponding ends with an integrally formed journal box, integral columns defining with said members a central bolster opening, a bolster end extending into said opening, said bolster end having vertical channels adjacent said columns, and interlocking members resiliently mounted in said columns and projecting into said vertical channels to maintain said side frame and bolster end in normal operative relationship, each of said interlocking members being a box-like structure, and each of said columns having a rectangular opening in which said box-like structure may have sliding movement longitudinally of the side frame, said box-like structure having means resiliently restraining said structure against lateral movement in said columns.

6. In a four wheel railway truck of quick wheel change type, a truss side frame having a compression member, a tension member merging at corresponding ends with an integrally formed journal box, integral columns defining with said members a central bolster opening, a bolster end extending into said opening, said bolster end having vertical channels adjacent said columns, and interlocking members resiliently mounted in said columns and projecting into said vertical channels to maintain said side frame and bolster end in normal operative relationship, each of said interlocking members having a V-shaped friction face in engagement with the associated vertical channel, and resilient means controlling lateral movement of said interlocking members.

7. In a four wheel railway car truck, a truss side frame having tension and compression members and spaced columns forming a bolster opening, said columns having centrally thereof rectangular openings aligned longitudinally of the frame, a bolster guide block resiliently mounted in each of said openings for sliding movement longitudinally of the frame, a bolster end extending into said bolster opening in interlocking engagement with said guide blocks, said interlocking engagement comprising vertical V-shaped slots on the side walls of said bolster with friction surfaces therealong, and complementary friction faces on said blocks engaging said surfaces, said guide blocks having a plurality of resilient members on three sides thereof, one of said members urging said blocks into engagement with said bolster end, and the others restraining said blocks against lateral movement in said rectangular openings.

8. In a railway car truck, a truss side frame having tension and compression members merging with spaced columns to form a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster guide blocks resiliently mounted in said openings for slidable movement longitudinally of said frame, a bolster extending into said bolster opening in interlocking engagement with said blocks, said interlocking engagement comprising vertical slots in the side walls of said bolster with friction faces in engagement with friction faces on said blocks, and means resiliently restraining said blocks against lateral movement in said column openings.

9. In a four wheel railway car truck, a truss side frame having tension and compression members and spaced columns forming a bolster opening, said columns having centrally thereof rectangular openings aligned longitudinally of the frame, a bolster guide block resiliently mounted in each of said openings for sliding movement longitudinally of the frame, and a bolster end extending into said bolster opening in interlocking engagement with said guide blocks, said interlocking engagement comprising vertical slots in the side walls of said bolster with friction surfaces engaging complementary friction faces on said blocks, said blocks having means characterized by rubber pads recessed in the outer walls thereof resiliently restraining said blocks against lateral movement in said rectangular openings.

10. In a four wheel railway car truck, a truss side frame comprising tension and compression members and spaced columns forming therewith

a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster interlocking members slidably mounted in said column openings, a bolster end extending into said bolster opening in interlocking engagement with said interlocking members, and resilient means restraining said interlocking members against lateral movement.

11. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, said columns having rectangular openings aligned longitudinally of said frame, bolster guide blocks mounted in said openings for movement longitudinally of said frame, resilient means restraining said blocks against lateral movement, spring caps pivotally mounted on said columns, compression springs between said blocks and said caps for urging said blocks toward each other for engagement with an associated bolster, and fulcrum seats on said frame adjacent opposite ends thereof opposite said spring caps.

12. In a railway car truck, a truss side frame having tension and compression members merging with spaced columns to form a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster guide blocks mounted in said openings for slidable movement longitudinally of said frame and resiliently restrained against lateral movement, and a bolster extending into said bolster opening in interlocking engagement with said blocks, said interlocking engagement comprising vertical slots in the side walls of said bolster with friction faces in engagement with friction faces on said blocks.

13. In a four wheel railway car truck, a truss side frame having tension and compression members and spaced columns forming a bolster opening, said columns having centrally thereof rectangular openings aligned longitudinally of the frame, a bolster guide block resiliently mounted in each of said openings for sliding movement longitudinally of the frame, a bolster end extending into said bolster opening in interlocking engagement with said guide blocks, and means resiliently restraining said blocks against lateral movement in said columns.

14. In a four wheel railway truck of quick wheel change type, a truss side frame having a compression member, a tension member merging at corresponding ends with an integrally formed journal box, integral columns defining with said members a central bolster opening, a bolster end extending into said opening, said bolster end having vertical channels adjacent said columns, and interlocking members resiliently mounted in said columns and projecting into said vertical channels to maintain said side frame and bolster end in normal operative relationship, said interlocking members having resilient means restraining said members against lateral movement.

15. In a four wheel railway car truck, a truss side frame having tension and compression members and spaced columns forming a bolster opening, said columns having centrally thereof rectangular openings aligned longitudinally of the frame, a bolster guide block resiliently mounted in each of said openings for sliding movement longitudinally of the frame, and a bolster end extending into said bolster opening in interlocking engagement with said guide blocks, said blocks having resilient means restraining said blocks against lateral movement.

16. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, said columns having rectangular openings aligned longitudinally of said frame, bolster guide blocks mounted in said openings for movement longitudinally of said frame and resiliently restrained against lateral movement therein, spring caps mounted on said columns and pivoting on an axis transverse of said frame, and resilient means between each of said blocks and the associated cap for urging said blocks toward each other for engagement with an associated bolster.

17. In a four wheel railway car truck, a truss side frame comprising tension and compression members and spaced columns forming therewith a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster interlocking members slidably mounted in said column openings and extending into said bolster opening, a plurality of resilient members restraining said interlocking members against lateral movement, and a bolster end extending into said bolster opening in interlocking engagement with said interlocking member.

18. In a railway car truck, a truss side frame having tension and compression members merging with spaced columns to form a central bolster opening, openings in said columns aligned longitudinally of said frame, bolster guide blocks resiliently mounted in said openings for slidable movement longitudinally of said frame, resilient means controlling lateral movement of said blocks, and a bolster extending into said bolster opening in interlocking engagement with said blocks.

19. In a railway car truck, a side frame comprising a column and windows, a bolster end in one of said windows, an opening in said column, and a guiding member in said opening resiliently restrained against lateral movement therein, said guiding member being interlocked with said bolster end.

20. In a railway car truck, a side frame having a column and windows, an opening in said column, a spring cap rockably mounted on said column on an axis transverse of said frame, a bolster end in one of said windows, guiding means extending through said opening and resiliently restrained against lateral movement therein, and a spring between said cap and said means urging said means into contact with said bolster.

21. In a railway car truck, a side frame comprising a column and windows, a bolster end in one of said windows, an opening in said column, a guiding member in said opening, resilient means pressing said member against said bolster end, supporting means for said resilient means, said supporting means pivoting on an axis transverse of said frame, and resilient members controlling lateral movement of said guiding member.

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