Jan. 24, 1956 G. F. COUCH 2,731,923

RAILWAY TRUCK

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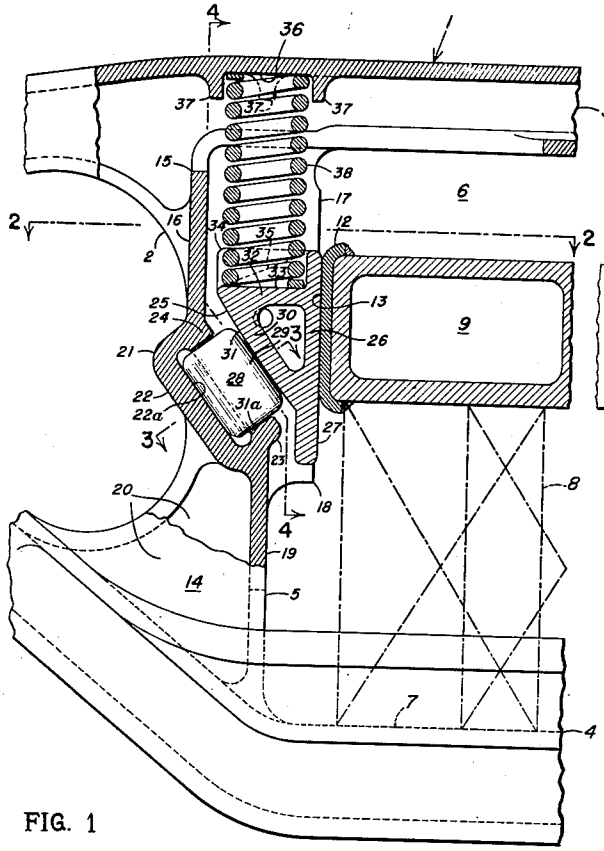


FIG. 1

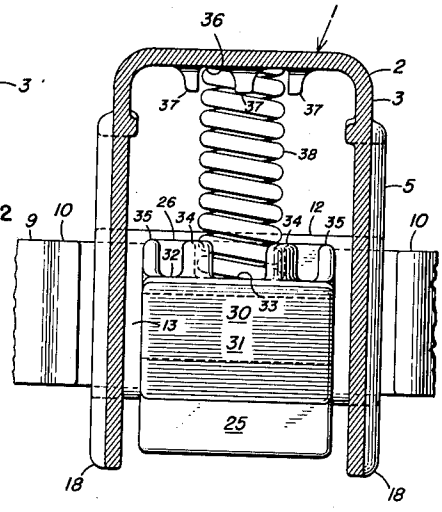


FIG. 4

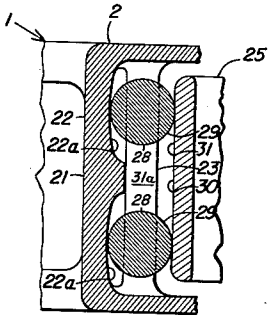


FIG. 3

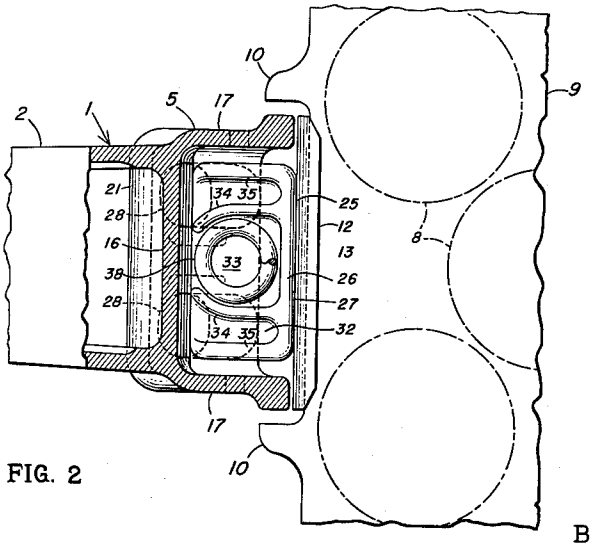


FIG. 2

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RAILWAY TRUCK

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23 Claims. (Cl. 105—197)

This invention pertains to a railway truck and more patricularly to a type thereof wherein a vertical movement of a bolster is controlled or snubbed.

An object of the invention is the provision, in an improved railway truck of a bolster so arranged with related components that it will execute a relatively free lateral motion while its vertical motion will be snubbed or controlled.

Another object of the invention is the provision, in an improved railway truck, of a rollable means carried by a side frame and in turn carrying a friction element which is arranged to move laterally with a bolster member but remains substantially stationary as the bolster member executes a vertical movement to thereby frictionally engage the bolster member and snub or control such vertical movement.

The above and numerous other objects of the invention will become apparent from the succeeding description of an exemplified form of the invention illustrated in the accompanying drawings, wherein:

Figure 1 is a vertical sectional view of a portion of a railway truck embodying the present invention.

Figure 2 is a horizontal sectional view taken along the lines 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a transverse sectional view taken along the lines 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a vertical cross-sectional view taken along the lines 4—4 of Figure 1 looking in the direction of the arrows.

Referring now in detail to the drawing wherein like reference characters indicate like parts, the numeral 1 is employed, in a somewhat general manner, to designate a portion of a railway truck embodying a characterized form of the present invention. The railway truck comprises a side frame 2 having a top or compression member 3 spaced above a bottom or tension number 4 with these two members joined together on each side of a transverse vertical plane of the truck by columns or strut members 5 only one of the latter being shown in the drawing. All the members are joined together to form an integral, unitary structure and define or present a window opening 6 therebetween. The tension member, between the columns, is horizontally disposed to present a spring well or seat 7 for the accommodation of a nest of springs 8, the latter of which being illustrated diagrammatically only because it forms no part of the present invention. Mounted upon the nest of springs is a bolster only an extremity 9 of which is illustrated; it being clearly understood that the bolster functions as a load carrying member extending between and forming a connection of mated or related side frames. The bolster is of the lateral motion type and to offer an execution of such motion the bolster end is provided with lugs 10 outstanding from each side wall of the bolster extremity, inwardly and outwardly of the side frame, and spaced a predetermined distance from a related column so that the distance between the lugs and related columns is determinative of the permissible lateral motion of the bolster. The lugs at each side of the bolster end define a recess into which a related column extends and in which is positioned a chafing or hardened plate 12, suitably secured to the bolster to present a renewable wear plate having an outwardly exposed brushing surface or face 13. The brushing face is desirably a plane, vertically directed surface against which another component, hereinafter described, bears.

Each column is made as a somewhat compound structure in that a lower portion 14 is desirably of channel section and opening toward an end of the side frame while an upper portion 15 is also of channel section and opening inwardly toward the window opening. As such, the latter comprises a web 16 vertically directed and extending transversely of the side frame to have its lateral edges merge into inboard and outboard flanges 17 which extend, longitudinally of the side frame, in parallel relation, toward the bolster but, however, terminate short of the bolster so as not to interfere with an otherwise free lateral motion thereof. These inboard and outboard flanges extend vertically from the compression member downwardly to stop short of the tension member but still extend to and into or overlap the lower portion 14 as an integral part of the latter as at 18. The lower portion of the column is formed by an inner web 19 extending vertically and upwardly from the tension member to terminate short of the web 16 and in horizontally spaced relation thereto. The lower portion is also provided with inboard and outboard flanges 20, which in effect form extensions or continuations of the upper portion flanges and desirably in vertical alignment therewith, however extending toward the related end of the side frame from the associated web.

Forming a part of each column proper and located at the juncture of the upper and lower portions thereof is a pocket or cage 21 defined by or comprising an inclined wall 22 which slopes, preferably at an angle of thirty-seven and one-half degrees. The inclined wall extends between and transversely of the side frame inboard and outboard flanges to merge therewith and form an integral part thereof. The bottom or inclined wall has its lower and upper limits or terminals merging with a lower lip or supporting ledge 23 and an upper lip or confining ledge 24 respectively. These ledges are desirably normal to the inclined wall and therefore are also inclined but in a direction toward the bolster to form a part of or merge with the respective webs of the column. Thus it will be noted that each column cage or pocket opens upwardly or vertically of the side frame and inwardly or horizontally toward the bolster as clearly illustrated in Figure 1 of the drawing.

Since the bolster is supported by the nest of springs 8 and this nest is desirably made up of a group of coil springs, the external impulses transmitted to the side frame will, under certain well known conditions, synchronize with the period of vibration of the coil springs. If some means is not incorporated in the truck to snub the action of the springs, the spring vibrations will attain such magnitude that the components of the truck will, in service, be damaged. In order to snub or control the action of the bolster supporting springs there is housed in each column, a wedge or shoe 25 substantially triangular in formation and provided with a vertical wall 26. This vertical wall is of a vertical dimension in excess of the overall vertical height of the bolster chafing plate and presents an outwardly exposed rubbing face or surface 27 vertically disposed and in bearing relation or frictional contact with a related brushing face of the bolster chafing plate. It is to be noted that the rubbing face extends vertically for a distance equal to or greater than the contemplated or anticipated vertical

movement of the brushing face so that frictional forces will be created on the brushing and rubbing faces throughout the entire range of bolster vertical movement.

In actual service the truck, particularly the side frames due to the irregularities in the rails, is caused to lurch transversely of the track or rails and if such transverse actions or forces are permitted to be transmitted to the bolster, then the car body (not shown) will also lurch or be moved transversely of the rails with the obvious disastrous result flowing therefrom. In order to prevent or minimize such transversely directed forces being transmitted to the bolster, the present arrangement is such that a relatively free transverse movement between the side frame and bolster is permitted. Toward the accomplishment of the last feature, there is provided a pair of rollable means or more particularly transversely spaced cylindrical rollers **28** each having an axis inclined and parallel to the cage inclined wall **22**. The rollers are positioned in the column pocket and have a top flight **29** thereof out of the range or reach of the pocket. The wedge has, extending at an angle to the vertical wall, an inclined roller seat wall **30** bearing upon and spanning or bridging the rollers so that any force applied to the wedge will be reflected in a horizontal component urging the wedge vertical wall against the bolster chafing plate. As clearly viewed in Figure 3 it will be noted that the wedge is of less transverse dimension than the clear opening of the accommodating column or in other words the transverse distance between the column flanges **17** and accordingly the bolster and wedge are arranged to move relatively to the side frame without any substantial restraining forces acting therebetween.

In order to insure a full surface bearing relation between the rubbing and brushing faces, the inclined roller seat wall has an exposed arcuate surface **31** in bearing relation with the rollers and therefore, theoretically at least, only a point contact exists between the rollers and wedge so that the wedge is free to adjust itself to insure a full bearing between the rubbing and brushing faces. The cage inclined wall is provided with arcuate or concave ways or seats **22***a* defining the bottom of the pocket and along which the rollers may move. This arrangement is believed desirable in that during a relative transverse movement of the bolster and side frame, the rollers will be urged to the higher portions of the ways and result in a lifting action being transmitted to the bolster to control such movement. Also when the bolster and side frame have moved relatively and transversely this relationship is, while usual, not normal and the rollers being on the higher portions of the ways, as soon as the forces causing such movements have been spent, the rollers will be caused to roll to the lower portions of the ways to bring all the parts back to normal position or relationship. Supporting the rollers within the cage, since the former are disposed at an incline, is the cage lip and this component is provided with a crowned or convex surface **31***a* so that, also at least theoretically, only a line contact exists between the engaging roller ends and convex surface to enhance the freedom of roller action.

Various arrangements suggest themselves for urging the wedge into wedging engagement with the rollers and bolster but the preferred means is reflected in the drawing by providing a base wall **32** on the wedges forming a horizontal connection between an end of the roller seat wall and the vertical wall. The base wall has an unwardly facing spring seat **33** which is defined, at least in part by curved fingers **34** upstanding from the base wall. Gussets or knee braces **35** also rise from the base wall along its lateral edges to merge with a related portion of the vertical wall to thus reinforce the vertical wall against stresses to which it will be subjected in service.

A spring seat **36** is formed on the side frame compression member and preferably in vertical alignment with the wedge spring seat when the latter is in normal position. Spaced quadrantly about the compression member spring seat are downstanding lugs or shoulders or spring positioning means **37**. A spring means of any nature or character and illustrated as a simple coil or compression spring **38** is interposed between and arranged to react against the vertically aligned spring seats and since the spring **38** is introduced to its position under an initial compression, it functions as the simplest means for accomplishing the office intended by this component.

It is to be noted that, as the bolster and side frame are relatively displaced transversely of the truck and one end of the coil spring is fixed to the side frame and the other end is fixed to the wedge, the coil spring is somewhat distorted and this added stored energy will also assist in returning the bolster and side frame to their normal relationship.

From the above it will be noted that various changes and alterations may be made to the illustrated and described construction without departing from the spirit of the invention and scope of the appended claims.

I claim:

1. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame opening upwardly and inwardly toward said bolster, an inclined roller seat in said pocket, rollers in said pocket and rollable laterally only of said side frame on said roller seat, and a spring-pressed shoe interposed between and acting against said rollers and bolster for snubbing a vertical movement of said bolster, said bolster being afforded relatively free lateral motion by said rollers.

2. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, an inclined pocket in a column of said side frame opening upwardly and inwardly toward said bolster, an inclined way defining a bottom of said pocket, inclined rollable means within said pocket and bearing on said way, said rollable means being arranged to roll transverse only of said side frame and interposed between said side frame and bolster, and spring pressed wedge means interposed between and acting against said rollable means and bolster; said wedge means and bolster being arranged to move relatively vertically and together transversely of said side frame.

3. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, an inclined pocket in a column of said side frame opening upwardly and inwardly toward said bolster, an inclined way extending transversely of said side frame and defining a bottom of said pocket, rollable means bearing on said way and arranged to move transversely of said side frame, said rollable means projecting from said pocket and providing a wedging surface on said side frame, and spring-pressed wedge means engaging said rollable means and bolster; said wedge means being arranged to move horizontally with and resist relative vertical movement of said bolster.

4. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, an inclined pocket in a column of said side frame, a lip defining one side of said pocket, rollable means within said pocket and retained therein by said lip, and a spring-pressed wedge means spaced from said lip and bearing against said rollable means and bolster, said wedge means on motion laterally of said side frame being in rolling contact with said rollable means and in frictional contact with said bolster and on motion in the plane of said side frame being in frictional contact with both said rollable means and bolster, said bolster carrying said wedge means along therewith during a lateral motion

thereof and being movable vertically relative to said wedge means.

5. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, an inclined pocket in a column of said side frame, a way defining a bottom of said pocket and facing toward said bolster, a lip defining one edge of said pocket and extending toward said bolster, rollable means bearing against said way and lip and having line contact with said way, and spring-pressed wedge means interposed between and acting against said rollable means and bolster for frictionally snubbing a vertical movement of said bolster; said wedge means being movable transversely of said side frame on said rollable means in response to a lateral motion of said bolster.

6. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, an inclined pocket in a column of said side frame, an inclined way defining a bottom of said pocket, an inclined lip defining a lower edge of said pocket and disposed normal to said way, rollable means bearing against said way and lip and arranged to move relative thereto transversely only of said side frame, and wedge means spaced from said lip and bearing against said rollable means and bolster; said wedge means and bolster being relatively movable vertically and movable together transversely of said truck.

7. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, an inclined pocket in a column of said side frame, an inclined way defining a bottom of said pocket, rollable means within said pocket and bearing upon and in line contact with said way, said rollable means being arranged to move transversely of said truck, wedge means within said column and bearing against said rollable means and bolster, and spring means interposed between said side frame and wedge means; said wedge means being arranged to move transversely of said truck with said bolster and to have said bolster move vertically relative thereto.

8. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame, an inclined way defining a bottom of said pocket, a lip normal to said way and defining an edge of said pocket, rollable means supported at an incline by said way and lip and forming a wedging face on said side frame, and spring-pressed wedge means movable toward said bolster and in frictional engagement therewith, said wedge means being carried by said rollable means and movable thereon transversely of said truck with said bolster, and said bolster being movable vertically relative to said wedge means.

9. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame, an inclined seat within said pocket, rollable means in said pocket and bearing upon said seat, means for retaining said rollable means in said pocket, said rollable means being adapted to move transversely only of said side frame, and a spring-pressed wedge interposed between and bearing upon said rollable means and bolster; said wedge frictionally engaging said bolster during a vertical movement of the latter; said bolster and wedge being arranged to move horizontally in unison on said rollable means.

10. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame, an inclined seat within said pocket, rollable means bearing upon said seat and arranged to move transversely only of said side frame, a wedge interposed between and bearing against said rollable means and bolster, and spring means within said column and bearing against said side frame and wedge; said wedge being movable with said bolster on said rollable means during lateral motion of said bolster; said bolster being movable relative to said wedge during vertical movement of the bolster.

11. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame, an inclined seat within said pocket and facing said bolster, rollable means bearing upon said seat, said rollable means projecting from said pocket and being arranged to move transversely of said side frame, a wedge spacing said rollable means and bolster, spring seats on said wedge and side frame, and spring means bearing against said spring seats for urging said wedge against said bolster and into sliding and rolling contact with said rollable means; said wedge being movable with said bolster during lateral motion of the latter; said bolster being vertically movable relative to said wedge.

12. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame, an inclined seat in said pocket facing in a direction toward said bolster, rollable means in said pocket and bearing at a substantially constant inclination upon said inclined seat, means defining said pocket supporting said rollable means, wedge means having a crowned inclined surface bearing against said rollable means and a plane surface bearing against said bolster, and spring means urging said wedge means surfaces against said rollable means and bolster; said wedge means being movable horizontally with said bolster on said rollable means; said bolster being movable vertically relative to said wedge means.

13. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame, an inclined arcuate seat in said pocket facing in a direction toward said bolster; rollable means within said pocket, said rollable means bearing upon said inclined arcuate seat and being rollable transversely only of said side frame, means supporting said rollable means within said pocket, wedge means having an arcuate surface bearing upon said rollable means and a plane surface frictionally engaging said bolster; vertically disposed spring seats on said side frame and wedge means, and spring means bearing against said spring seats.

14. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame opening longitudinally of said side frame toward said bolster, an inclined seat in said pocket facing toward said bolster, said inclined seat being curved transversely of said side frame, rollable means mounted on and having line contact with said inclined seat, means defining said pocket for retaining said rollable means therein, and a spring-pressed wedge means having a crowned inclined surface bearing against said rollable means and a plane vertically disposed surface bearing against said bolster; said bolster and wedge arranged to move in unison transversely of said truck by said rollable means; said bolster arranged to move vertically relative to said wedge means.

15. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a confined pocket in a column of said side frame and opening upwardly and longitudinally of said side frame, an arcuate inclined seat defining a bottom of said pocket and exposed in a direction toward said bolster, a plurality of inclined rollers of uniform transverse cross-section confined in said pocket and arranged to roll transversely of said side frame for

a limited distance, a wedge having an inclined arcuate surface bearing against said inclined rollers and a plane vertical surface bearing against a coplanar surface of said bolster, said wedge being spaced from said side frame by said rollers, a spring seat on said wedge, a spring seat on a compression member of said side frame and spaced from said first-named spring seat, and a coil spring interposed between and reacting against said spring seats.

16. In a railway truck of the type having a side frame and a lateral motion bolster, the combination of wedge means interposed between and acting against said side frame and bolster for frictionally resisting vertical movement of said bolster, and roller means of uniform transverse cross-section interposed between said wedge means and side frame and rollable transversely of said side frame for allowing relatively free movement in unison of said wedge means and bolster laterally of said side frame.

17. In a railway truck of the type having a pair of members movable relative to each other in a plurality of directions, the combination of rollable means carried by one of said members and rollable in one direction only relative thereto, a friction surface movable with said other member, and friction shoe means in frictional contact with said friction surface and in frictional and rolling contact with said rollable means for snubbing relative movement of said members in one direction while permitting relatively free movement therebetween in the rolling direction of said rollable means.

18. In a railway truck of the type having a pair of members movable relative to each other in a plurality of directions, the combination of rollable means carried by one of said members and rollable in one direction only relative thereto, a friction surface movable with said other member, friction shoe means in frictional contact with said friction surface and in frictional and rolling contact with said rollable means for snubbing relative movement of said members in one direction while permitting relatively free movement therebetween in the rolling direction of said rollable means, and spring means acting on said shoe means for urging said shoe means into said contact with said rollable means and friction surface.

19. In a railway truck of the type having a pair of members movable relative to each other in a plurality of directions, the combination of rollable means carried by one of said members and rollable in one direction only relative thereto, a friction surface movable with said other member, and spring pressed wedge means in frictional contact with said friction surface and in frictional and rolling contact with said rollable means for snubbing relative movement of said members in one direction while permitting relatively free movement therebetween in the rolling direction of said rollable means.

20. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a column on said side frame having a roller seat disposed transversely of said frame at an angle to vertical and horizontal planes, rollers mounted on said roller seat, and a spring-pressed shoe interposed between and acting against said rollers and bolster, said shoe being rollable transversely and slidable in the plane of said side frame on said rollers for snubbing a vertical movement of said bolster while allowing a relatively free lateral motion thereof.

21. In a railway truck of the type having a side frame with a lateral motion bolster disposed within a window opening thereof, the combination of, a pocket in a column of said side frame opening upwardly and inwardly toward said bolster, an inclined way in said pocket, rollable means in said pocket and rollable laterally only of said side frame on said way, and a spring-pressed wedge spaced from said side frame by said rollable means and interposed between and acting against said rollable means and bolster; said wedge being arranged to move horizontally with said bolster on said rollable means during a lateral motion thereof; said bolster being arranged to move relative to said wedge during a vertical motion thereof.

22. In a railway truck of the type having a side frame member and a lateral motion bolster member, the combination of wedge means frictionally engaging one of said members for snubbing a vertical movement of said bolster member, and roller means interposed between said other member and said wedge means and rollable transversely of said side frame member for allowing said bolster member to move relatively freely transversely of said side frame member.

23. In a railway truck of the type having a side frame member and a lateral motion bolster member disposed in a window opening thereof, the combination of, spring-pressed wedge means frictionally engaging one of said members for snubbing a vertical movement of said bolster member, and roller means interposed between said other member and said wedge means and rollable transversely of said side frame member for allowing said bolster member to move relatively freely transversely of said side frame member.

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