April 28, 1959 G. F. COUCH 2,883,944

SNUBBED RAILWAY TRUCKS

Filed Nov. 30, 1955 2 Sheets-Sheet 1

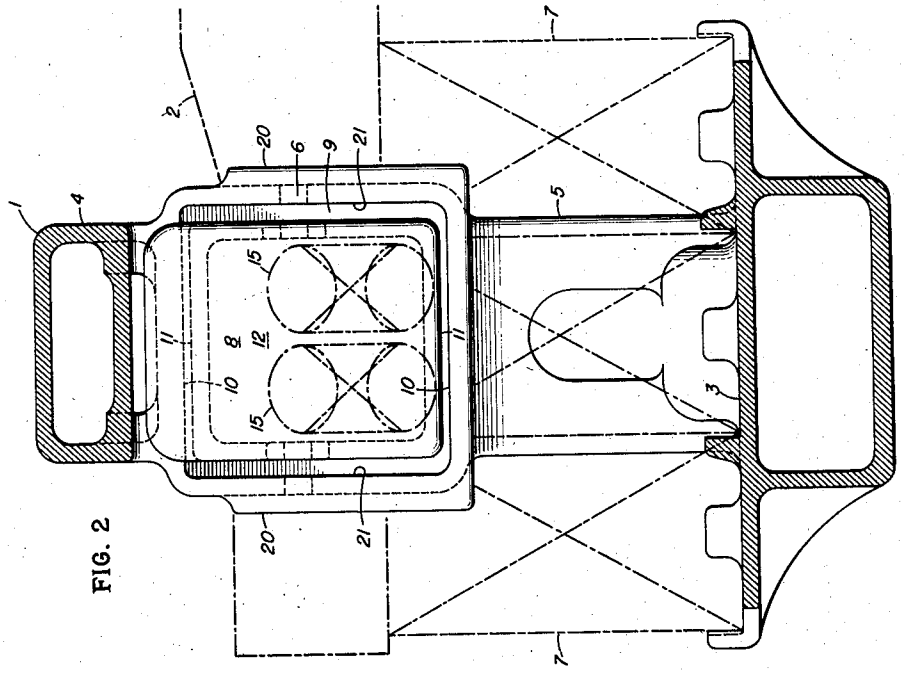


FIG. 2

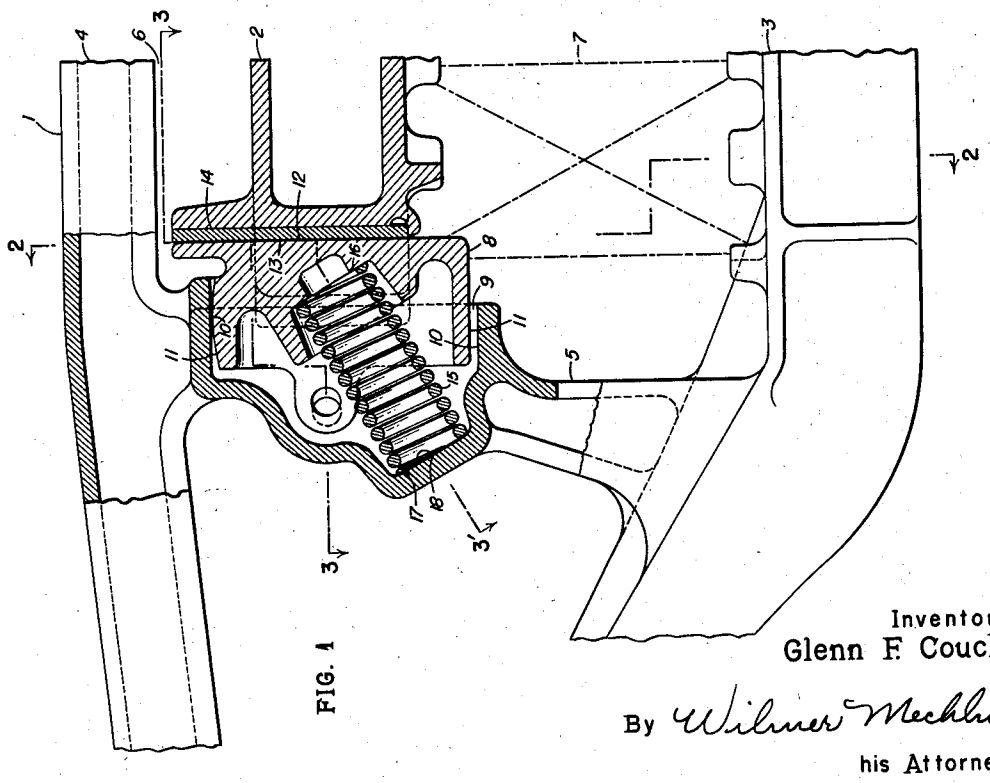


FIG. 1

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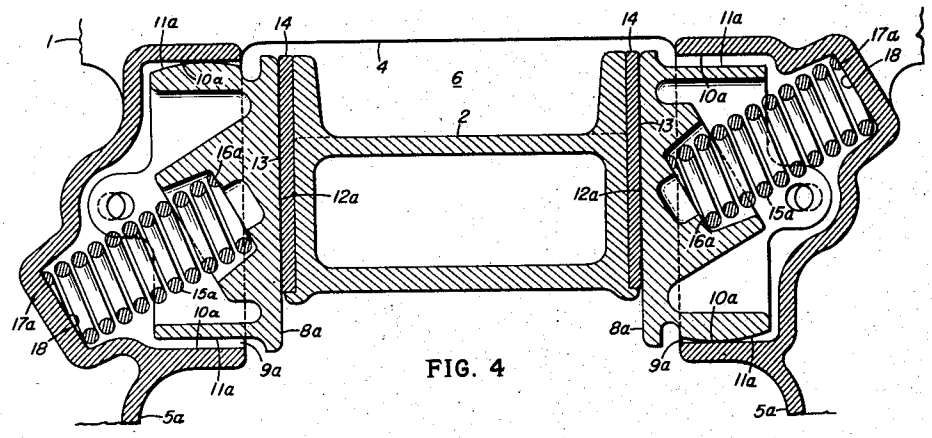


FIG. 4

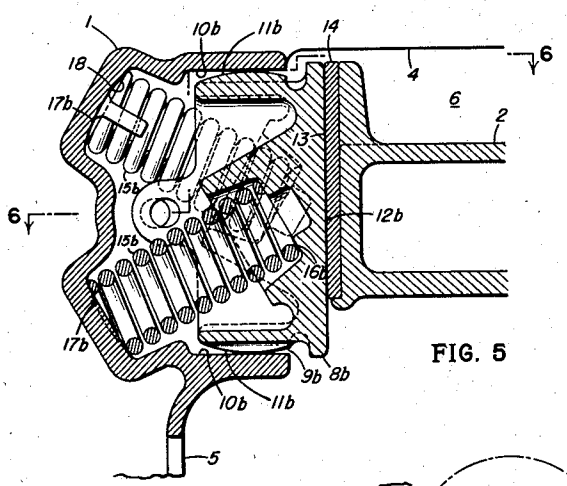


FIG. 5

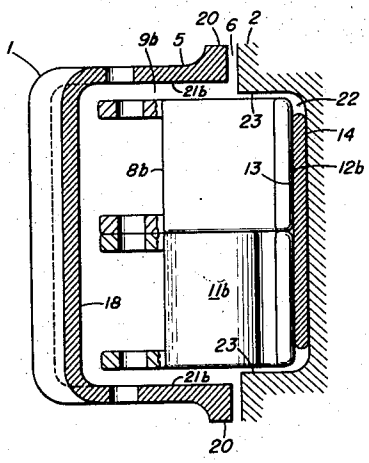


FIG. 6

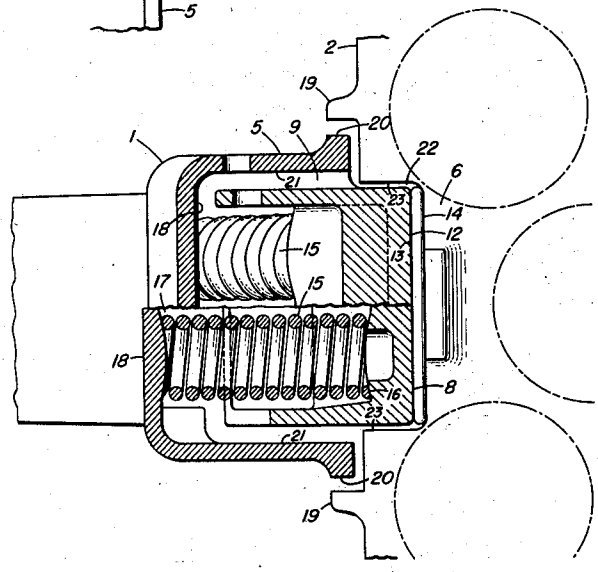


FIG. 3

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SNUBBED RAILWAY TRUCKS

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Application November 30, 1955, Serial No. 550,012

10 Claims. (Cl. 105—197)

This invention relates to snubbed railway trucks and particularly to a snubbed lateral motion truck in which a bolster or other spring-supported member is movable both vertically and laterally relative to a supporting member.

The friction wedges or like snubbing means of a conventional snubbed truck are designed primarily to dampen the periodic oscillations of the supporting springs by frictionally resisting the relative vertical movement of the bolster or other spring-supported member and if applied to a lateral motion truck, would resist both vertical and lateral movement with substantially the same force. Since this would practically inhibit desired lateral motion, it has been the practice in snubbed lateral motion trucks to restrict the snubbing to relative vertical movement. However, this is not an ideal solution, since, although not normally cushioned by coil springs, the lateral motion also tends to become periodic with consequent detriment to the action of the truck.

It is therefore the primary object of the present invention to provide a snubbed lateral motion truck in which both the vertical and the lateral relative movements of the bolster or other spring-supported member are snubbed but with different force.

Another object of the present invention is to provide a snubbed unit having a friction shoe actuated by an inclined spring which resists the relative movement of a pair of members, whereby each of the components of force of the spring acts to resist relative movement of the members in a different direction.

An additional object of the invention is to provide a snubbed unit of the character described whereby a predetermined difference is maintained between the force resisting relative vertical movement and that resisting horizontal movement.

A further object of the invention is to provide a snubbed railway truck wherein an inclined spring urges a friction shoe against a pair of surfaces substantially normally disposed relative to each other, one carried by each of a pair of relatively movable members and the friction between the shoe and one of the surfaces is limited or eliminated on relative movement of the members in directions substantially normal to that surface, whereby the resistance to relative movement of the members in different directions can be varied and the variation will be greater or less depending on the inclination of the spring.

A further object of the invention is to provide a snubbed truck wherein a pair of members are movable laterally and vertically relative to each other and both movements are snubbed by a plurality of inclined, spring-actuated shoes, the several components being of such construction and arrangement as to apply a resistance which, while uniform for each type of movement differs between the two types.

Other objects and advantages of the invention will appear hereinafter in the detailed description, be particularly

pointed out in the appended claims, and be illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary side elevational view of a railway truck incorporating an embodiment of the snubbing means of the present invention, with portions broken away and shown in section to more clearly illustrate certain of the details of construction;

Figure 2 is a vertical sectional view taken along the lines 2—2 of Figure 1;

Figure 3 is a horizontal sectional view, the upper portion taken along the lines 3—3 of Figure 1 and the lower portion taken along the lines 3'—3 of the same figure;

Figure 4 is a fragmentary vertical sectional view of a further embodiment of the snubbing means of the present invention;

Figure 5 is a fragmentary vertical sectional view of a third embodiment of the snubbing means of the present invention; and

Figure 6 is a horizontal sectional view taken along the lines 6—6 of Figure 5.

Referring now in detail to the drawings, in which like reference characters designate like parts, the snubbed unit of the present invention is designed for snubbing the relative movement of a pair of members in each of a plurality of directions and imposing a resistance to such movement which differs among the several directions. It is applicable to a pair of members, one of which is spring-supported on the other, where without snubbing the movement or oscillation would tend to become periodic and is especially adapted for application to a lateral motion railway truck in which a pair of spring-supporting and supported members are movable both laterally and vertically relative to each other. While in such application the pair of members may be a journal box and side frame or the base and cap of a spring package group, they will usually be a side frame and bolster and the application of the invention to the latter members has therefore been selected for purposes of illustration.

Since the construction, apart from the snubbing mechanism, is unimportant, only so much of the side frame 1 and bolster 2 have been shown as are required for an understanding of the invention. The illustrated side frame 1 is comprised of the usual tension member 3 and compression member 4 joined adjacent their outer extremities in the usual manner and connected intermediate their extremities by a pair of guide columns or uprights 5 spaced longitudinally of both side frame and truck and, with the included portions of the tension and compression members, defining a bolster opening 6 for receiving an end portion of the bolster 2 and a supporting spring group indicated diagrammatically at 7 which is interposed between the tension member 3 of the side frame and the bolster.

In accordance with the present invention, it is contemplated to pocket and have carried by one of the spring-supported and supporting members, one or more friction shoes 8 and resiliently urge the shoe into frictional engagement with surfaces on or carried by both of the members. While thus pocketable in either side frame or the bolster member in each of the illustrated embodiments, the shoes in all are shown pocketed in the guide columns 5 of the side frame, there being provided in one and preferably each guide column a pocket 9 opening longitudinally of the side frame onto or toward both bolster 2 and bolster opening 6. In each pocket of all of the embodiments is contained or housed at least one of the friction shoes 8 and the pocket has at or adjacent one or each of its vertical extremities a preferably rigid substantially horizontally directed shelf 10 which a substantially horizontally directed friction face 11 on the

corresponding end of the friction shoe is adapted to frictionally engage. Each shoe also has a second friction face **12** disposed substantially vertically or normal to the first friction face **11** and adapted to frictionally engage a correspondingly directed confronting friction surface **13** either on the bolster or on a wear plate **14** fixed thereto.

Also contained in each pocket and acting to urge an associated shoe into engagement with the shelf **10** and friction surface **13** is at least one coil spring **15** which is inclined with respect to both friction faces **11** and **12**, as well as the related shelf **10** and the friction surface **13**. Each spring seats at one end in a spring seat **16** in the shoe and its opposite end in a spring cavity or second spring seat **17** formed in the inner wall **18** of the pocket, the two cooperating spring seats being disposed substantially normal to the axis of the spring and thus also inclined relative to the friction faces, shelf and friction surface. With its total resilience or force divided between vertical or horizontal components, the division depending upon its inclination, each coil spring **15** is enabled to urge the faces **11** and **12** of the associated shoe **8** against the related shelf **10** and the friction surface **13**, despite the normal disposition of the shelf and surface relative to each other and with a force predetermined by the inclination of the spring. To accommodate any vertical angling of the bolster **2** relative to the side frame **1** as may occur under service conditions, the horizontally directed face **11** of the shoe **8** desirably is a crowned or rocker surface through which the shoe can rock on the shelf in maintaining its other or vertically directed face **12** in contact with the friction surface **13** on the bolster.

The provision of rocking engagement between a shoe and a shelf of a pocket and the inclination of the actuating coil spring are not in themselves new. However, the utilization of these and the other components of the snubbing mechanism to enable the vertical and horizontal or lateral movements of a bolster relative to a side frame to be snubbed with different force has not heretofore been conceived of. This major objective of the present invention is here attained by permitting the shoe limited movement in one direction in unison with the bolster while resisting this movement by the friction engendered between the horizontally directed face **11** of the shoe and the related shelf **10**.

As exemplified in Figure 3, the bolster **2** of each embodiment is movable laterally or transversely of the side frame **1** to the extent of the spacing between guide or limiting lugs or ears **19** on the bolster and inboard and outboard edges **20** of the guide column **5** which the guide lugs overlap. As also appears from the same figure, in each embodiment substantially equal or corresponding spacing, transversely of the side frame, is provided between the shoe or shoes carried by the side frame in each pocket and the inboard and outboard walls **21** of the latter. With this construction, each shoe is enabled to move laterally or transversely with the bolster and relative to the side frame without relative movement between the vertical friction surface **13** and the corresponding face **12** of the shoe. Since during such movement the inclined spring **15** maintains the shoe in contact with both the bolster and the shelf of the pocket, the transverse movement of the shoe relative to the pocket causes the horizontal frictional surface **11** on the shoe to rub against the shelf **10** and thus frictionally resist the lateral movement. To ensure that the friction surface **13** and corresponding face **11** of the shoe will move in unison during lateral movement of the bolster relative to the side frame, it is preferred to inset the friction surface in the side of the bolster within a vertical slot or recess **22**, the lateral walls **23** of the recess clearing the corresponding edges of the shoes so as not to interfere with vertical movement of the bolster but being sufficiently close to inhibit relative lateral movement of the shoe and bolster.

The relationship of the resistances imposed by the spring **15** on the relative vertical and lateral movements of the bolster and side frame is a function of its inclination. Were the spring inclined at an angle of 45°, its horizontal and vertical components of force would be equal and the resulting resistance to relative vertical and lateral movement would be about the same. However, by inclining each spring at an angle of less than 45°, its horizontal component of force is made the greater and the desired relatively less resistance to lateral motion is obtained. Such inclination has the further advantage of increasing the direct resistance of the springs to horizontal angling of the bolster relative to the side frame and consequent unsquaring of the truck, while also affording frictional resistance to such unsquaring through engagement of the shoes with the shelves.

The several embodiments shown in the accompanying drawings all incorporate the above characteristics and differ from each other primarily in the arrangement of the springs and number of shoes in each pocket. In the embodiment of Figs. 1–3 the shelves in the two pockets are substantially coplanar, each of the pockets **9**, one in the guide column **5** at either side of the bolster **2**, containing a single shoe **8** and each of the opposed shoes is acted upon by a pair of springs which are inclined upwardly towards the bolster and oppositely relative to those in the other pocket. This embodiment is illustrative of conventional snubbing of vertical movement the resistance afforded to vertical movement of the bolster being greater in one direction, here upward, than in the opposite direction.

The embodiments of Figure 4 and Figures 5 and 6 are designed to provide substantially equal resistance to both upward and downward movement of the bolster. In the embodiment of Figure 4, this is accomplished with a single shoe **8*a*** in each pocket **9*a***. However, by contrast with the first embodiment, the pair of springs **15*a*** acting on one of the shoes is inclined upwardly toward the bolster while that acting on the other shoe is parallel to the first and inclined downwardly and the shelves **10*a*** in the pockets and horizontally directed faces **11*a*** on the shoes are correspondingly reversed, those at the left being at the upper ends of these elements while those at the right are at their lower ends and thus vertically spaced from those at the right. As a consequence, while the resistance of the shoe at the left is less to downward than to upward movement, that at the right is the reverse and the two forces balance each other so that the bolster is equally resisted in both upward and downward vertical movement relative to the side frame.

In the third embodiment of Figures 5 and 6, each pocket contains a pair of shoes **8*b***, each acted upon by a single spring **15*b***, one inclined downwardly and the other upwardly toward the bolster and the pocket has horizontally directed shelves **10*b*** at both its upper and its lower limits, each engaged by the correspondingly positioned, horizontally directed friction face **11*b*** on one of the shoes. The pair of springs in each pocket being inclined equally above and below the horizontal, the resultant resistance to upward and downward movement is equalized at either side of the bolster.

From the above detailed description, it will be apparent that there has been provided an improved snubbed unit particularly adapted to a railway truck and capable of resisting the movement of a pair of members in a plurality of directions with different force. It should be understood that the described and disclosed embodiments are merely exemplary of the invention and that all modifications are intended to be included which do not depart either from the spirit of the invention or the scope of the appended claims.

Having described my invention, I claim:

1. In a snubbed unit, the combination with a pair of

members movable relative to each other in a plurality of directions and a spring group interposed between said members, of a friction surface carried by one of said members and disposed substantially in one of said directions, a shelf carried by the other of said members and disposed substantially normal to said surface and in another of said directions, a friction shoe having a pair of friction faces each disposed substantially in the direction of and frictionally engageable with one of said shelf and surface, coil spring means inclined relative to both of said faces and acting between said shoe and one of said members for urging said faces into said engagement with said surface and shelf, and limiting means normally spaced from said shoe for enabling said shoe to move in unison with said other member on movement thereof in any direction parallel to said shelf relative to said one member, said shoe by engagement with said surface resisting relative movement of said members in a direction normal to said shelf and by engagement with said shelf resisting said relative movement in any direction parallel to said shelf.

2. In a snubbed unit, the combination with a pair of relatively movable members and spring means interposed between said members, of a friction surface carried by one of said members, a friction shelf carried by said other member and disposed substantially normal to said friction surface, a friction shoe having a pair of friction faces each disposed substantially parallel to and engageable with one of said surface and shelf, coil spring means acting between said other member and shoe and inclined relative to both of said faces for urging said faces into engagement with said surface and shelf, and limiting means normally spaced from said shoe for enabling said shoe to move in unison with said other member on movement thereof in any direction parallel to said shelf relative to said one member, said shoe by engagement with said surface resisting relative movement of said members in a direction normal to said shelf and by engagement with said shelf and independently of said engagement with said surface resisting said relative movement in any direction parallel to said shelf.

3. In a railway truck, the combination with a pair of members movable vertically and laterally relative to each other and supporting springs interposed between said members, of a substantially vertically directed friction surface on one of said members, a pocket in said other member and opening toward said one member, a substantially horizontally directed shelf in said pocket, friction shoe means in and spaced laterally from inboard and outboard walls of said pocket, said shoe means having a substantially vertically directed face engageable with said surface and a substantially horizontally directed face engageable with said shelf, coil spring means inclined relative to said faces and acting between a wall of said pocket and said shoe means for urging said faces into said engagement with said surface and shelf, and stop means carried by said one member and embracing inboard and outboard edges of said other member, said stop means being laterally spaced from said edges in substantial correspondence with the spacing of said shoe means from said walls of said pocket for limited lateral movement in unison of said shoe means and one member against the friction engendered between said shelf and the shelf-engaging face of said shoe.

4. In a railway truck, the combination with a pair of members movable vertically and laterally relative to each other and supporting springs interposed between said members, of a substantially vertically directed friction surface on one of said members, a pocket in said other member, a pair of vertically spaced substantially horizontally directed shelves in said pocket, a pair of shoes in said pocket both having friction faces engageable with said friction surface and each having a friction face engageable with one of said shelves, and coil spring means oppositely inclined relative to each other and to said faces and each acting between an inner wall of said pocket and one of said shoes for urging said faces into said frictional engagement with said friction surface and the adjacent of said shelves, said shoes being laterally spaced from confining inboard and outboard walls of said pocket in correspondence with the spacing of stop means on said one member from inboard and outboard edges embraced thereby of said other member for limited lateral movement in unison of said shoes and one member relative to said other member against the resistance engendered between said shelves and shelf-engaging faces of said shoes.

5. In a snubbed unit, the combination with a pair of members movable vertically and laterally relative to each other and spring means interposed between said members, of a substantially vertically directed friction surface carried by one of said members, a substantially horizontally directed shelf carried by said other member, a friction shoe having a substantially vertically directed face engageable with said surface and a substantially horizontally directed crowned face engageable with said shelf, coil spring means acting between said shoe means and other member and inclined relative to both said faces for urging said faces into said engagement with said surface and shelf, stop means carried by said one member and embracing and spaced from inboard and outboard edges of said other member for limiting said lateral movement, and limiting means normally spaced laterally from said shoe in correspondence with the spacing between said stop means and edges for enabling said shoe to move laterally relative to said other member in unison with said one member against the resistance engendered between said shelf and the shelf-engaging face of said shoe.

6. In a railway truck, the combination with a pair of members movable relatively in vertical and horizontal directions and supporting coil springs interposed between said members, of a substantially horizontally directed shelf on one of said members, a substantially vertically directed surface on the other of said members, a shoe carried by one of said members and having a substantially horizontally directed face engageable with said shelf and a substantially vertically directed face engageable with said surface, coil spring means inclined relative to said face and acting between said one member and shoe for urging said faces into frictional engagement with said shelf and surface, and limiting means normally spaced from said shoe for enabling said shoe to move in unison with said other member on movement thereof in a horizontal direction relative to said one member, said shoe by engagement with said vertical surface frictionally resisting relative vertical movement of said members and by engagement with said shelf imposing a different frictional resistance to relative horizontal movement of said members.

7. In a snubbed unit, the combination with a pair of members movable relative to each other in a plurality of directions and a spring group interposed between and urging said members in one of said directions, of a friction surface carried by one of said members and disposed substantially in said one direction, a friction shelf carried by said other member and disposed substantially normal to said surface and in another of said directions, a friction shoe having a pair of friction faces each disposed substantially in the direction of and frictionally engageable with one of said shelf and surface, coil spring means inclined relative to both of said faces and acting between said shoe and one of said members for urging said faces into said frictional engagement, and limiting means normally spaced from said shoe for enabling said shoe to move in unison with one of said members on movement thereof in one of said directions relative to the other member, whereby resistance to relative movement of said members in each of said directions is engendered by a different component of force of said spring means.

8. In a snubbed railway truck, the combination with a pair of relatively movable members and spring means interposed between said members, of a friction surface carried by one of said members, a pocket in said other member, shelf means in said pocket and disposed substantially normal to said surface, shoe means in said pocket and having a plurality of friction faces each disposed substantially parallel to and engageable with one of said surface and shelf means, coil spring means acting between said other member and shoe means for urging said faces into said engagement with said surface and shelf means, and limiting means normally spaced from said shoe means for enabling said shoe means to move in unison with said one member on movement thereof in a direction substantially parallel to said shelf means relative to said other member against the force exerted by said spring means between said shoe means and shelf means, said shoe means by engagement with said surface resisting relative movement of said members in a direction substantially normal to said shelf means.

9. In a railway truck, the combination with a pair of members movable vertically and laterally relative to each other and supporting springs interposed between said members, of a pair of transversely spaced substantially vertically directed friction surfaces on one of said members, transversely spaced pockets in the other of said members and each opening toward one of said friction surfaces, a pair of substantially coplanar horizontally directed shelves one in each of said pockets, friction shoe means in each of said pockets and each having a pair of friction faces one disposed substantially parallel to and engaging each of the adjacent of said surfaces and shelves, coil spring means in each of said pockets and acting between the related shoe means and said other member, said coil spring means in said pockets being oppositely inclined relative to each other and said faces

for urging said faces into engagement with adjacent of said surfaces and shelves, and limiting means normally spaced laterally from each of said shoe means for enabling said shoe means to move in unison with said one member on movement thereof laterally relative to said other member against friction engendered between said shelves and the shelf-engaging faces of said shoes.

10. In a railway truck, the combination with a pair of members movable vertically and laterally relative to each other and supporting springs interposed between said members, of a pair of transversely spaced substantially vertically directed friction surfaces on one of said members, transversely spaced pockets in the other of said members and each opening toward one of said friction surfaces, a pair of vertically spaced substantially horizontally directed shelves one in each of said pockets, friction shoe means in each of said pockets and each having a pair of friction faces one disposed substantially parallel to and engaging each of the adjacent of said surfaces and shelves, coil spring means in each of said pockets and acting between the related shoe means and said other member, said coil spring means in said pockets being inclined relative to said faces and substantially parallel to each other for urging said shoe means on opposite sides of said one member against said friction surfaces and oppositely against said shelves, and limiting means normally spaced from each of said shoe means for enabling said shoe means to move in unison with said one member on movement thereof laterally relative to said other member against friction engendered between said shelves and the shelf-engaging faces of said shoes.

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