Jan. 3, 1956 G. F. COUCH 2,729,174

SNUBBED RAILWAY TRUCK

Filed June 7, 1950 2 Sheets-Sheet 1

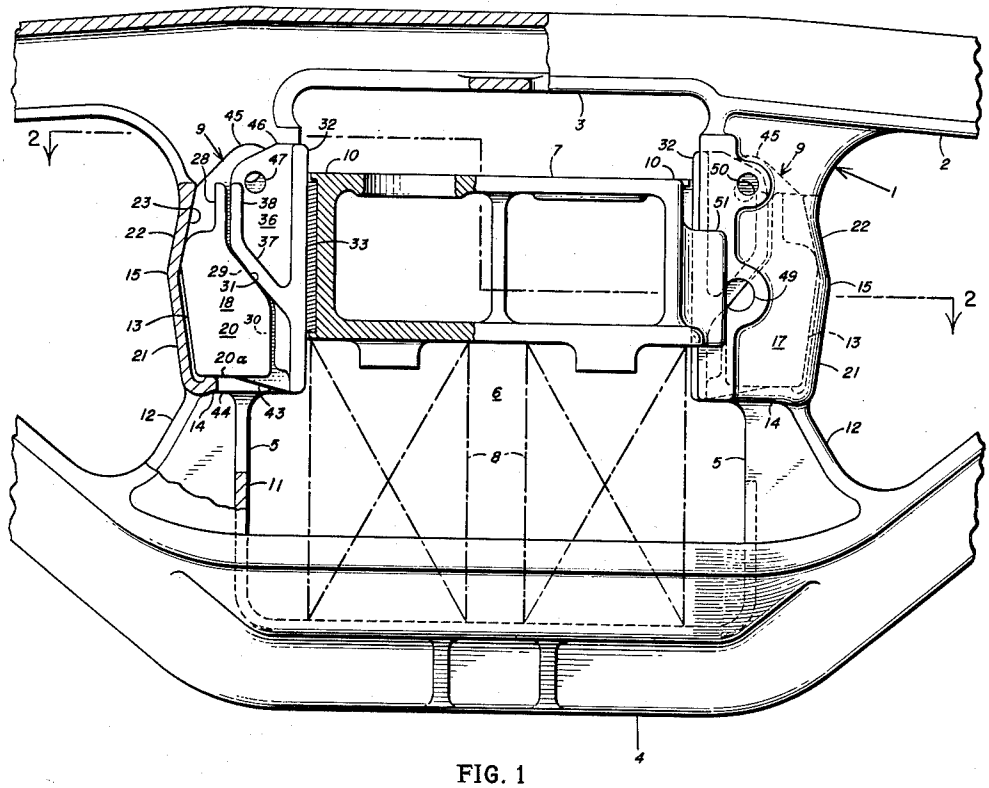


FIG. 1

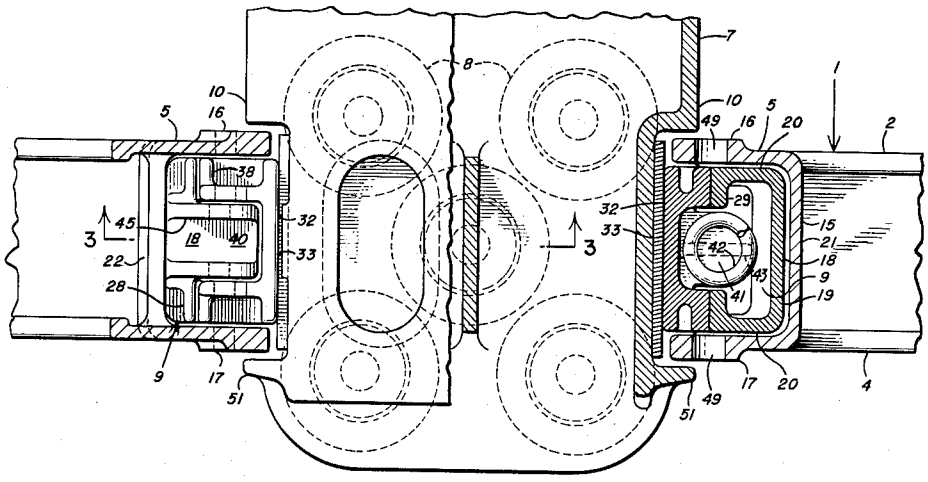


FIG. 2

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SNUBBED RAILWAY TRUCK

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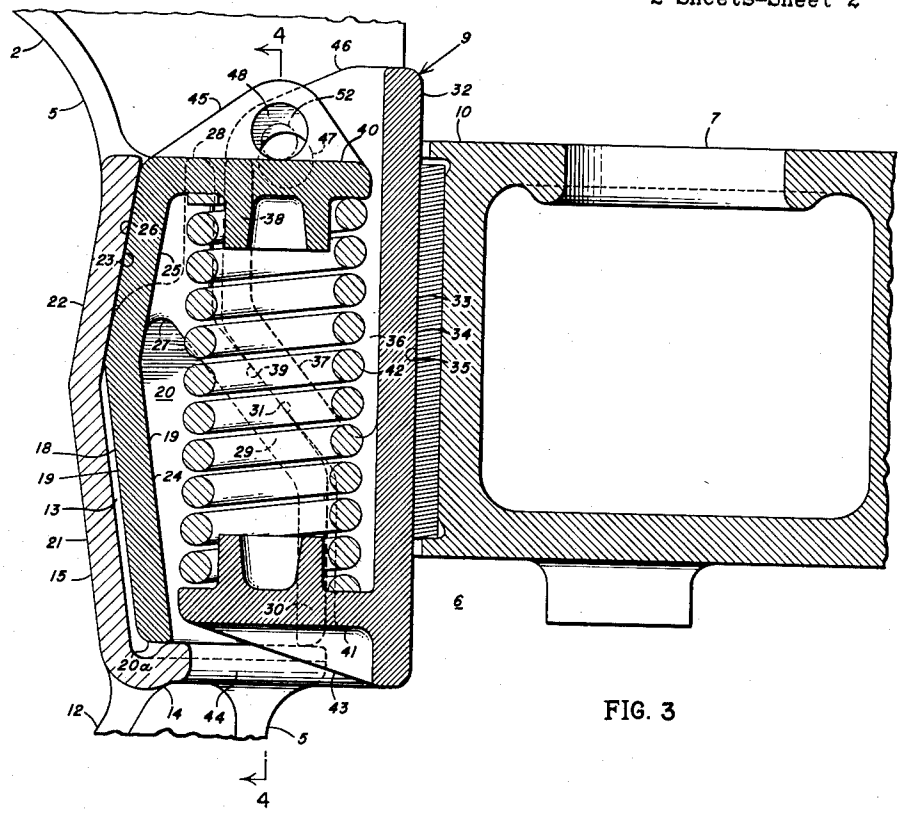


FIG. 3

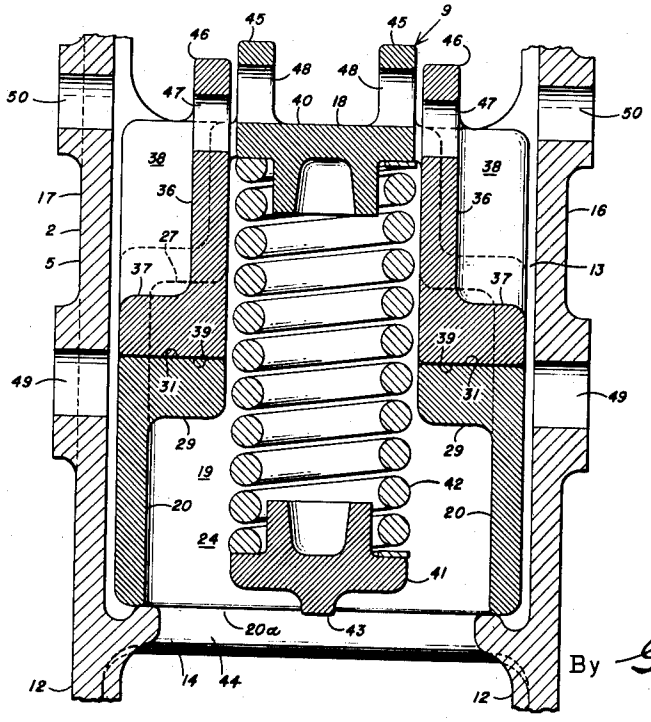


FIG. 4

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United States Patent Office 2,729,174 Patented Jan. 3, 1956

2,729,174

SNUBBED RAILWAY TRUCK

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Application June 7, 1950, Serial No. 166,691

25 Claims. (Cl. 105—197)

This invention pertains to a railway truck and more particularly to a snubbed or friction controlled type thereof.

An object of the present invention is the provision, in a railway truck, of an improved friction unit adapted for insertion in or removal from a railway truck as a self-contained assemblage.

A further object of this invention is the provision, in a railway truck, of an improved friction unit for application between a side frame and bolster to frictionally engage the bolster throughout the entire range of vertical movement of the bolster relative to the side frame.

An added object of the invention is the provision, in a railway truck, of an improved friction unit adapted to be interlocked with a side frame and frictionally contact a bolster.

A still further object of the invention is the provision, in a railway truck, of an improved self-contained friction unit arranged to be removably associated with and carried by a column of a side frame and acting longitudinally of a side frame for controlling actions of bolster supporting springs.

The above and many other general as well as specific objects of the invention will become apparent from the succeeding detailed description thereof taken into consideration with an exemplified form of the invention as illustrated in the accompanying drawings wherein:

Figure 1 is a side elevational view of a railway truck partially shown in section and illustrative of the components forming an improved snubbing or friction controlled arrangement.

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 an enlarged vertical sectional view taken along the lines 3—3 of Figure 2 looking in the direction of the arrows.

Figure 4 is a transverse sectional view taken along the lines 4—4 of Figure 3 looking in the direction of the arrows.

Referring now to the various figures of the drawings in more detail and wherein like reference characters indicate like parts, the numeral **1** is employed to designate in a somewhat general manner, a railway truck characteristic of the present invention. Forming a part of the railway truck is a side frame **2** comprising a top or compression member **3** spaced vertically from a bottom or tension member **4** with these two members joined by vertically directed guide columns **5**. The guide columns, which may hereinafter be referred to as columns, are spaced a predetermined or required distance apart longitudinally of the side frame to define a window opening **6** therebetween. Positioned in and occupying an upper area of the window opening is a bolster or bolster extremity **7** and occupying a lower area of the window opening and resting on the tension member is a nest or group of springs **8** in supporting relation with the bolster. It is preferred to employ in the spring group, an assemblage

of all coil springs since this type of spring is extremely responsive and thus external impulses transmitted to the side frame in service will be cushioned considerably and thereofore, materially reduced in intensity as they are passed on to the bolster. This type of spring suspension has its disadvantages in that the external impulses will during a given truck speed, synchronize with the vibrations of the all-coil springs thereby resulting in the spring group being driven to solid height to cause regular periodic shocks being imparted to the bolster.

The invention herein contained has to do with controlling or snubbing the actions of the spring group by means of auxiliary units associated with the side frame and bolster and independent in operation, or structural association, of the spring group.

So as not to infringe on the area beneath the bolster, allotted to the bolster supporting spring group and thus permit an application of a full capacity spring group in this desired or restricted area, friction units **9** are interposed between the side frame columns and the bolster, preferably at each side **10** of the bolster. Since the components on each side of the transverse center line of the truck are identical in every respect the hereinafter contained description will, so far as possible for a clear understanding of the invention, be confined to one side of the bolster or one quarter of the truck; it being clearly understood that a railway truck comprises two longitudinally directed, transversely spaced, side frames joined by a laterally extending bolster.

The column is, for strength purposes, of general channel section and as such comprises throughout its lower portion a transverse web **11** merging with lower inner and outer flanges **12**. To carry out this same structural design the column at its upper portion is also of channel configuration in horizontal section, however, this portion of the column forms or presents a pocket or casing **13** at the side of the bolster and accommodates the friction unit **9**. Generally considered the pocket opens toward the bolster and also upwardly toward the side frame compression member not only for a proper functioning of the friction unit but also to facilitate application of the unit to and removal of the unit from, the pocket. The portion of the column which defines the pocket is primarily a bottom or lower shelf or ledge **14** which is preferably horizontally disposed and is spaced a predetermined distance from the bolster side so as not to cause any interference therebetween during service. In other words the shelf or ledge is disposed intermediate the height of the column to form an integral part thereof and be adequately supported by the lower portion of the column. Rising vertically from a rear or transverse edge of the shelf, removed from the bolster adjacent edge, is a back or bearing wall or web **15** and this web has its lateral edges merging with inboard and outboard flanges **16** and **17**, respectively. As will be apparent from a review of the drawings, these last named flanges are vertical or upward continuations of the lower inner and outer flanges of the column.

The column pocket forms a cage or housing confining the friction unit and this component comprises a wedge **18** which, as hereinafter brought out, is restrained against any unwarranted vertical or horizontal movement relative to the side frame or column. In other words, the wedge is removably fixed to the column throughout the entire range of service movements of the components forming the railway truck. The wedge comprises an end or back wall **19** having at lateral edges thereof, integrally formed, transversely spaced, side walls **20**. These wedge walls are all directed vertically and their lower extremities form a foot **20***a* which bears directly upon the column shelf **14** for the support therof and to maintain the wedge in a fixed elevated position. The shelf prevents a downward vertical movement of the wedge and, as hereinafter made appar-

ent, some means is required to prevent an upward vertical movement of this component. Many arrangements present themselves for an adequate and complete fulfillment of this function, however, the simplest, preferred or best mode is a utilization of the pocket bearing wall. As clearly illustrated in the drawing a bearing wall lower portion **21** leans or slopes at a slight degree off of a true vertical, in a direction away from the bolster or bolster opening and an upper portion **22** of the bearing wall leans or slopes also at a slight degree off of a true vertical but in a direction toward the bolster. This disposition of bearing wall portions creates a herring-bone effect or V-shape in vertical section and as such the upper portion may be considered to overlie slightly the shelf in spaced relation thereto and presents a bearing surface **23** exposed in a longitudinal direction toward the bolster. The back of the wedge is formed to approximate the configuration of the pocket bearing wall except that the lower portion **24** of the back wall is spaced a slight distance from the related portion of the pocket bearing wall since it is believed at the present writing unnecessary to have a full contact between and throughout the entire length of the bearing and back walls. The upper portion **25** of the wedge back wall has a backup surface **26** in full bearing relation with the bearing surface **23**. Since the surfaces **23** and **26** are in contact with one another over an appreciable area and are disposed at an incline or an acute angle when considered with the shelf or ledge, the overhanging effect of the surface **23** functions as a barrier or bulkhead to thereby prevent an upward vertical movement of the wedge relative to the column. The wedge backup wall at its upper extremity and adjacent each of the transverse limits thereof, is inturned or indented as at **27** where it continues upwardly or vertically to the extreme upper limit of the wedge as an upstanding flange **28**. The side walls **20** of the wedge merge with the upstanding flanges and, in effect, form downward continuations thereof and are inclined or disposed at a diagonal in a direction away from the wedge backup wall and toward the bolster to present sloping webs **29**. These transversely spaced diagonal or sloping webs are disposed at an acute angle to the ledge or shelf and also to the upper portion of the wedge back wall. Since these webs decline toward the bolster they, however, terminate short of the bolster and merge with downstanding flanges **30** which continue downwardly to the lower edge of the wedge. The webs also are provided with flat or plain faces **31** which also are of the same disposition as the web as above noted. These faces, which may be considered foundation, wedging or bearing faces as hereinafter brought out more fully, are exposed upwardly and outwardly of the pocket toward the bolster.

Interposed between the wedge and bolster is a shoe **32** having a vertically disposed front wall **33** presenting a brushing face **34** exposed to the bolster and arranged to be engaged or frictionally contacted by a rubbing face **35** carried by the bolster side. The brushing and rubbing faces are in constant contact with one another and the frictional forces created on these relatively movable faces function as a retarding or balancing medium to disturb the otherwise harmonic action of the bolster supporting springs. The shoe front wall has, extending horizontally or rearwardly therefrom, laterally spaced gusset walls **36** which have outwardly or laterally directed supporting flanges **37**. Each supporting flange at its lower portion grows out of the front wall intermediate the height thereof and is therefrom directed upwardly at an incline to form, with the front wall, an acute angle. The upward inclination of the supporting flanges continues until they approach or come adjacent to the wedge upstanding flange where they are turned upwardly or vertically as strengthening flanges **38** and terminate near the upper extremity of the shoe. Preferably the supporting flanges are provided with exposed crowned or convex faces **39** which bear directly upon the web faces **31** and because of this association or arrangement of faces, the shoe may readily and automatically adjust itself by rolling on the supporting web faces and thereby, at all times, insure a full surface bearing relationship between the friction rubbing and brushing faces. As will be clearly understood the plain and crowned faces are disposed at the angle above indicated so that the shoe will be directed at all times into frictional engagement with the bolster.

Some force imparting resilient element or means must be associated with the shoe to urge it along the wedge plain faces into contact with the bolster and here again many thoughts present themselves for the fulfillment of this function. The preferred arrangement comprises the formation of a horizontal flange or upper spring seat **40** joining together upper extremities, in an integral fashion, of the wedge back and side walls. Spaced beneath or downwardly or vertically from the upper spring seat is a horizontal flange or lower spring seat **41** formed integrally with lower extremities of the shoe front wall and gusset walls so that the wedge spring seat and shoe spring seat are in substantial vertical alignment within the area of the shoe and wedge; that is to say, the wedge spring seat is in telescoping relation with the shoe at one or an upper end of the unit while the shoe spring seat is in telescoping relation with the wedge at another or a lower end of the unit. Disposed entirely within the friction unit is a resilient means characterized by a single coil or helical spring **42** having an axis disposed in a truly vertical direction and bearing at its opposite ends against the aligned or related spring seats. Since the coil spring **42** is precompressed in assembly it therefore urges the wedge and shoe in opposite directions and because of the disposition of the plain and convex faces, the horizontal component will result in the shoe pressing horizontally against the bolster side.

The shoe bottom spring plate is suitably reinforced by a triangular brace **43** and because this structure extends into the horizontal area of the shelf, the latter is recessed or cut away at its center as at **44** to accommodate the brace.

Inserting the friction unit in the column and the removal therefrom may, without proper equipment or tools, present a serious problem because, if the expansive action of the unit is not arrested or limited when the bolster, for example, is removed from a side frame, the unit will explode or fly apart. To circumvent such an action of the friction unit, the wedge spring seat has upstanding therefrom, hanger ears **45** which among other functions form reinforcing means for the wedge spring seat. These hanger ears are spaced transversely of the unit and are in telescoping relation with the shoe. The shoe gusset walls are extended vertically or upwardly to form lugs **46** spaced outwardly of and in overlapping relation with the wedge ears so that portions of the lugs and ears are disposed at approximately the same elevation. The lugs are provided with transversely aligned apertures **47** while the ears are provided with transversely aligned openings **48** and as will be noted from a review of Figures 3 and 4, particularly, the apertures and openings are, relative to one another, normally and slightly out of transverse alignment. The outboard flange only of the column cage or housing has a lower eyelet **49** and immediately thereabove an upper eyelet **50**. When, therefore, after assembly and service, it is desirous of removing, for any reason, the side frame from the bolster, a pinch or other suitable bar (not shown) is inserted in the lower eyelet and since a bolster lug **51** encroaches on the clear opening into this eyelet the bolster can then be pried horizontally toward the transverse center line of the truck. This prying action will result in the shoe in the opposite column being urged in a corresponding direction and, because of the disposition of the plain and crowned faces, the shoe will be raised slightly to cause a full alignment of the lug apertures and ear openings. With these members in this abnormal relation a locking pin **52** (shown in phantom in Figure 3) is then threaded through

the corresponding upper eyelet so as to bridge the ears and lugs and thus lock the shoe and wedge with their contained spring together and facilitate the removal thereof from the column pocket as a unit. By following a like method, the unit in the other column may be also locked against expansion and upon removal of the bolster supporting springs and a subsequent lowering of the bolster into the area which was occupied by the bolster supporting springs, the units in the columns may be then safely and easily removed and, as noted, without employing any special tools.

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

I claim:

1. In a railway truck of a type having a side frame member and a vertically movable member, the combination of, one of said members having a pocket with a horizontal shelf and a wall forming an acute angle with said shelf, a wedge resting on said shelf and having a surface in bearing relation with said wall, an inclined face on said wedge, a shoe in frictional engagement with said other member and movably contacting said inclined face, and spring means for urging said shoe along said inclined face into frictional engagement with said other member.

2. In a railway truck of a type having a side frame member and a vertically movable member, the combination of, one of said members having a pocket opening toward said other member, said pocket having a horizontally directed shelf and a surface forming an acute angle with said shelf, a wedge stationary relative to said pocketed member and bearing against said shelf and surface, an inclined face on said wedge, a shoe in frictional contact with said other member and supported by said inclined face, and spring means interposed between said shoe and wedge for urging said shoe along said inclined face into frictional contact with said other member.

3. In a railway truck of a type having a side frame member and a vertically movable member, the combination of, one of said members having a pocket opening vertically and horizontally, said pocket having a horizontally directed shelf and a surface directed at an acute angle to said shelf, a wedge within said pocket and engaging said shelf and surface for preventing vertical movement of said wedge relative to said pocketed member, an inclined face on said wedge exposed toward said other member, a shoe in frictional contact with said other member and carried by said inclined face, and spring means acting in opposite directions against said shoe and wedge for urging said shoe against said wedge and into frictional contact with said other member.

4. In a railway truck of a type having a side frame member and a vertically movable member, the combination of, one of said members having a pocket opening horizontally toward said other member, said pocket having a horizontally directed shelf and a surface inclined with respect thereto to present an acute angle therebetween, a wedge within said pocket and locked therein by said shelf and surface, a face on said wedge forming an acute angle with said shelf, a shoe in frictional engagement with said other member and rockably carried by said wedge face, and spring means between said wedge and shoe urging said shoe along said face and into engagement with said other member.

5. In a railway truck of a type having a side frame member and a vertically movable member, the combination of, one of said members having a pocket, said pocket having therein a horizontally directed shelf and a surface directed at an acute angle to said shelf, a wedge having walls corresponding to and bearing against said shelf and surface for maintaining said wedge removably fixed within said pocket, an inclined face on said wedge forming an acute angle with said surface, a shoe carried by said inclined face, and spring means acting against said wedge and shoe for urging said shoe along said face and into frictional engagement with said other member.

6. In a railway truck of a type having a side frame member and a vertically movable member, the combination of, one of said members having an open pocket intermediate upper and lower limits thereof, said pocket having therein a horizontally directed shelf and a vertically directed surface forming an acute angle with said shelf, a wedge, said wedge having walls corresponding to and bearing against said shelf and surface for maintaining said wedge removably secured within said pocket, a face on said wedge directed at an acute angle to said surface and shelf, a shoe carried by said face, and resilient means within said shoe and wedge for urging said shoe along said face and into frictional contact with said other member.

7. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a pocket in a column of said side frame opening toward said bolster, said pocket having a horizontally directed shelf and a surface forming an acute angle with said shelf, a wedge supported by said shelf and bearing against said surface for maintaining said wedge removably fixed to said side frame, a face on said wedge sloping toward said bolster, a shoe supported solely by said wedge, and spring means urging said shoe along said face and into frictional engagement with said bolster.

8. In a railway truck having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a pocket in a column of said side frame opening toward said bolster, said pocket having therein a shelf and a surface disposed at an acute angle to one another, a wedge carried by said shelf and bearing against said surface for preventing relative vertical movement of said wedge and side frame, an inclined face on said wedge exposed toward said bolster, a shoe having an inclined face bearing against said wedge inclined face, a vertically directed surface on said shoe in frictional engagement with said bolster, and spring means urging said faces together.

9. In a railway truck of a type having a side frame and a bloster arranged for vertical movement relative to said side frame, the combination of, a pocket in a column of said side frame opening upwardly and toward said bolster, a horizontal shelf and sloping surface in said pocket, a wedge within said pocket and bearing against said shelf and surface, said surface preventing movement of said wedge in one direction, a face on said wedge inclined away from said bolster, a shoe carried by said face and directed thereby into frictional engagement with said bolster, and spring means acting against opposed portions of said wedge and shoe for urging said shoe along said face.

10. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a pocket in a column of said side frame, said pocket having therein a horizontal shelf and a sloping surface partially covering said shelf, a wedge interposed between said shelf and surface and retained thereby removably fixed relative to said column, a diagonal face on said wedge spaced vertically from said shelf and exposed toward said bolster, a shoe carried by said face and directed thereby into frictional engagement with said bolster, and spring means acting in opposite directions against said wedge and shoe and urging said shoe against said face.

11. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a horizontal shelf and a surface disposed at an acute angle thereto carried by a column of said side frame, a wedge bearing against said shelf and surface for preventing vertical movement

of said wedge relative to said column in either direction, a diagonal face on said wedge spaced from said shelf and surface and exposed toward said bolster, a shoe having a diagonal face in bearing relation with said wedge diagonal face, and spring means acting against said wedge and shoe for urging said shoe along said wedge face into frictional contact with said bolster.

12. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a horizontal shelf and a surface disposed at an acute angle thereto carried by a column of said side frame, a wedge within said column and in bearing relation with said shelf and surface so as to retain said wedge removably fixed to said column, a face on said wedge disposed at an acute angle to said surface and shelf and exposed in a direction toward said bolster, a shoe having a face in contact with said wedge face for supporting said shoe in an elevated position, a brushing surface on said shoe in frictional engagement with said bolster, and spring means within said shoe and wedge for urging said shoe along said wedge face and into contact with said bolster.

13. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a horizontally directed shelf and a wall forming an acute angle with said shelf in a column of said side frame, a wedge in said column and retained against vertical movement relative to said column by said shelf and wall, a shoe directed toward said bolster and supported by said wedge, and spring means within and acting against said shoe and wedge for urging said shoe into frictional engagement with said bolster.

14. In a railway truck of a type having a side frame and bolster arranged for vertical movement relative to said side frame, the combination of, a column of said side frame having therein a horizontally directed shelf and an angularly related wall, a wedge in said column and restrained against vertical movement relative to said column by said shelf and wall, a shoe supported solely and directed toward said bolster by said wedge, and spring means within and acting solely against said wedge and shoe for urging said shoe into frictional engagement with said bolster.

15. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a column of said side frame having therein a horizontally directed shelf and an angularly related wall, a wedge in said column restrained against vertical movement relative to said column by said shelf and wall, a shoe supported and directed toward said bolster by said wedge, spring means within said wedge and shoe for urging said shoe into frictional engagement with said bolster, and means on said wedge and shoe for locking them together to facilitate removal of said wedge, shoe and spring means as a unit from said column.

16. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a column of said side frame having therein a horizontally directed shelf and an angularly related wall, a wedge in said column restrained against vertical movement relative to said column by said shelf and wall, diagonally disposed faces on said wedge and exposed toward said bolster, a shoe having faces in engagement with said diagonal faces, a vertically directed brushing surface on said shoe in frictional contact with said bolster, and spring means within said wedge and between said diagonal faces for wedging said shoe along said diagonal faces into frictional contact with said bolster.

17. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a column of said side frame carrying a horizontally directed shelf and an angularly related wall, a wedge supported against vertical movement in one direction by said shelf and restrained against vertical movement in an opposite direction by said wall, spaced diagonal faces on said wedge declining toward said bolster, a shoe carried by said faces and having a brushing face vertically disposed and frictionally engaging said bolster, and spring means within said shoe and wedge between said diagonal faces for urging said shoe along said diagonal faces and into engagement with said bolster.

18. In a railway truck of a type having a side frame and a bolster arranged for vertical movement relative to said side frame, the combination of, a column of said side frame carrying a horizontal directed shelf and an angularly related wall, a wedge supported against vertical movement in one direction by said shelf and supported against vertical movement in an opposite direction by said wall, spaced diagonal faces on said wedge declining toward said bolster, a shoe carried by said faces and having a brushing face vertically disposed and frictionally engaging said bolster, spring means between said diagonal faces for urging said shoe therealong into frictional engagement with said bolster, and means on said wedge and shoe for locking them together for removal of said wedge, shoe and spring means as a unit.

19. In a friction unit arranged to be associated with a side frame and a bolster of a railway truck, the combination of, a wedge having at a lower extremity thereof a horizontal surface, a wall of said wedge upstanding from said surface and having a side surface forming an acute angle with said horizontal surface, transversely spaced diagonal faces on said wedge above said horizontal surface, a shoe having rockable engagement with said diagonal faces, and spring means within said shoe and wedge for urging said shoe into said rockable engagement.

20. In a friction unit arranged to be associated with a side frame and a bolster of a railway truck, the combination of, a wedge having at a lower extremity thereof a horizontal surface, a wall of said wedge upstanding from said surface and having a side surface forming an acute angle with said horizontal surface, transversely spaced diagonal faces on said wedge above said horizontal surface, a shoe having rockable engagement with said diagonal faces, spring means within and seated on said wedge and shoe and acting in opposite directions thereagainst for urging said shoe into rockable engagement, and overlapping means on said wedge and shoe for accommodation of a means for locking said wedge, shoe and spring means together as a unit.

21. In a railway truck having a side frame member and a vertically movable member, the combination of a pocket in one of said members, a wedge seated in and restrained against vertical movement relative thereto by said pocket, an inclined face on said wedge, a shoe frictionally engaging said other member and supported on said face, and spring means acting in opposite directions against said wedge and shoe for urging said shoe against said wedge and said other member.

22. In a railway truck having a side frame member and a vertically movable member, the combination of a wedge carried by and fixed against vertical movement relative to one of said members, said wedge having a face inclined toward said other member, a shoe frictionally engaging said other member and supported on said face, and spring means interposed between and acting oppositely on said wedge and shoe for urging said shoe against said wedge and said other member.

23. In a friction unit for association with a side frame member and a vertically movable member of a railway truck, the combination of a wedge having a horizontal surface at one extremity thereof, a wall of said wedge extending substantially vertically from said surface and having a surface bearing against one of said members and inclined upwardly toward said other members, a diagonal face on said wedge spaced vertically from said horizontal surface, a shoe supported on said diagonal face, and spring

means between said wedge and shoe for urging said shoe and wedge into engagement.

24. In a friction unit for association with a side frame member and a vertically movable member of a railway truck, the combination of a wedge having a horizontal surface at one extremity thereof, a wall of said wedge extending substantially vertically from said surface and having a surface bearing against one of said members and inclined upwardly toward said other member, transversely spaced diagonal faces on said wedge spaced vertically from said horizontal surface, a shoe supported on said diagonal faces, and spring means between said wedge and shoe for urging them into engagement.

25. In a frictional unit for association with a side frame and a vertically movable member of a railway truck, the combination of a wedge having a spring seat, a face on said wedge and disposed at an oblique angle relative to said spring seat, a diagonal face on said wedge removed from said angularly disposed face, a shoe contacting and supported on said diagonal face, a spring seat on said shoe and overlapping said first named spring seat, and spring means interposed between and acting oppositely on said spring seats for urging said shoe into contact with said diagonal face.

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