Oct. 25, 1949. L. A. LEHRMAN 2,485,972

SNUBBED TRUCK

Filed July 12, 1945 3 Sheets-Sheet 1

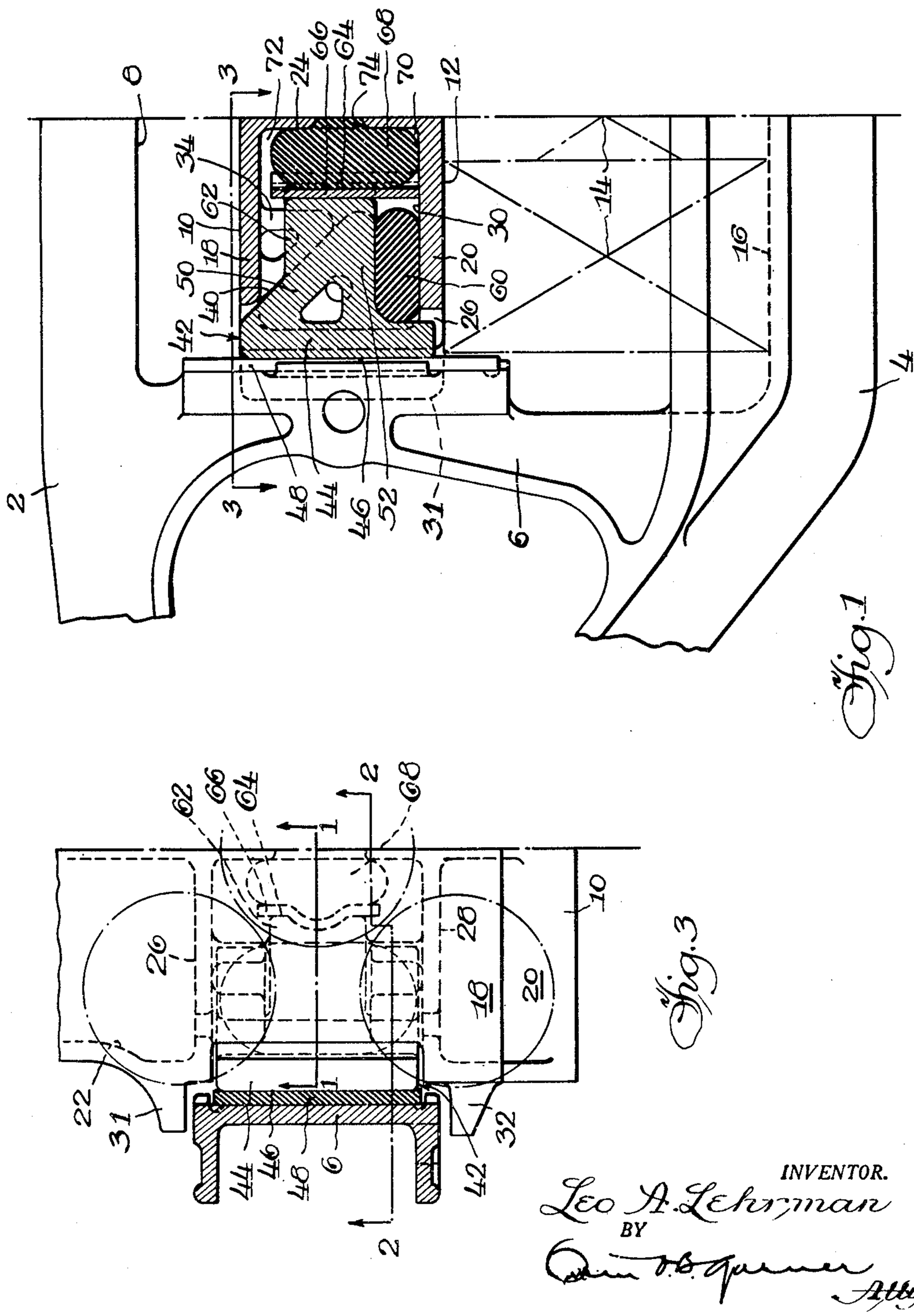

Fig. 1

Fig. 3

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SNUBBED TRUCK

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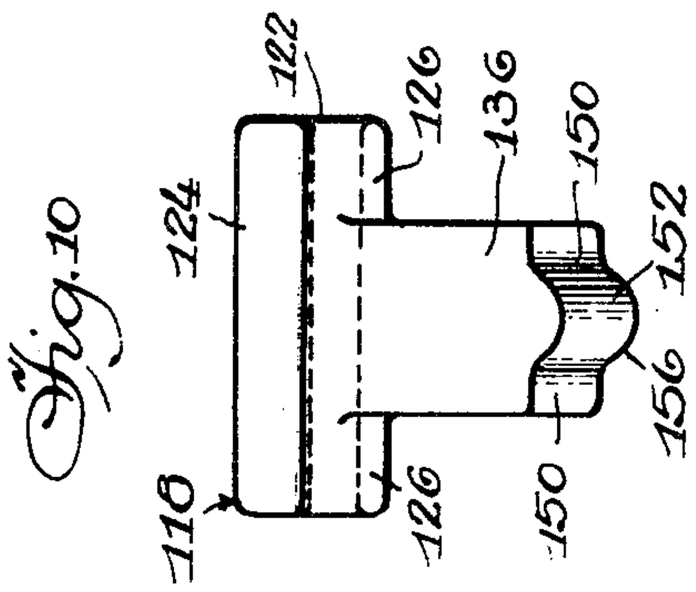

Fig. 10

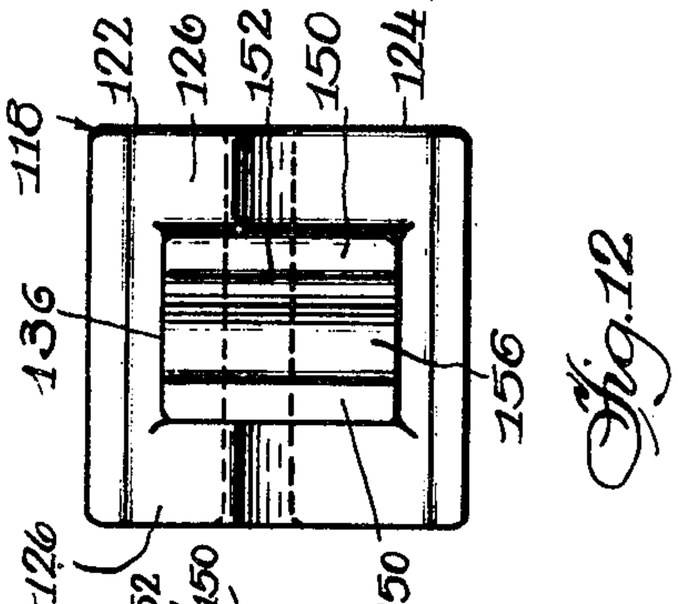

Fig. 12

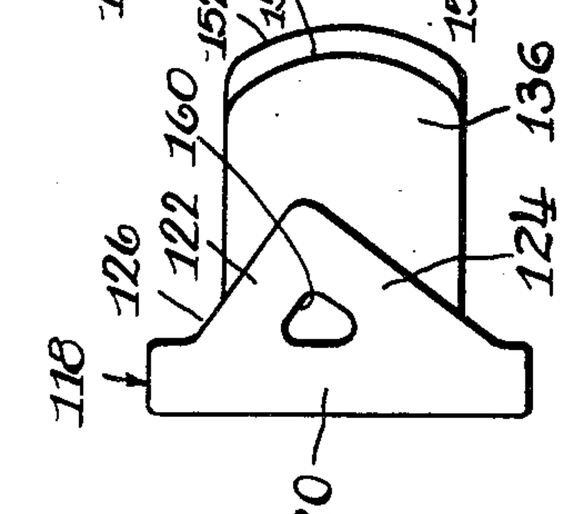

Fig. 11

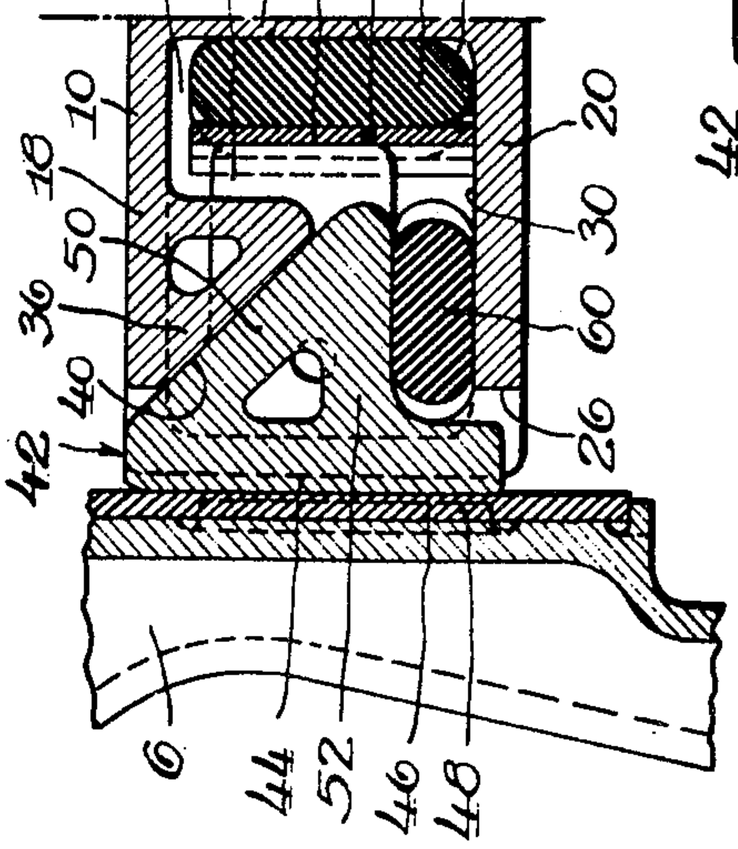

Fig. 2

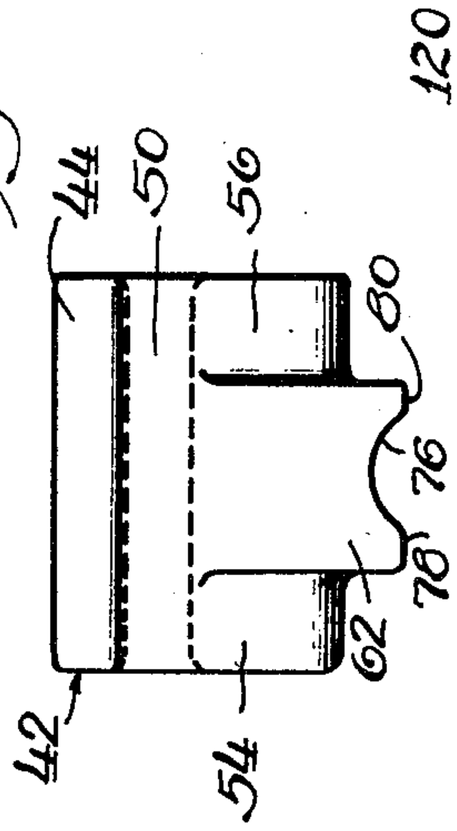

Fig. 4

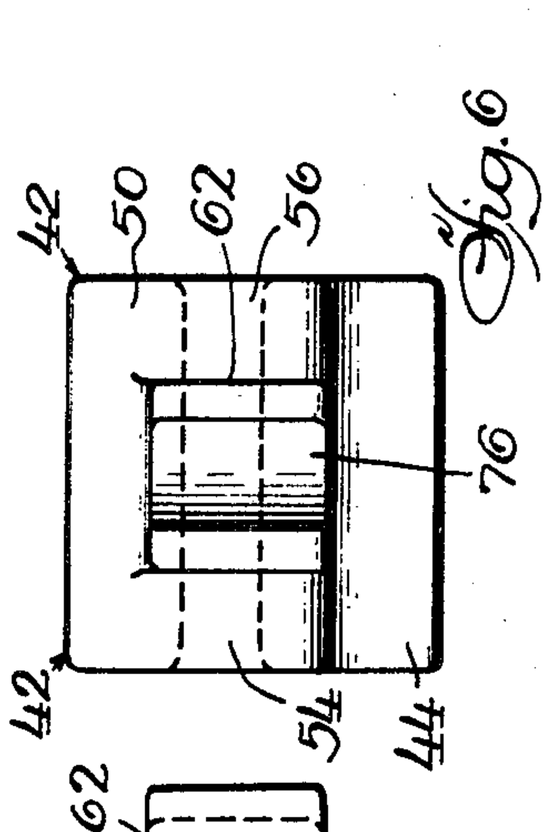

Fig. 6

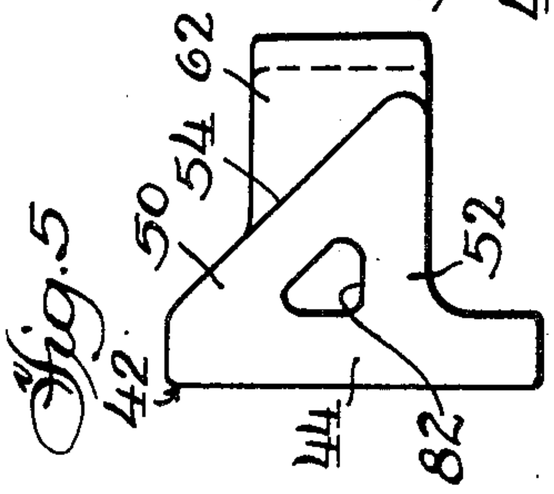

Fig. 5

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SNUBBED TRUCK

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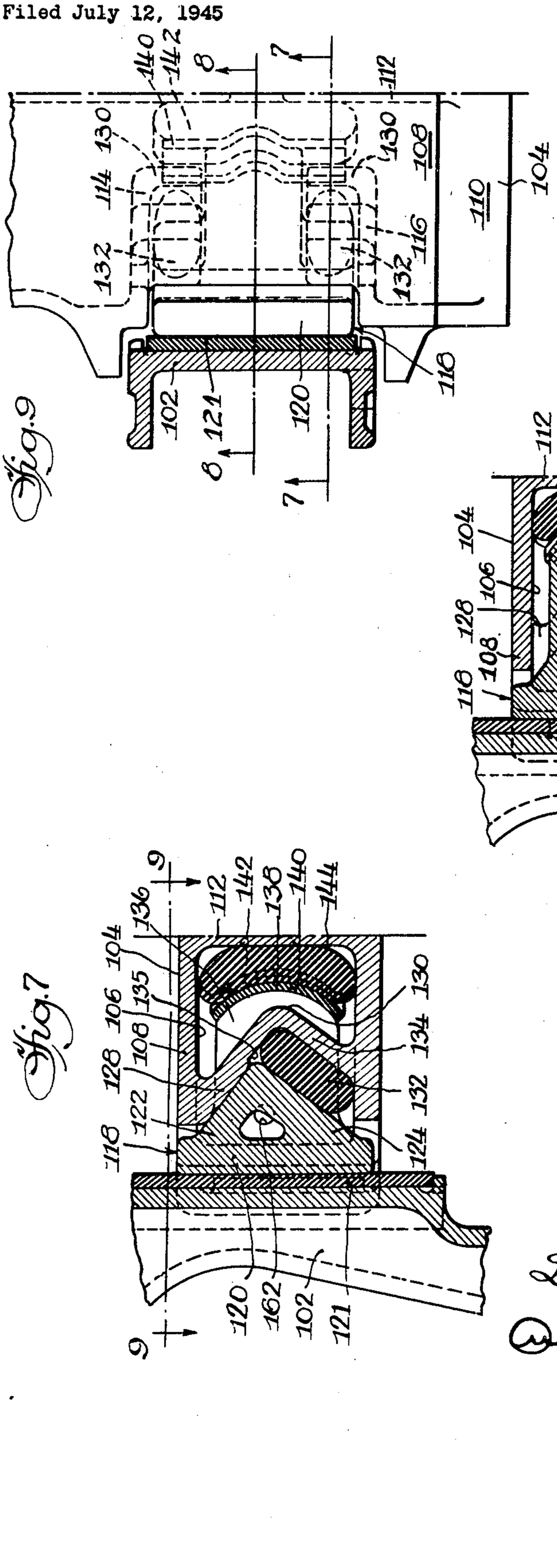

Fig. 9

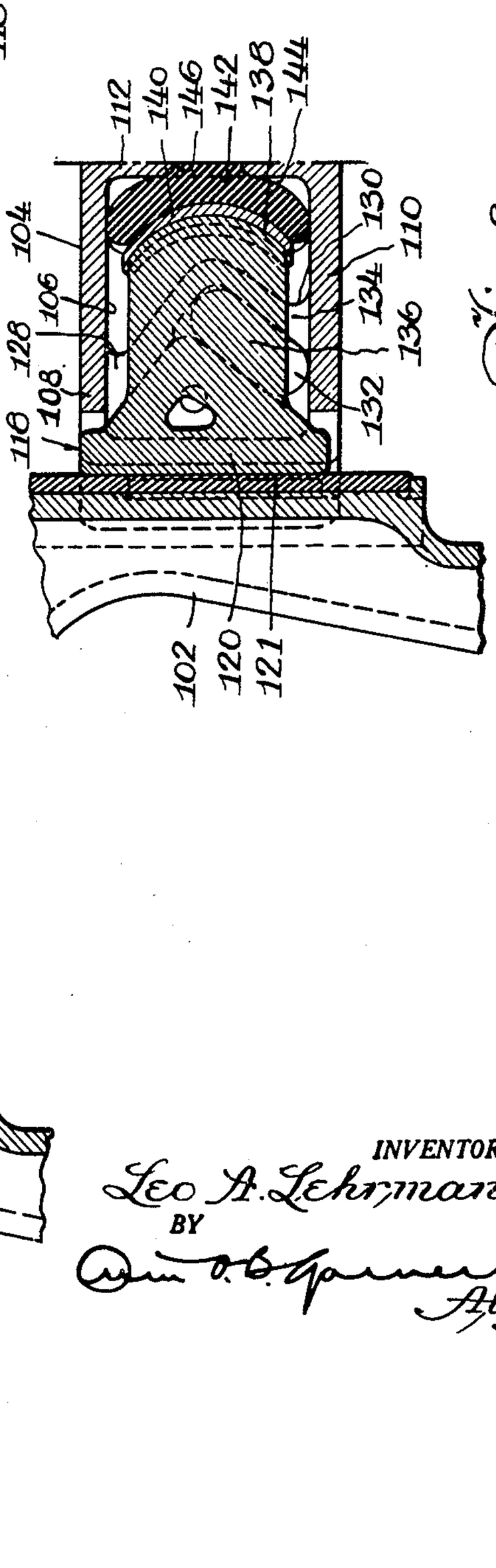

Fig. 8

Fig. 7

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Patented Oct. 25, 1949 2,485,972

UNITED STATES PATENT OFFICE

2,485,972

SNUBBED TRUCK

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Application July 12, 1945, Serial No. 604,624

20 Claims. (Cl. 105—197)

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My invention relates to railway car trucks and more particularly to a freight car truck utilizing snubbing or friction control means for dampening synchronous oscillations of the springs normally used to support the bolster from the side frames.

The general object of my invention is to design such a railway car truck wherein friction means supported by the bolster have associated therewith suitable control means for insuring substantially constant frictional bearing of the friction means against the side frame columns of the truck throughout the life of the friction means and within the range of permissible wear of the friction parts.

A further object of my invention is to devise a railway car truck wherein friction shoes may be mounted in each side of each bolster end and in frictional engagement with the side frame columns and wherein resilient means may be so associated with the friction shoes as to insure the same being maintained in said frictional engagement despite relative angling between the bolster and side frames.

A more specific object of my invention is to devise a railway car truck such as that described wherein friction shoes may be mounted in each side of each bolster end, each shoe being in wedge engagement with a bolster wall and in frictional engagement with a side frame column and wherein resilient means may be so associated with the friction shoes as to insure the shoes being maintained with sufficient bearing against the columns and the bolster wedge surfaces.

In the drawings:

Figure 1 is a fragmentary side elevation of a railway car truck embodying my invention, the view being shown partly in section in order to more clearly illustrate the arrangement of the friction parts, said sectional view being taken approximately in the longitudinal vertical plane bisecting the side frame as indicated by the line 1—1 of Figure 3, and Figure 2 is a further fragmentary sectional view taken approximately in the longitudinal vertical plane indicated by the line 2—2 of Figure 3.

Figure 3 is a fragmentary top plan view of the car truck shown in Figures 1 and 2, partly in section, the view being taken approximately in the plane indicated by the line 3—3 of Figure 1;

Figures 4, 5 and 6 are views illustrating my novel friction shoe utilized in the car truck shown in Figures 1, 2 and 3, Figure 4 being a top plan view thereof, Figure 5 a side elevation thereof,

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and Figure 6 a view thereof looking toward the right of the shoe as seen in Figure 5;

Figure 7 is a fragmentary view comparable to that shown in Figure 1, illustrating a modified form of my invention, said view being shown partly in section in the longitudinal vertical plane indicated by the line 7—7 of Figure 9, and Figure 8 is a fragmentary sectional view taken in the longitudinal vertical plane indicated by the line 8—8 of Figure 9;

Figure 9 is a fragmentary top plan view of the car truck shown in Figures 7 and 8, partly in section, said section being taken approximately in the plane indicated by the line 9—9 of Figure 7; and

Figures 10, 11 and 12 are views illustrating the novel form of friction shoe utilized in the car truck shown in Figures 7, 8 and 9, Figure 10 being a top plan view thereof, Figure 11 being a side elevation thereof, and Figure 12 a view looking toward the right of the shoe as seen in Figure 11.

In each of the views only one half of the bolster and side frame structures are shown inasmuch as the arrangement is similar at opposite ends and opposite sides of the truck.

Referring first to the modification illustrated in Figures 1 to 6, the side frame is of well-known truss type having the compression member 2, the tension member 4, and the column 6, the bolster opening 8 receiving the bolster 10 supported as at 12 from the coil springs diagrammatically indicated at 14, 14, said springs being positioned as at 16 on the spring seat portion of the tension member in well-known manner.

The end portion of the bolster may be of box section having a top wall 18, a bottom wall 20, a side wall 22, a center rib 24, and the spaced transverse inboard and outboard ribs 26 and 28 (Figure 3) defining with said top and bottom walls a friction shoe pocket 30 at each side of the bolster end, the adjacent side wall being cored away intermediate the webs 26 and 28. The bolster is formed with the laterally extending inboard and outboard guide lugs 31 and 32 receiving the adjacent column therebetween.

At the inboard and outboard sides of each pocket are formed the ledges 34 and 36 merging with the top wall 18 and with the respective inboard and outboard webs 26 and 28, each ledge having a diagonal surface sloping upwardly toward the adjacent column 6 and having complementary engagement as at 40 with the associated friction shoe, generally designated 42.

One of the friction shoes 42 is shown in detail in Figures 4 to 6, inclusive, said shoe comprising

a main friction wall 44 frictionally engaged as at 46 with the adjacent column-mounted wear plate 48. Integrally formed with the main friction wall 44 of the friction shoe 42 are the diagonal and horizontal walls 50 and 52, the diagonal wall 50 presenting the spaced wedge faces 54 and 56 urged into complementary engagement as at 40 with the diagonal surfaces of the inboard and outboard bolster ledges 34 and 36 by means of a resilient pad 60 compressed between the bottom wall 20 of the bolster and the horizontal wall 52 of the shoe, said pad consisting of a solid block of rubber composition or other suitable material.

Extending outwardly of the diagonal wall 50 of each shoe intermediate the spaced wedge faces 54 and 56 thereof and between the ledges 34 and 36 of the bolster is a vertical wall 62 formed on said shoe and bearing as at 64 against the spring plate or seat 66, said spring seat extending longitudinally of the bolster in order to afford bearing for the full length of the resilient pad 68, one face of which may be vulcanized thereto. The opposite face of the pad 68 may bear against the center rib 24 and vertical expansion of the pad may be accommodated by the clearance afforded as at 70 between the pad and the bottom wall 20 of the bolster as well as the clearance afforded as at 72 above the pad and the top wall 18 of the bolster. A portion of the center rib 24 may be cored away to form therein an opening 74 (Figure 1) to accommodate the flow of the pad under compression as well as to permit distortion of the pads at opposite sides of the center rib 24 of the bolster so that the pads will bear against each other under conditions of maximum distortion or flow of the resilient material. It will be apparent that the pad 68 will be subjected to a certain amount of compression upon assembly of the shoe with the bolster and positioning of the shoe in abutment with the adjacent column.

In this arrangement, the pad 60 is under such compression as to maintain the friction shoe 42 seated at all times against the spaced ledges 34 and 36 of the bolster and to operatively urge the shoe upwardly into wedge engagement therewith and at the same time the pad 68 will constantly urge the friction shoe outwardly and maintain it in substantially upright position irrespective of any angling of the bolster permitted within existing tolerances under service conditions.

It may be noted that the wall 62 of the shoe 42 is formed with an arcuate recess 76 centrally thereof and extending from top to bottom thereof in complementary engagement with the central portion of the spring plate 66 and is also formed with the plane faces 78 and 80 at opposite sides of the recess 76 in complementary engagement with the lateral ends of the spring plate 66 whereby the shoe is maintained in a central position between the walls 26 and 28 of the pocket by the pad 68 being placed in shear to yieldably resist lateral movement of the shoe in the bolster pocket while vertical movement of the shoe will be permitted as the shoe is moved diagonally along the ledges of the bolster under service conditions.

Each shoe may have an opening 82 cored horizontally therethrough aligned with openings in the inboard and outboard walls 26 and 28 of the pocket for the reception of pin means which may position the shoe in assembled relationship with the bolster when the shoe has been urged inwardly of the pocket whereby clearance will be afforded from the adjacent side column to permit the assembly or disassembly of the bolster with the side frame.

In the assembly of the friction devices with the bolster, the pads 68 may be inserted in the respective pockets 30 in the sides of the bolster and positioned against the center rib 24 of the bolster. The pads 60 may then be positioned on the bottom wall of the bolster and the shoes inserted in the bolster pockets with the wedge faces 54 and 56 in engagement with the diagonal surfaces of the wedges 34 and 36 of the bolster and the shoes may thereafter be urged along the latter surfaces to place the pads 60 and 68 under compression until the opening 82 in each shoe is in alignment with the openings in the inboard and outboard walls of the associated pocket for the reception of pin means.

In the modification illustrated in Figures 7 to 12, inclusive, the side frame structure is similar to that of the modification previously described, the side frame comprising the column 102 having the bolster end 104, supported adjacent thereto by the bolster springs (not shown), said bolster end comprising a pocket 106 in each side thereof defined by the top and bottom walls 108 and 110, the center rib 112 and the transverse inboard and outboard walls 114 and 116 spaced from the center rib 112. Received within each pocket 106 is a friction shoe, generally designated 118, and shown in detail in Figures 10, 11 and 12, said shoe comprising the main friction wall 120 in engagement with the friction plate 121 fixed to the column 102 and having angularly arranged walls 122 and 124 merging with the wall 120, said wall 122 having spaced wedge surfaces 126, 126 in engagement with the diagonal portions 128, 128 of the webs 130, 130 extending between the top and bottom walls 108 and 110 of the bolster within the pocket 106 at each of the inboard and outboard sides thereof and merging with the respective inboard and outboard walls 114 and 116, said walls 124 of the shoe 118 having engagement with resilient pads 132, 132 seated on the diagonal portions 134, 134 of the webs 130, 130. It may be noted from a consideration of Figure 7 that each of the diagonal portions 128, 128 of each of the webs 130, 130 is relieved as at 135 to prevent wearing of shoulders thereon by the movement of the shoes and to allow flow of the associated pad 132 upon inward movement of the shoe along the diagonal portions 128, 128 of the webs 130, 130. Integrally formed with the walls 122 and 124 of each shoe and projecting laterally therefrom between the webs 130, 130 is the vertical wall 136 in engagement as at 138 with a spring plate 140 vulcanized to the resilient pad 142 which may bear as at 144 against the center rib of the bolster, vertical expansion of said pad being restricted by its bearing against the top and bottom walls of the bolster end, there being some clearance afforded above and below the pad. The rib is provided with an opening 146 therein permitting the flow of the pad under compression as well as to permit distortion of the pads at opposite sides of the rib so that the pads may bear against each other.

An important feature of the present modification is the formation of the rear wall of the shoe 118 in complementary engagement with the spring plate 140 as seen in Figures 10, 11 and 12. The rear wall of the shoe is formed with the spaced faces 150, 150 arcuately curved from top to bottom thereof with the central projecting portion 152 of the wall, intermediate the faces 150,

150, presenting a face 156 which is of substantially toric shape inasmuch as it has a curvature extending vertically over a substantially greater radius than the curvature across the same, said faces 150, 150 and 156 being in complementary engagement with the spring plate 140. This construction of the rear face of the wall 136 of the shoe 118 and the surface of the plate 140 in engagement therewith allows a pad of maximum volume to be mounted in the pocket of the bolster and thereby permit a larger compression area of the pad to be utilized. Another advantage resides in this construction in that the shoe is positioned in such manner that the rubber pad 142 will tend to maintain the shoe in a central upright position by restricting vertical and lateral movement of the shoe in the pocket.

It will be apparent that in the arrangement described, the pads 132 under compression between the shoe and the bolster will tend to urge the shoe outward of the pocket along the diagonal portions 128, 128 of the webs 130, 130 to engage the friction wall 120 of the shoe with the adjacent column. At the same time, the pad 142 under compression between the shoe and the bolster will constantly urge the shoe outwardly toward the adjacent column and maintain the shoe in full face engagement with the column friction plate irrespective of vertical and horizontal angling of the bolster relative to the side frame columns under service conditions.

Each shoe is provided with a horizontal opening 160 therethrough for alignment with openings 162 in the transverse bolster walls by means of a shoe-positioning pin received within the openings for positioning the shoes in assembled relationship with the bolster whereby the shoe may be forced into the associated pocket to provide sufficient clearance from the adjacent side column in the assembly or disassembly of the bolster with the side frame.

In the assembly of the friction devices with the bolster, each rubber pad 142 may be inserted within the open end of the bolster between the top and bottom walls thereof and between the center rib 112 and the adjacent spaced webs 130 and thereafter the pads 132, 132 may be positioned on the diagonal portions of the webs 130, 130 in each pocket 106 in the bolster. The shoes may then be inserted in the pockets 106 and urged inwardly along the wedge surfaces of the diagonal portions 128, 128 of the webs 130, 130 until the opening 162 in each shoe is aligned with the openings in the inboard and outboard walls 114 and 116 whereupon pin means may be inserted within the openings for maintaining the shoes in a retracted position within the bolster for subsequent assembly of the bolster with the side frames.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown which are merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame between said columns, a pocket in each side of said bolster comprising spaced wedge surfaces sloping upwardly toward the adjacent column, a friction shoe in each pocket extending between said wedge surfaces and having spaced wedge faces in engagement with said surfaces,

and a friction face bearing on the adjacent column, and a plurality of resilient means associated with each shoe, one of said resilient means being compressed between a wall of said shoe and a spaced wall of said bolster and the other of said resilient means being compressed between another wall of said shoe and another wall of said bolster, said resilient means comprising distortable rubber pads respectively urging said shoe along said wedge surfaces and outwardly into engagement with the adjacent column.

2. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame between said columns, a pocket in each side of said bolster adjacent each column, a friction shoe in each pocket comprising a friction surface on one side thereof in engagement with the adjacent column and angularly arranged faces on the opposite side thereof, one of said faces being in wedge engagement with said bolster and the other face affording a spring seat, resilient means compressed between said spring seat and a spaced wall of said bolster, and resilient means compressed between a portion of said shoe projecting from said faces and another wall of said bolster, said resilient means comprising distortable resilient pads respectively urging said shoe into said wedge engagement and outwardly into engagement with the adjacent column.

3. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame between said columns and comprising top and bottom walls, a center rib and transverse walls defining a pocket at each side of said bolster, spaced webs in each pocket at the inboard and outboard sides thereof each comprising a wedge surface, and a spring seat, a shoe in each pocket in engagement with each of said wedge surfaces, a resilient member compressed between said shoe and each of said seats and operative to urge said shoe along said wedge surfaces, and resilient means between said shoe and a spaced wall of said bolster and operative to urge said shoe outwardly into engagement with an adjacent column.

4. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns, a pocket in each side of said bolster comprising spaced inboard and outboard webs each having a wedge surface sloping upwardly toward the adjacent column and a spring seat sloping downwardly toward the adjacent column, a friction shoe in each pocket in engagement with said wedge surfaces, resilient means compressed between said spring seats and said shoe and operative to urge said shoe along said surfaces, and resilient means compressed between a portion of said shoe extending between said surfaces and a spaced wall of said bolster and urging said shoe outwardly of said bolster.

5. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns, a pocket in each side of said bolster comprising spaced coplanar inboard and outboard surfaces and spaced coplanar spring seats, said surfaces and said seats being angularly arranged and sloping toward the adjacent column, a friction shoe in each pocket in engagement with said surfaces and in frictional engagement with the adjacent column, resilient means compressed between said shoe and said spring seats urging said shoe along said surfaces, and independent resilient means com-

pressed between a portion of said shoe extending between said surfaces and a spaced wall of said bolster.

6. In a railway car truck, a side frame comprising spaced columns, a bolster between said columns comprising top and bottom walls, a center rib and transverse webs defining a pocket in each side of said bolster adjacent each column, spaced inboard and outboard wedge surfaces in each pocket on one of said walls, a friction shoe in each pocket in engagement with said wedge surfaces, spaced spring seats in each pocket on the other of said walls, resilient means compressed between said spring seats and said shoe and urging said shoe along said surfaces, and independent resilient means compressed between said center rib and a portion of said shoe extending between said surfaces and urging said shoe outwardly of said bolster.

7. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame between said columns, a pocket in each side of said bolster comprising spaced wedge surfaces sloping upwardly toward the adjacent column, a friction shoe in each pocket having spaced wedge faces in engagement with said surfaces, a wall on said shoe intermediate said faces and extending between said wedge surfaces, a resilient member compressed between said wall and a spaced bolster wall and operative to urge said shoe outwardly into engagement with said column, and a resilient pad compressed between another wall of said shoe and another wall of said bolster and operative to urge said shoe along said wedge surfaces.

8. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame between said columns and having a pocket in each side thereof comprising spaced wedge surfaces sloping upwardly toward the adjacent column, a friction shoe in each pocket having spaced wedge faces in engagement with said surfaces, a wall on said shoe intermediate said faces and extending between said surfaces, a resilient member compressed between said wall and a spaced bolster wall and operative to urge said shoe outwardly into engagement with said column, and a resilient member compressed between the bottom of said shoe and another wall of said bolster.

9. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame between said columns and having a pocket in each side thereof comprising spaced wedge surfaces sloping upwardly toward the adjacent column, a friction shoe in each pocket in engagement with said surfaces and having a wall extending between said surfaces, a resilient member compressed between the wall of said shoe and a vertical wall of said bolster and operative to urge said shoe outwardly into engagement with said column, and a resilient member compressed between a diagonal wall of said shoe and a diagonal wall of said bolster and operative to urge said shoe along said wedge surfaces.

10. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns and having a pocket in each side thereof adjacent each column, spaced coplanar inboard and outboard diagonal surfaces in each pocket sloping toward the adjacent column, a friction shoe in each pocket engaging said surfaces, a resilient pad compressed between said shoe and a spaced wall of said bolster urging said shoe along said surfaces, and resilient means compressed between a portion of said shoe extending between said surfaces and a spaced wall of said bolster and urging said shoe outwardly of said bolster.

11. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns, a pocket in said bolster adjacent each column, a pair of spaced wedge surfaces in each pocket, a friction shoe in each pocket in engagement with said surfaces and engaging the adjacent column, a resilient pad compressed between said shoe and a spaced wall of said bolster, and a resilient member compressed between a portion of said shoe extending between said surfaces and another wall of said bolster, said resilient pad and member respectively urging said shoe along said wedge surfaces and outwardly into engagement with the adjacent column.

12. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns, a pocket in each side of said bolster comprising spaced inboard and outboard webs each having a wedge surface sloping upwardly toward the adjacent column and a spring seat sloping downwardly toward the adjacent column, a friction shoe in each pocket in engagement with said wedge surfaces, and resilient means compressed between said spring seats and said shoe urging said shoe along said surfaces and into engagement with the adjacent column.

13. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns, a pocket in said bolster adjacent each column, a friction shoe in each pocket having a friction face on one side thereof and diagonally arranged surfaces on the opposite side thereof, a resilient pad compressed between a wall of said bolster and one of said surfaces and operative to urge the other of said surfaces into wedge engagement with another wall of said bolster and said friction face into engagement with the adjacent column, and a block of resilient material compressed between a portion of said shoe extending between said surfaces and another wall of said bolster and complementing the action of said pad in urging said friction face into engagement with the adjacent column, said pad and said block cooperating with each other to maintain said shoe in a substantially upright position irrespective of any angling of the bolster.

14. In a railway car truck, a side frame comprising spaced columns, a bolster supported between said columns, a pocket in each side of said bolster adjacent each column, each of said pockets having a wedge surface and a spring seat spaced therefrom and sloping toward the adjacent column, a friction shoe in each pocket having diagonally arranged surfaces in engagement with said surface, resilient means compressed between said spring seat and said shoe and urging said shoe along said surface and into engagement with the adjacent column, and a block of resilient material compressed between a portion of said shoe extending between said surfaces and another wall of said bolster for complementing the action of said resilient means, said resilient means and said block cooperating with each other to maintain said shoe in a substantially upright position in spite of any angling of the bolster.

15. In a railway car truck, a side frame comprising spaced columns, a bolster supported between said columns and having a pocket in each

side thereof adjacent each column, a wedge surface in each pocket, a friction shoe with diagonally arranged surfaces in each pocket, a resilient pad compressed between said shoe and a spaced wall of said bolster and operative to urge said shoe along said surface and into engagement with the adjacent column, and another resilient pad compressed between a portion of said shoe extending between said surfaces and another wall of said bolster, said pads cooperating with each other to maintain said shoe in a substantially upright position irrespective of any angling of the bolster.

16. In a railway car truck, a side frame comprising spaced columns, a bolster between said columns having a pocket adjacent each column, a wedge surface in said pocket sloping toward the adjacent column, a friction shoe in each pocket, resilient pads compressed between spaced surfaces on said shoe and an adjacent wall of said bolster urging said shoe along said wedge surface and outwardly of said bolster and into frictional engagement with the adjacent column, a block of resilient material compressed between a portion of said shoe extending between said surfaces and another wall of said bolster, and complementing the action of said pads in urging said shoe into engagement with the adjacent column, and an opening in said last-mentioned bolster wall for accommodating the bulging of said block as it is compressed.

17. In a railway car truck, a side frame comprising a column, a bolster spring-supported by said frame adjacent said column, said bolster comprising a pocket containing converging surfaces, a friction shoe in said pocket, a resilient pad compressed between the shoe and one surface for urging the shoe into wedge engagement with the other surface and into frictional engagement with the column, said other surface being relieved at the inner extremity thereof to accommodate bulging of said pad upon compression thereof.

18. In a railway car truck, a side frame comprising a column member, a relatively movable member supported from said frame and having

a pocket adjacent said column, a friction shoe in said pocket, and resilient pads respectively urging said shoe into wedge engagement with said movable member and outwardly of said last-mentioned member into frictional engagement with the adjacent column, said pads exerting forces cooperating with each other for maintaining said shoe in a substantially upright position in spite of any angling of said movable member.

19. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame and having a pocket adjacent each column, friction shoes in said pockets bearing against wedge surfaces on the bolster, and a plurality of resilient pads compressed between said shoes and said bolster, urging each shoe into engagement with the adjacent column and cooperating with each other for maintaining said shoe in a substantially upright position irrespective of any angling of said bolster.

20. In a railway car truck, a side frame comprising a column, a bolster spring-supported from said frame adjacent said column, a pocket in said bolster, spaced wedge surfaces on said bolster within said pocket, a friction shoe engaged with said surfaces and frictionally engaging said column, a horizontal spring compressed between said shoe and a wall of said bolster for urging said shoe against the column, and a resilient pad compressed between vertically spaced abutment surfaces on said shoe and said bolster respectively for urging said shoe against said surfaces.

LEO A. LEHRMAN.

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