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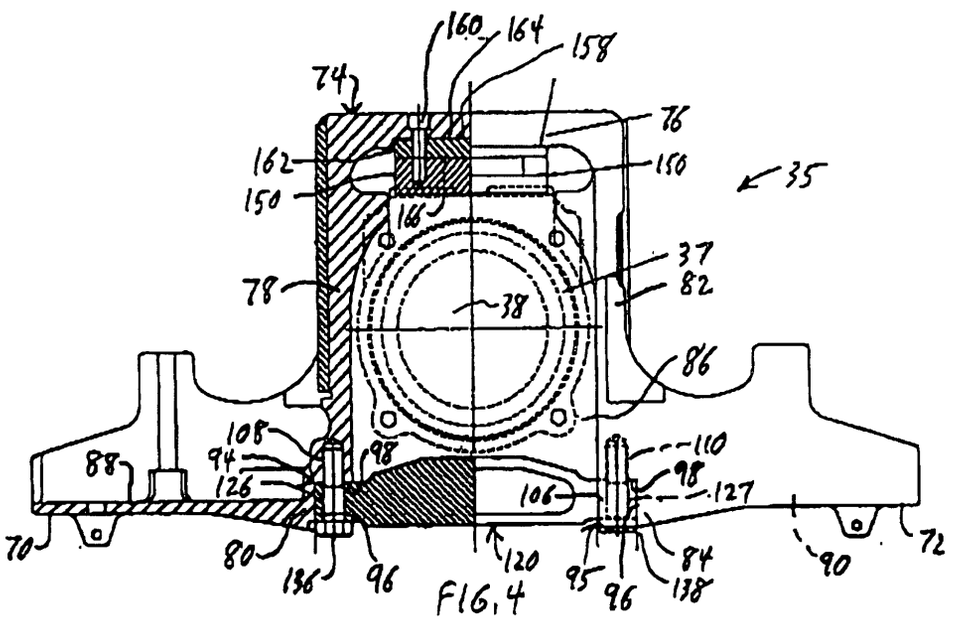
(71) Applicant: **Naco Incorporated**
Lombard, Illinois 60148 (US)

(72) Inventor: **Hewitt, Paul**
Arbroath, Angus DD11 2RJ (GB)

(74) Representative: **Goodenough, Nigel et al**
A.A. Thornton & Co.
235 High Holborn
London WC1V 7LE (GB)

(54) Railcar truck

(57) A saddle (35) and pedestal (24) for a railcar truck (20) adapted to receive a bearing and a wheel axle. The saddle (35) includes a roof (76) having a roof cavity (92), a first side wall extending downwardly from the roof to a first end having a first pocket and a second side wall extending downwardly from the roof to a second end having a second pocket. A rocker member (150) is adapted to be inserted into the roof cavity (92) of the roof (76) and to engage the bearing. One or more fasteners removably attach the rocker member (150) to the roof (76) such that the rocker member (150) is selectively removable for maintenance. One or more shims may be placed between the rocker member and the roof to adjust the position of the rocker member. A removable link member (120) extends between the first and second ends of the side walls. The link member (120) includes a first end (122) adapted to be inserted into the first pocket and a second end (124) adapted to be inserted into the second pocket. The link member maintains a minimum spacing between the ends of the side walls. The pedestal (24) includes a first pedestal jaw (26) having a first wear member and a second pedestal jaw (28) having a second wear member. The wear members are formed of cast iron which has a coefficient of friction with steel or a cicular iron of approximately 0.15.



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Description

Related Applications

[0001] This application claims the benefit of U.S. Provisional Application No. 60/231,560, filed September 11, 2000.

Background of the Invention

[0002] The present invention is directed to a railcar truck, and in particular to a railcar truck having a side frame pedestal including a cast iron wear plate adapted to engage a friction wedge and a saddle having an adjustable and removable rocker member and a removable link arm.

[0003] Railcar trucks include a pair of spaced apart generally parallel side frames connected by a transverse bolster. Each side frame includes a pedestal at each end that is adapted to be connected by a saddle to a wheel set. A plurality of springs extend between the saddle and the side frame such that the side frame is resiliently supported on the saddle. Friction wedges are disposed between the saddle and the side frame to dampen vertical, lateral and longitudinal movement of the side frame with respect to the saddle.

Summary of the Invention

[0004] A saddle and a pedestal for a railcar truck adapted to receive a bearing and a wheel axle. The saddle includes a roof having a roof cavity, a first side wall extending downwardly from the roof, and a second side wall extending downwardly from the roof. The first and second side walls are spaced apart from one another such that the bearing and wheel axle are adapted to be located between the first and second side walls. A rocker member includes a top wall and a bottom wall. The top wall of the rocker member is adapted to be inserted into the roof cavity of the roof and the bottom wall of the rocker member is adapted to engage the bearing. One or more fasteners removably attach the rocker member to the roof such that the rocker member is selectively removable and replaceable for maintenance. One or more shims may be located between the top wall of the rocker member and the roof to selectively adjust the position of the rocker member with respect to the roof. A sheet-like backing member may be inserted in the roof cavity between the roof and the rocker member or shim to accommodate any surface irregularities in the roof.

[0005] The first side wall of the saddle includes a first end spaced apart from the roof and the second side wall of the saddle includes a second end spaced apart from the roof. A link member extends between the first end of the first side wall and the second end of the second side wall. The link member includes a first end adapted to engage the first end of the first side wall and a second end adapted to engage the second end of the second side wall. The link member is selectively removably from the first side wall and the second side wall. The first end of the first side wall includes a first pocket having rear wall, atop wall and a pair of wing members which form the first pocket. The second end of the second side wall includes a second pocket including a rear wall, a top wall and a pair of wing members which form the second pocket. The first end of the link member is adapted to be inserted within the first pocket between the wing members such that it engages the rear wall and top wall of the first pocket. The second end of the link member is adapted to be inserted into the second pocket between the wing members such that the second end engages the rear wall and top wall of the second pocket. The top wall of the first pocket includes a first bore and the top wall of the second pocket includes a second bore. The first end of the link member includes a first aperture and the second end link member includes a second aperture. A first fastener is adapted to be inserted through the first bore and the first aperture to removably attach the first end of the link member to the first end of the first side wall. A second fastener is adapted to be inserted through the second bore and the second aperture to removably attach the second end of the link member to the second end of the second side wall.

[0006] The pedestal includes a first pedestal jaw having a first interior face and a second pedestal jaw including a second interior face. A first wear member is attached to the first face of the pedestal jaw and includes a front friction surface adapted to engage a first friction wedge. A second wear member is attached to the second face of the second pedestal jaw and includes a front friction surface adapted to engage a second friction wedge. The first wear member and the second wear member are formed from the material having a kinetic coefficient of friction with steel of approximately 0.15 such as cast iron. A thin sheet-like backing member may be located between each wear member and an interior face of the pedestal jaw.

Brief Description of the Drawing Figures

[0007] Figure 1 is a partial cross sectional view of a rail car truck of the present invention.

[0008] Figure 2 is a front view of the wear member of the pedestal of the truck side frame.

[0009] Figure 3 is a side elevational view of the wear member taken along line 3-3 of Figure 2.

[0010] Figure 4 is a partial cross-sectional view of the saddle of the railcar truck shown with a shim.

[0011] Figure 5 is a top plan view of the saddle of the railcar truck.

[0012] Figure 6 is a partial cross-sectional side view of the saddle with the shim removed.

[0013] Figure 7 is a cross-sectional view taken along line 7-7 of Figure 6.

Detailed Description of the Preferred Embodiment

[0014] The railcar truck 20 as shown in Figure 1 includes a pair of spaced apart and generally parallel side frames 22 (only one shown). The side frames 22 are connected to one another by a transverse bolster (not shown). Each side frame 22 includes a pedestal 24 at each end. The pedestal 24 includes a first pedestal jaw 26 and a second pedestal jaw 28. A pedestal cavity 30 is formed between the first and second pedestal jaws 26 and 28. The first pedestal jaw 26 includes an inclined face 32 and the second pedestal jaw 28 includes an inclined face 34.

[0015] A saddle 35 is adapted to be located within the pedestal cavity 30. A plurality of resilient coil springs 36 extend between the saddle 35 and the pedestal 24 such that the pedestal 24 is resiliently supported by the springs 36. A bearing 37 and an axle 38 of a wheel set is coupled to the saddle 35 such that the axle 38 is rotatable with respect to the saddle 35. A plurality of friction wedges 39 having wear surfaces formed of composite material and steel or acicular iron, are resiliently biased by one or more springs 36 into engagement with the pedestal 24 and the saddle 35 to dampen vertical movement of the pedestal 24 with respect to the saddle 35,

[0016] A wear member 40 is removably attached to the inside surface the inclined face 32 of the first pedestal jaw 28 and a wear member 40 is also attached to the inside surface of the inclined face 34 of the second pedestal jaw 28. The wear member 40, as best shown in Figure 2, includes a generally rectangular wear plate 42 having a top edge 44, a bottom edge 46, and spaced apart and generally parallel first and second side edges 48 and 50 which extend between the top and bottom edges 44 and 46. The wear plate 42 includes a generally planar front friction surface 52 and a generally planar rear surface 54 which is generally parallel to the friction surface 52. The wear plate 42 includes one or more apertures 56 which may be conical or countersunk. The wear plate 42 is preferably formed from cast iron which has a kinetic coefficient of friction with steel or acicular iron of approximately 0.15.

[0017] The wear member 40 also includes a backing member 60 which may be attached to the rear surface 54 of the wear plate 42 by an adhesive or the like. The backing member 60 extends generally coextensively with the rear surface 54. The backing member 60 is preferably formed from a sheet of polytetrafluoroethylene (PTFE) that is approximately one millimeter thick. The backing member 60 includes an exterior surface 62 and one or more apertures 64 which are respectively aligned with the apertures 56 in the wear plate 42. The backing member 60 is adapted to be placed adjacent the inclined face 32 or 34 of the pedestal 24 to accommodate any surface irregularities in the cast surface of the inclined faces 32 and 34 thereby providing a good mating fit between the rear surface 54 of the wear plates 42 and the inclined faces 32 and 34. The backing member 60 reduces or dampens any noise that may otherwise be produced between the fit of the wear plate 42 with the pedestal 24.

[0018] Forming the wear plate 42 from cast iron which has a kinetic coefficient of friction with the steel or acicular iron of the friction wedge 39 of approximately 0.15, as opposed to forming the wear plate 42 from steel which has a kinetic coefficient of friction with the steel or acicular iron of the friction wedge 39 of approximately 0.30, promotes generation of a lower axle centering force. Axle centering forces act horizontally toward the center of the axle at curves in the railroad track and are generated by surface forces between the friction wedge 39 and the wear member 40. When the axle centering force can be decreased, the forces generated at the wheel/rail interface that are needed to move the axle are also lower and self-steering of the wheel is promoted. Lower self-steering forces are particularly required at laden. High resistance to self-steering can be caused by use of steel wear plates. In addition, wear plate 42 from cast iron has a better damping capacity than a steel wear plate, making the suspension less prone to generating noise.

[0019] The saddle 35 ofthe railcar truck 20 as best shown in Figure 4 extends between a first end 70 and a second end 72. The saddle 35 includes a center post 74 having a generally horizontal roof 76, a first side wall 78 that extends downwardly from the roof 76 to a bottom end 80, and a second side wall 82 that extends downwardly from the roof 76 to a bottom end 84. The second side wall 82 is spaced apart from the first side wall 78 and a cavity 86 is formed therebetween. A horizontal first shelf 88 extends outwardly from the bottom end 80 of the first side wall 78 to the first end 70 of the saddle 35. A horizontal second shelf 90 extends outwardly from the bottom end 84 to the second end 72 of the saddle 35. Each shelf 88 and 90 is adapted to engage and support the bottom end of a spring 36 as shown in Figure 1. The roof 76 includes a roof cavity 92 that is in communication with the cavity 86.

[0020] As best shown in Figures 4, 6 and 7, the bottom end 80 of the first side wall 78 includes a pocket 94 and the bottom end 84 of the second side wall 82 includes a pocket 95. Each pocket 94 and 95 includes a vertical and generally planar rear wall 96, a horizontal and generally planar top wall 98, a vertical generally planar first side wall 100, and a vertical and generally planar second side wall 102. The first side wall 100 is spaced apart from and is generally parallel to the second side wall 102. The pockets 94 and 95 are in communication with the cavity 86. Each pocket 94 and 95 is open at its bottom end that opposes ita top wall 98. The first pocket 94 forms a pair of opposing wing members 104 at the bottom end 80 of the first side wall 78 on each side of the pocket 94. The second pocket 95 forms a pair of opposing wing members 106 on each side of the pocket 95 at the bottom end 84 of the second side wall 82. A threaded

bore 108 extends vertically upwardly through the top wall 98 of the pocket 94 into the first side wall 78. A threaded bore 110 extends vertically upwardly through the top wall 98 of the pocket 95 into the second side wall 82.

[0021] The saddle 35 includes a selectively removable link member 120. The link member 120 extends generally linearly between a first end 122 and a second end 124. The first end 122 includes an aperture 126 and the second end 124 includes an aperture 127. The first end 122, as best shown in Figure 6, includes a generally vertical and planar end wall 128 which is adapted to engage the rear wall 96 of the first pocket 94 of the first side wall 78. The first end 122 of the link member 120 also includes a generally horizontal and planar top wall 130 that is adapted to engage the top wall 98 of the first pocket 94 of the first side wall 78. The second end 124 of the link member 120, as best shown in Figure 4, includes a vertical and generally planar end wall 132 that is adapted to engage the rear wall 96 of the second pocket 95 of the second side wall 82. The second end 124 of the link member 120 also includes a horizontal and generally planar top wall 134 which is adapted to engage the top wall 98 of the second pocket 95. As best shown in Figure 7, the center portion of the link member 120 is generally I-shaped.

[0022] The first end 122 of the link member 120 is inserted into the first pocket 94 of the first side wall 78 of the saddle 35 such that the end wall 128 engages the rear wall 96 of the first pocket 94, and such that the vertical aperture 126 is aligned with the aperture 108 in the top wall 98 of the pocket 94. A fastener 136 such as a bolt is inserted through the first end 122 of the link member 120 into the saddle bore 108 of the top wall 98. The second end 124 of the link member 120 is inserted into the second pocket 95 of the second side wall 82 of the saddle 35 such that the end wall 132 engages the rear wall 96 of the second pocket 95. The vertical aperture 127 at the second end 124 of the link member 120 is aligned with the bore 110 in the top wall 98 of the second pocket 95 and a fastener 138 is placed therethrough

[0023] The length of the link member 120 between the end walls 128 and 132 is such that the link member 120 will closely fit between and mate with the rear walls 96 of the first pocket 94 and second pocket 95 due to use of an interference fit. The link member 120 is placed in compression during operation by the loads that are applied from the springs 36 to the shelves 88 and 90 of the saddle 35. The fasteners 136 and 138 do not act to transfer any shear load or shear force between the link member 120 and the first and second side walls 78 and 82 of the saddle 35. The loads from the first and second side walls 78 and 82 are transferred to the link member 120 by engagement with the end walls 128 and 132 of the link member 120. The fasteners 136 and 138 are tightened in order to apply a compression frustrum between the end of the link member 120 and the top walls 98 of the pockets 94 and 95 of the saddle 35. Hence the link member 120 is held in contact with the saddle pockets at all times on walls 96 and 98 of pockets 94 and 95 of saddle 35.

[0024] The link member 120 facilitates easy maintenance of the railcar truck 20. In order to remove the saddle 35 from the wheel set, the fasteners 136 and 138 are removed, and then the link member 120 is removed from the saddle 35. This is done by use of an expansion tool acting between the side walls 78 and 82, such that the pocket rear walls 96 are moved apart in order to negate the interference fit of the ends of the link member 120 over walls 128 and 132. Once the link member 120 is removed, the saddle 35, springs 36, and side frame 22 may then be lifted upwardly away from the wheel set to enable the performance of maintenance. The saddle 35, springs 36, and side frame 22 are held together during lifting by retaining studs 142.

[0025] As shown in Figure 1, the saddle 35 is supported on the bearing 37 and axle 38 of the wheel set by a rocker member 150. The rocker member 150 includes a top wall 152 which is generally planar and which is adapted to be inserted into the roof cavity 92 of the roof 76 of the saddle 35. The rocker member 150 also includes a bottom wall 154 which is adapted to engage the bearing 37. The rocker member 150 includes a plurality of threaded bores which extend into the rocker member 150 through the top wall 152. A backing member 158 is placed between the rocker member 150 and the roof 76 of the saddle 35 within the roof cavity 92 to accommodate any cast or forged surface irregularities in the surface of the roof 76. The backing member 158 is preferably a sheet of PTFE approximately one millimeter thick. The backing member 158 also reduces or dampens noise which may otherwise be created between the rocker member 150 and the saddle 35. The rocker member 150 is removably attached to the roof 76 of the saddle 35 by a plurality of threaded fasteners 160 which extend through apertures in the roof 76 and which threadably engage the bores 156 in the rocker member 150.

[0026] The mechanical attachment of the rocker member 150 to the roof 76 of the saddle 35 by the fasteners 160 enables the rocker member 150 to be easily and quickly replaced if the rocker member becomes worn or damaged. In addition, as shown in Figure 4, the mechanical attachment of the rocker member 150 to the roof 76 also enables, when desired, a shim 162 to be placed between the top wall 152 of the rocker member 150 and the backing member 158 that is located within the roof cavity 92 of the roof 76. The shim 162 includes a plurality of apertures through which the fasteners 160 may extend from the roof 76 into the bores 156 of the rocker member 150. The shim 162 includes a top wall 164 that is adapted to engage the backing member 158 and a bottom wall 166 that is adapted to engage the top wall 152 of the rocker member 150. The shim 162 may have a thickness of up to approximately eighteen to twenty millimeters between the top wall 164 and the bot-

tom wall 166. The ability to place a shim 162 of a desired thickness between the rocker member 150 and the backing member 158 In the roof 76 enables the saddle 35 and its adjoining parts to be height adjusted to accommodate excessive wheel wear and spring vertical movement that otherwise would cause the car body buffer centers go out of gauge tolerance.

[0027] Various features ofthe invention have been particularly shown and described in connection with the illustrated embodiments of the invention, however, it must be understood that these particular arrangements merely illustrate, and that the invention is to be given its fullest interpretation within the terms of the appended claims.

Claims

1. A saddle for a railcar truck adapted to receive a bearing, said saddle including:

a roof having a roof cavity;
a first side wall extending downwardly from said roof,
a second side wall extending downwardly from said roof, said second side wall spaced apart from said first side wall such that the bearing is adapted to be located between said first side wall and said second side wall;
a rocker member having a top wall and a bottom wall, said top wall adapted to be inserted into said roof cavity of said roof, said bottom wall adapted to engage the bearing; and
a fastener adapted to removably attach said rocker member to said roof;
whereby said rocker member is selectively removable from said roof for maintenance.

2. The saddle of claim 1 wherein said roof includes an aperture and said rocker member includes a bore extending through said top wall into said rocker member, said fastener adapted to extend through said aperture into said bore.

3. The saddle of claim 1 including a shim located in said roof cavity between said top wall of said rocker member and said roof

4. The saddle of claim 3 wherein said shim includes a top wall, a bottom wall and en aperture extending through said shim from said top wall to said bottom wall of said shim, said roof includes an aperture, and said rocker member includes a bore extending into said rocker member through said top wall of said rocker member, said fastener adapted to extend through said aperture in said roof and said aperture in said shim into said bore of said rocker member

5. The saddle of claim 1 including a backing member located between said top wall of said rocker member and said roof.

6. The saddle of claim 5 wherein said backing member comprises a sheet of polytetrafluoroethylene.

7. A saddle for a railcar truck adapted to receive a bearing, said saddle including:

a roof;
a first side wall extending downwardly from said roof, said first side wall including a first end spaced apart from said roof;
a second side wall extending downwardly from said roof, said second side wall being spaced apart from said first side wall such that the bearing is adapted to be located between said first side wall and said second side wall, said second side wall including a second end spaced apart from said roof; and
a link member extending between said first side wall and said second side wall, said link member including a first end adapted to engage said first end of said first side wall and a second end adapted to engage said second end of said second side wall, said link member being selectively removable from said first side wall and said second side wall.

8. The saddle of claim 7 wherein said first end of said first side wall includes a first pocket adapted to receive said first end of said link member, and said first end of said second side wall includes a second pocket adapted to receive said second end of said link member.

9. The saddle of claim 8 wherein said first pocket includes a rear wall and said second pocket includes a rear wall, said first end of said link member adapted to engage said rear wall of said first pocket and said second end of said link member adapted to engage said rear wall of said second pocket.

10. The saddle of claim 8 wherein said first pocket includes a top wall and said second pocket includes a top wall, said first end of said link member adapted to engage said top wall of said first pocket and said second end of said link member adapted to engage said top wall of said second pocket.

11. The saddle of claim 10 wherein said top wall of said first pocket includes a first bore and said top wall of said second pocket includes a second bore, said first end of said link member includes a first aperture, and said second end of said link member includes a second aperture, said first bore and said first aperture adapted to receive a first fastener for

removably attaching said first end of said link member to said first end of said first side wall, and said second bore and said second aperture adapted to receive a second fastener for removably attaching said second end of said link member to said second end of said second side wall.

12. The saddle of claim 8 wherein said first end of said first side wall includes a first wing member and a second wing member, said first pocket being located between said first and second wing members, and said second end of said second side wall includes a third wing member and a fourth wing member, said second pocket being located between said third and fourth wing members.

13. A pedestal of a side frame for a railcar truck having a first friction wedge and a second friction wedge, said pedestal including:

a first pedestal jaw including a first interior face;
a second pedestal jaw including a second interior face;
a first wear member attached to said first face of said first pedestal jaw, said first wear member having a front friction surface adapted to engage the first friction wedge, said first wear member being formed from a material having a kinetic coefficient of friction with steel or acicular iron of approximately 0.15; and
a second wear member attached to said second face of said second pedestal jaw, said second wear member having a front friction surface adapted to engage the second friction wedge, said second wear member being formed from a material having a kinetic coefficient of friction with steel or acicular iron of approximately 0.15.

14. The pedestal jaw of claim 13 wherein said material having a kinetic coefficient of friction with steel or acicular iron of approximately 0.15 comprises cast iron.

15. The pedestal jaw of claim 13 including a backing member located between said first wear member and said first face of said first pedestal jaw.

16. The pedestal jaw of claim 15 wherein said backing member comprises a sheet of polytetrafluoroethylene.

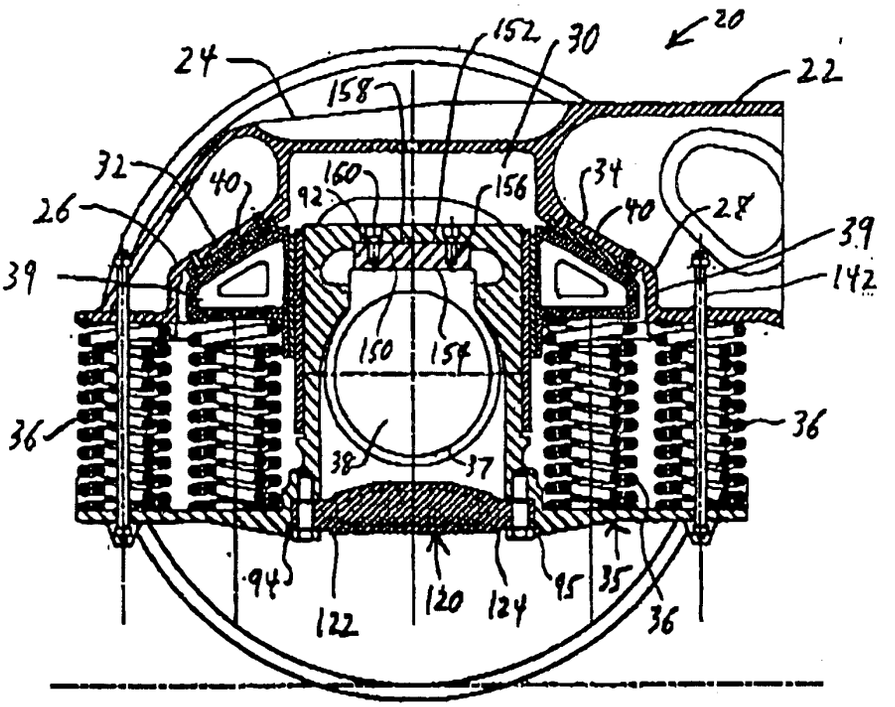

FIG. 1

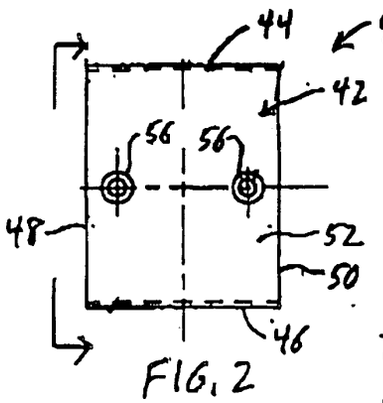

FIG. 2

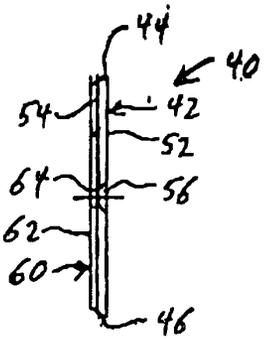

FIG. 3

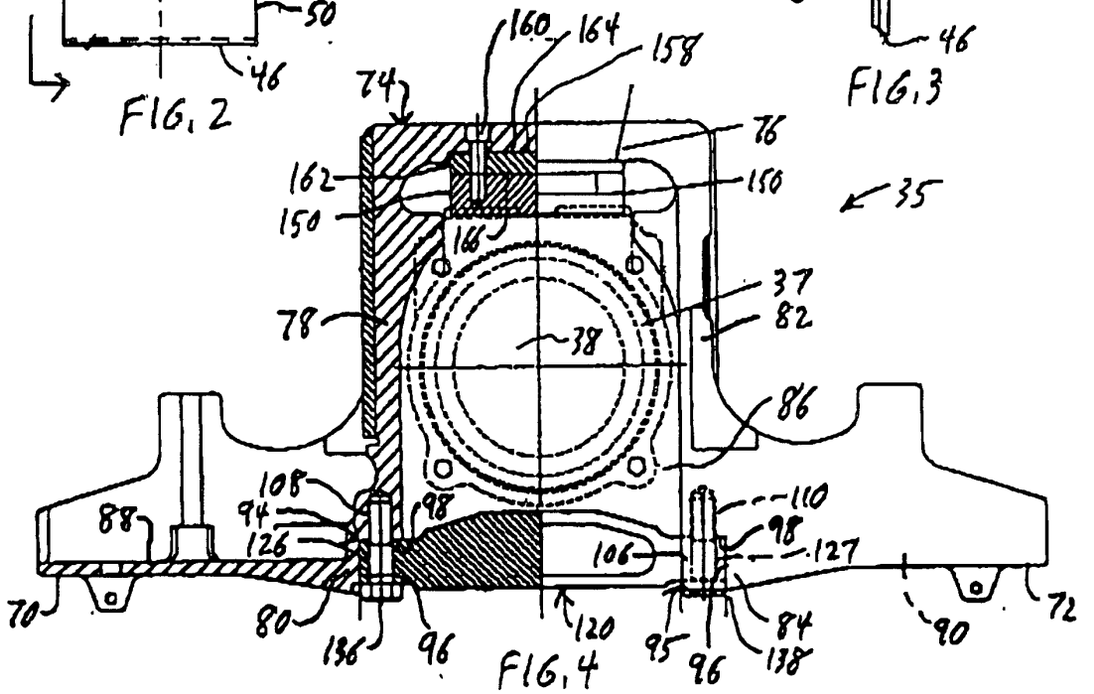

FIG. 4

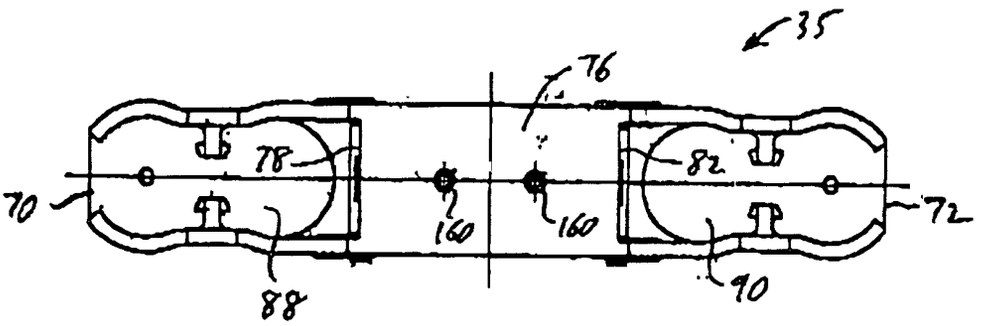

FIG. 5

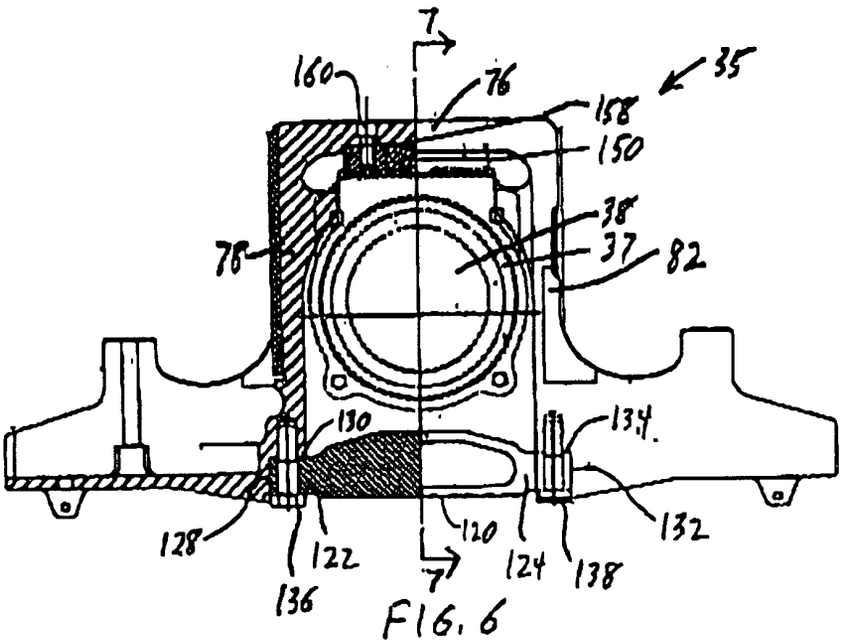

FIG. 6

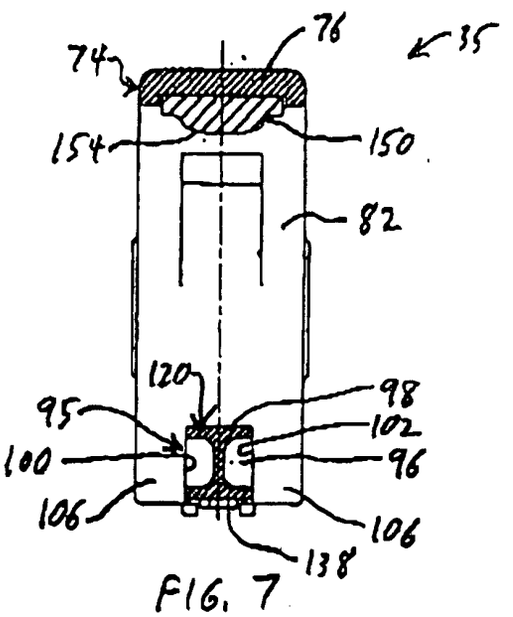

FIG. 7