United States Patent [19]

Kolb et al.

[11] **3,812,980**

[45] **May 28, 1974**

[54] **VALVE MEANS FOR RAILWAY CAR TRAINLINE**

[75] Inventors: **John P. Kolb**, Stafford; **Richard G. Powell**, Houston, both of Tex.

[73] Assignee: **ACF Industries Incorporated**, New York, N.Y.

[22] Filed: **June 1, 1973**

[21] Appl. No.: **365,887**

[52] **U.S. Cl.** **213/76**, 137/349, 248/67, 251/289, 285/63

[51] **Int. Cl.** **B61g 5/06**

[58] **Field of Search** ..... 213/1 R, 1.3, 76; 137/349; 251/236, 238, 243, 249, 287, 288, 289; 248/67; 285/63

[56] **References Cited**

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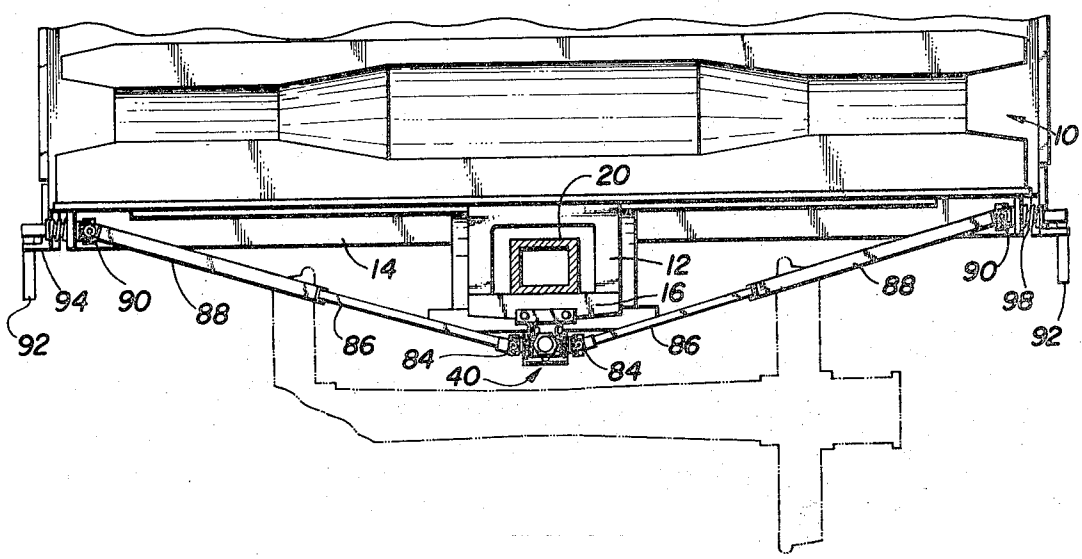
Assistant Examiner—Gene A. Church
Attorney, Agent, or Firm—Eugene N. Riddle

[57] **ABSTRACT**

A trainline for a railway car has a ball valve structure adjacent the end of the car movable between open and closed positions for controlling the flow of air through the trainline. A ball valve element is mounted within the body of the ball valve structure and is freely floating therein for maintaining a tight seal against the downstream seat when the valve is in closed position. Opposed stems for rotating the ball valve element are mounted on opposed sides of the valve body and extend from the valve body in a generally horizontal direction. An actuating rod is connected to each stem and extends to the adjacent side of the railway car so that the valve may be actuated from either side of the railway car. Actuation of one rod effects simultaneous actuation of the other rod.

6 Claims, 11 Drawing Figures



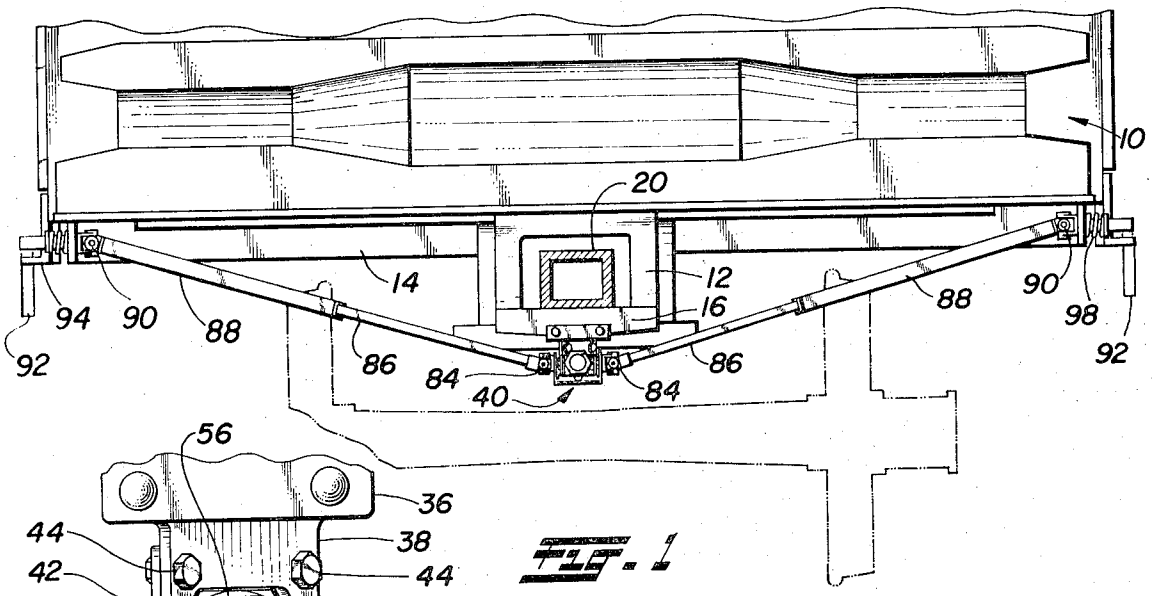


FIG. 1

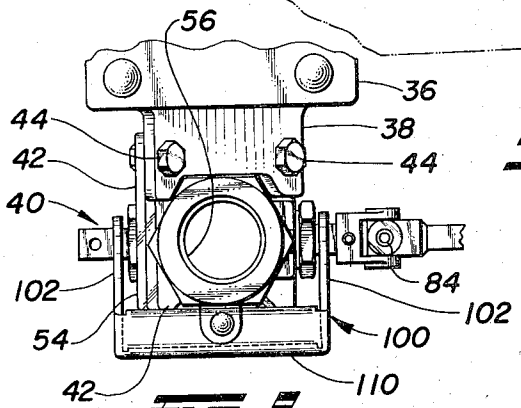


FIG. 4

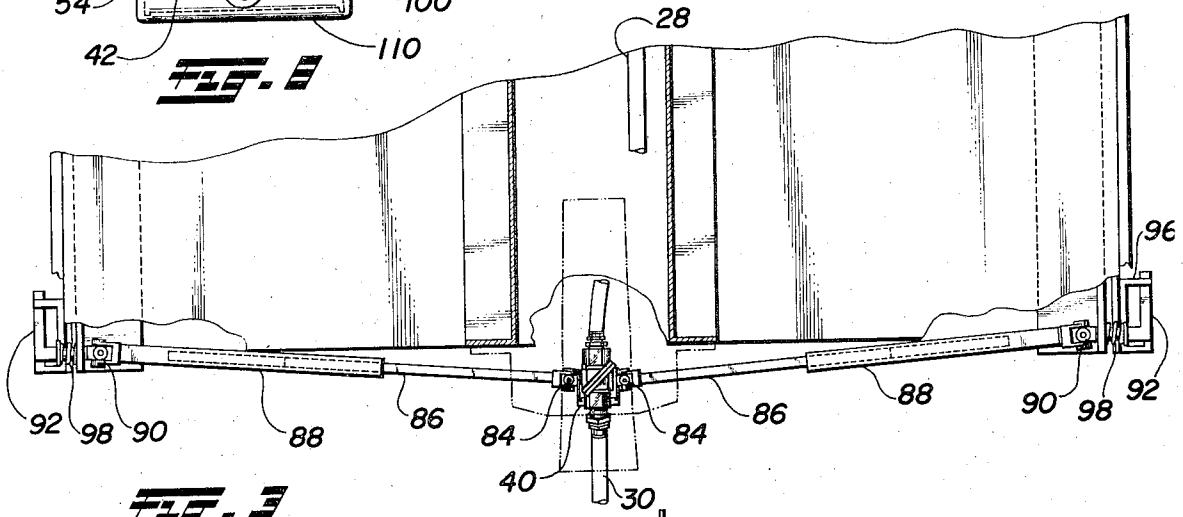


FIG. 3

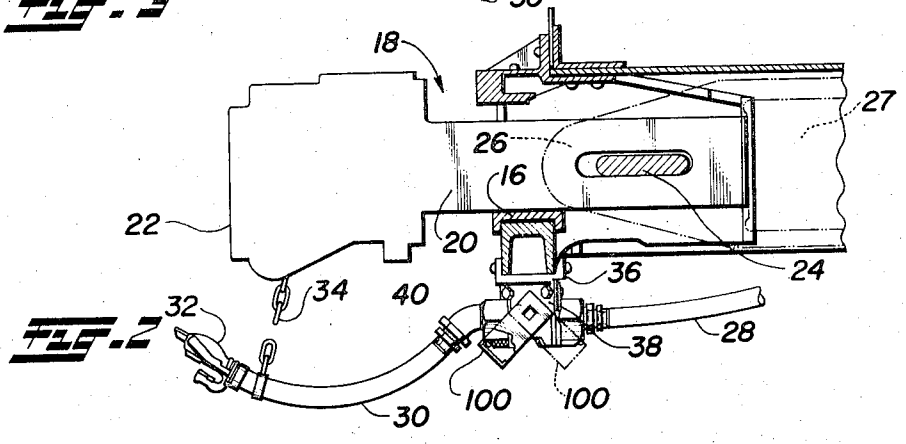


FIG. 2

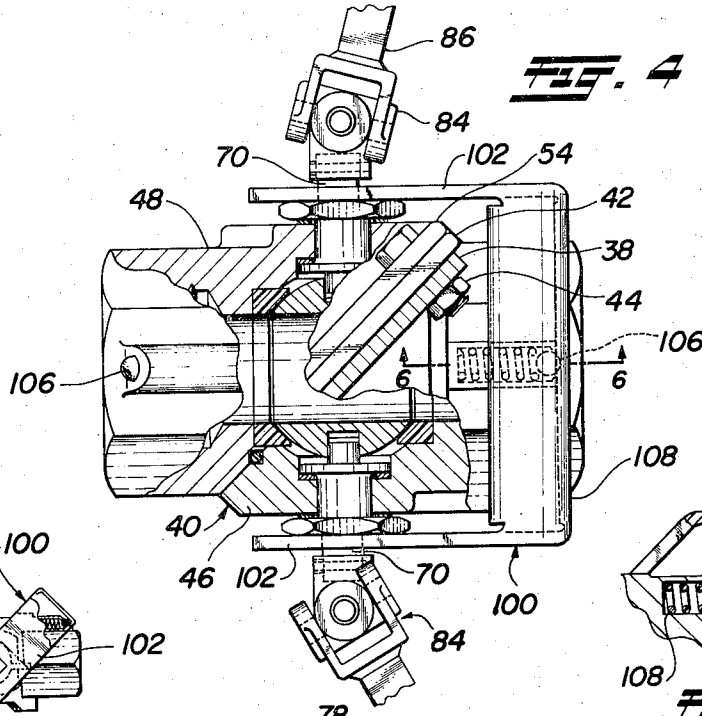


FIG. 4

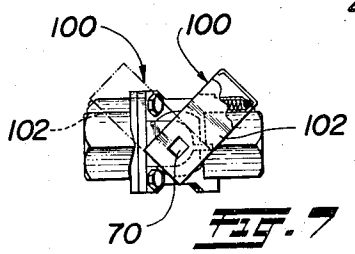


FIG. 7

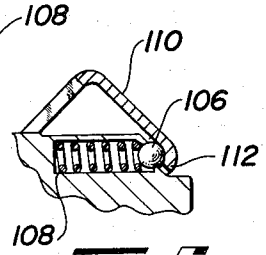


FIG. 6

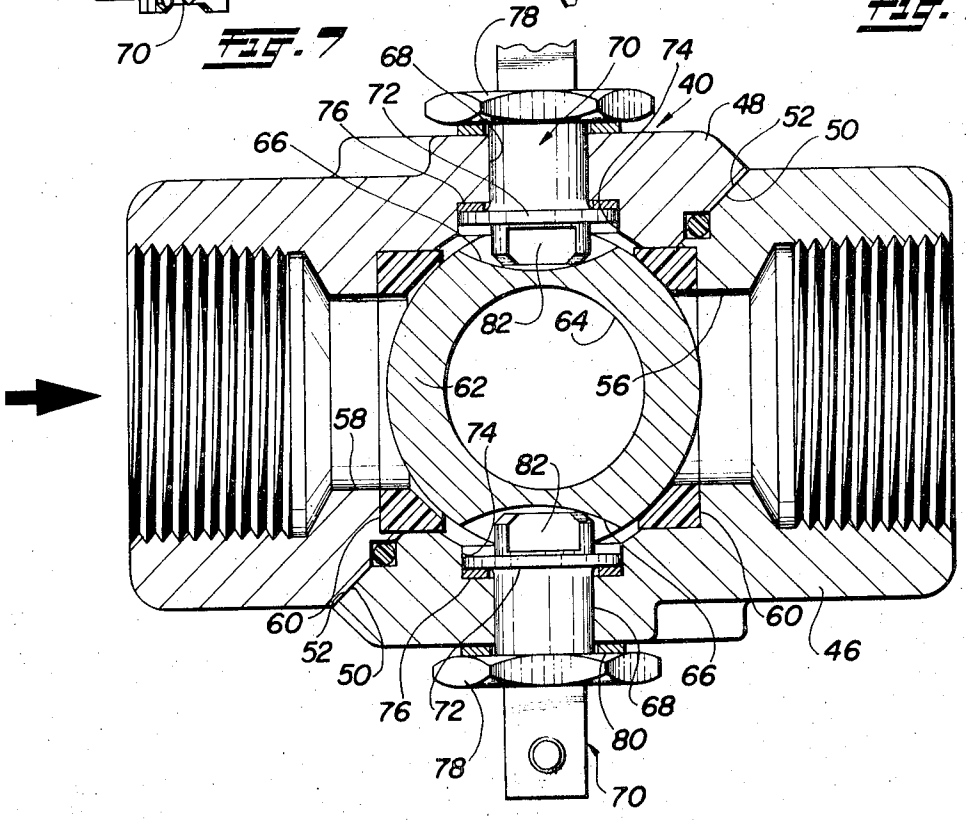


FIG. 5

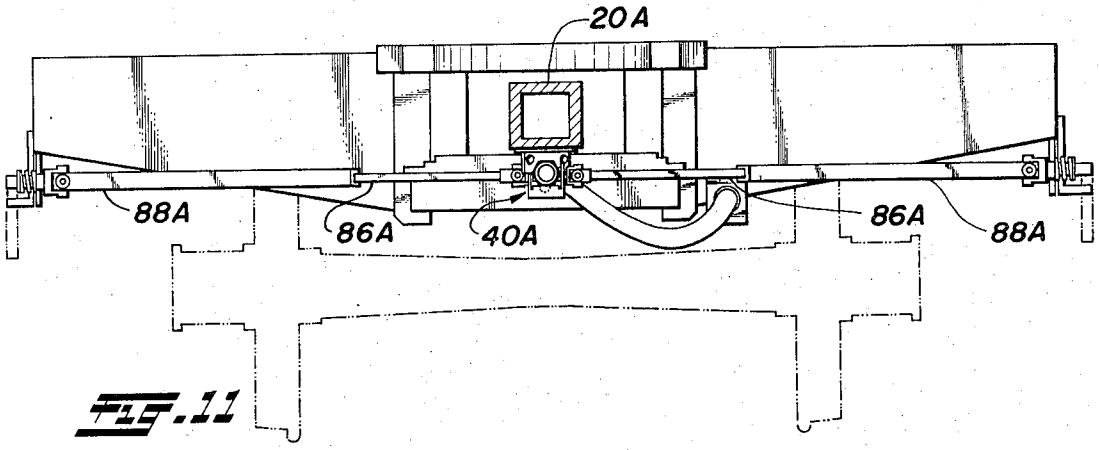


FIG. 11

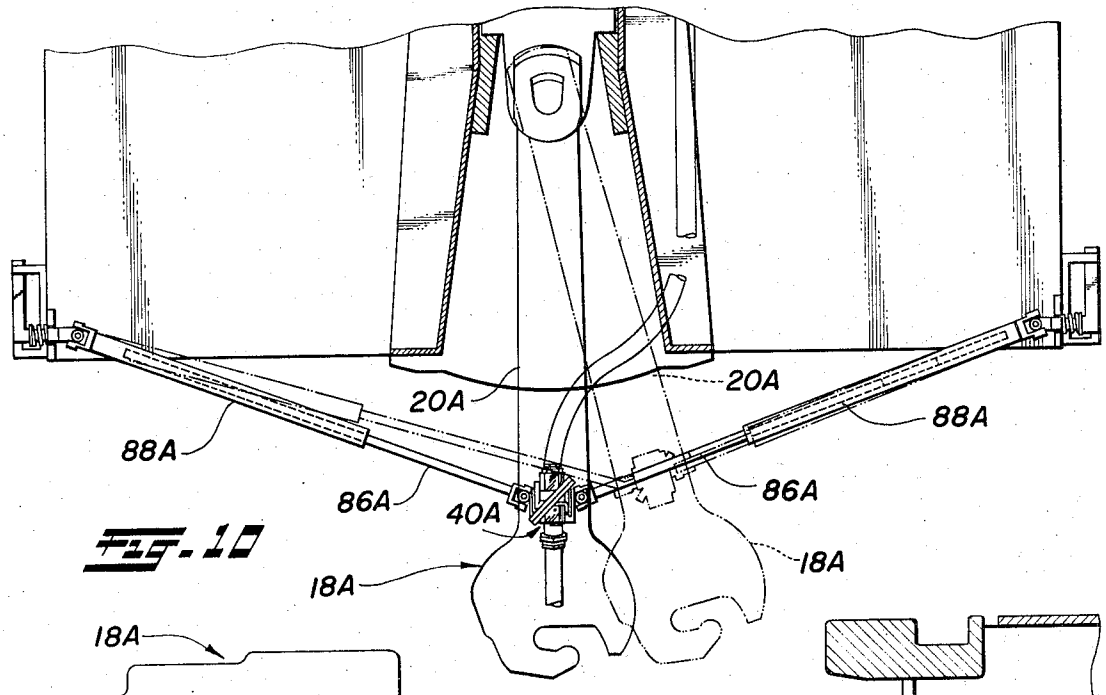


FIG. 10

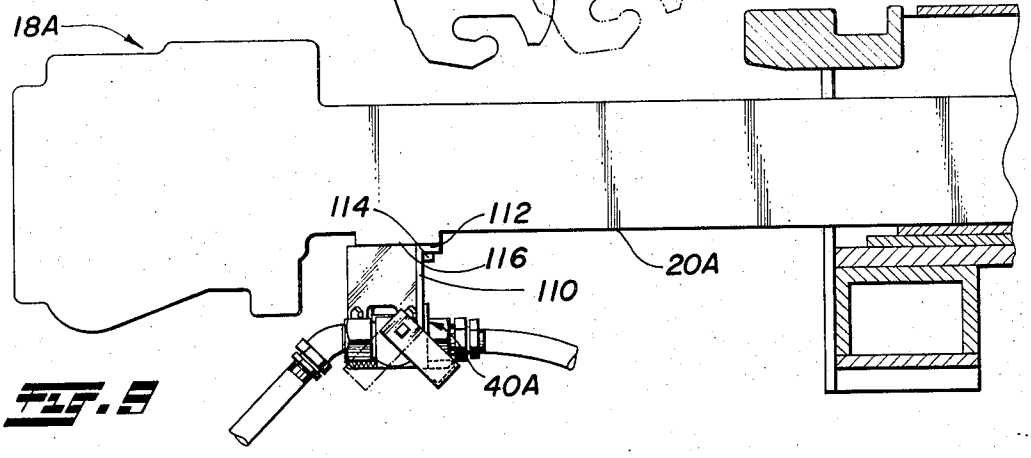


FIG. 9

VALVE MEANS FOR RAILWAY CAR TRAINLINE

BACKGROUND OF THE INVENTION

Heretofore, valves mounted adjacent the end of the trainline have been provided for controlling flow of air therethrough. For example, Mitchell U.S. Pat. No. 1,240,472 shows a valve member in a trainline including a rotating plug in which the valve member may be actuated manually from either side of the car by rotation of a rod member connected to a stem of the plug member. The stems of the valve structure of Mitchell are fixed to the rotating plug member and no relative movement is permitted between the plug members and the stems.

DESCRIPTION OF THE PRESENT INVENTION

The trainline has a ball valve structure adjacent the end of the car in which a ball valve element is mounted for rotation between open and closed positions. The ball valve member is freely floating within the body of the valve and has opposed slots on opposite sides thereof. Stems extending through the valve body fit loosely in the slots so that the valve ball member may move relative to the stems. Thus, upon the closing of the ball valve member, pressure resulting from air within the trainline urges the ball valve element tightly against the downstream seat so that an effective seating and sealing is provided by the ball valve element.

Actuating means are provided to actuate the valve from either side of the car and comprise a universal connection on the extending end of each stem of the ball valve. Telescoping rod members extend from the universal connection of each stem to the adjacent ends of the car whereby the valve may may be actuated from either side of the car.

The present invention is adapted for use with railway cars having conventional draft gear, and also for railway cars having so-called end of car cushioning in which the coupler shank may move inwardly as much as 15 inches. The valve structure may be connected or secured beneath the coupler carrier and this is particularly useful when conventional draft gear is employed. In the event a long travel cushion device is employed with the coupler moving as much as 15 inches, it is desirable to mount the valve member beneath the coupler shank. An embodiment showing the actuating means and valve structure for a railway car employing a long travel end of car cushioning device is disclosed in which the valve structure is connected to the shank of the coupler. Means are provided to releasably hold the valve in open and closed positions so as to withstand shock and jars to which the railway car is normally subjected.

In the accompanying drawings, in which two of various possible embodiments of the invention are illustrated,

FIG. 1 is a partial end elevation of a railway car illustrating an embodiment of the valve structure which is secured to the coupler carrier beneath the coupler;

FIG. 2 is a transverse section of the valve structure illustrated in FIG. 1 and showing means mounting the valve structure to the coupler carrier;

FIG. 3 is a partial top plan view showing the valve structure and actuating means therefor;

FIG. 4 is a sectional view of means for releasably holding the valve member in open and closed positions, certain parts being shown in elevation;

FIG. 5 is a longitudinal sectional view of the valve structure shown in FIGS. 1–4;

FIG. 6 is an enlarged view taken generally along line 6—6 of FIG. 4;

FIG. 7 is a partial end elevation illustrating the movement of the releasable means for holding the ball valve element in the open and closed positions thereof;

FIG. 8 is an elevational view illustrating the specific means for mounting the valve structure beneath the coupler carrier;

FIG. 9 is a side elevation of another embodiment of the valve structure employed with a long travel cushion device and showing the valve structure mounted beneath the coupler shank;

FIG. 10 is a top plan illustrating the valve structure shown in FIG. 9;

FIG. 11 is an end elevation of the valve structure shown in FIG. 9.

Referring now to the drawings for a better understanding of the invention and more particularly to the embodiment shown in FIGS. 1–8, a railway car is generally indicated 10 having a longitudinally extending center sill 12. An end sill 14 extends between the sides of the railway car. A coupler carrier 16 extends between the sides of center sill 12. A coupler generally designated 18 has a coupler shank 20 supported on coupler carrier 16 and a coupler head 22 which is adapted to be connected to an adjacent car. A key 24 connects coupler shank 20 to a yoke 26 of a conventional draft gear indicated generally at 27.

A trainline 28 extends the length of the car and has a flexible hose 30 at its end with a gladhand 32 which is adapted to be connected to a complementary gladhand on an adjacent railway car. A chain 34 supports flexible hose 30 from coupler head 22. Secured to coupler carrier 16 is a bracket 36 having a downwardly extending plate 38 thereon as shown particularly in FIG. 8. The valve structure generally indicated 40 has an upstanding flange 42 which laps plate 38 and is secured thereto by suitable nut and bolt combinations 44. Valve structure 40 is formed of two body portions 46 and 48 having respective mating faces 50 and 52 inclined at 45° with respect to the longitudinal axis of valve structure 40. Flange 42 is secured to body portion 46 and laps plate 38 as mentioned above. Flange 54 of body portion 48 terminates below plate 38. A fluid passageway 56 is provided in body portion 46 and a fluid passageway 58 is provided in body portion 48. A valve chamber is formed by body portions 46 and 48 and annular valve seats 60 are mounted on opposed sides of the valve chamber. Mounted within the valve chamber is a ball valve element 62 having a fluid passageway 64 therethrough adapted for alignment with passageways 56 and 58 when in open position. Ball valve element 62 has elongated slots 66 formed on opposed sides of ball valve element 62. A stem bore 68 is provided in each body portion 46, 48 and a stem indicated generally at 70 is mounted within each bore 68. It is to be understood that each valve stem 70 is identical and only one is described in detail for purpose of illustration only.

Each stem 70 has an enlarged flange 72 mounted within an enlarged bore 74 and having an annular sealing member 76 adjacent flange 72. A nut 78 is threaded onto the outer end portion of stem 70 and has a resil-

ient seal **80** between nut **78** and the adjacent valve body whereby upon tightening of nut **78**, flange **72** is drawn tight against seal **76**. Each stem **70** has an inner extending tongue **82** which fits within the associated elongated slot **66** for rotation of valve ball element **62** upon rotation of either stem **70**. It is apparent that valve element **62** freely floating and is not fixed within the valve chamber. Thus, as shown in FIG. **5** in the closed position, air pressure against the adjacent face of ball valve element **62** will urge ball valve element **62** tightly into engagement with the downstream seat **60** with ball valve element **62** moving relative to stems **70**.

For rotation of valve ball element **62** between open and closed positions, and referring particularly to FIGS. **1, 4** and **8**, a universal type connection generally indicated **84** is connected to each stem **70**. Rod **88** is hollow and has a generally rectangular cross section to receive rod **86** in sliding relative relation. A universal connection **90** is secured to an end of rod **88** and a manually operated handle **92** is connected to universal connection **90**. In the position of FIG. **1**, handle **92** is shown in a down position engaging a stop **94** on the side of a railway car. In the position shown in FIG. **3**, handle **92** is shown in a generally horizontal position and engaging stop **96**. A compression spring **98** extends about handle **92** and continuously urges handle **92** outwardly to remove any excess slack. In the position of FIG. **1**, valve element **62** is in a closed position and in the position of FIG. **3**, valve element **62** is in an open position.

Referring particularly to FIGS. **4, 6** and **7**, a structure is illustrated which releasably holds valve element **62** in open and closed positions. A bail structure generally indicated **100** has arms **102** with openings of a rectangular dimension receiving stems **70**. Ball detents **106** project outwardly from the valve body and are spring urged by springs **108** outwardly of the adjacent surface of the valve body. Extending between arms **102** is bail **110** having an inturned edge portion **112** adapted to engage ball **106** as shown specifically in FIG. **6** thereby to releasably hold valve element **62** in open and closed positions. A railway car has shocks and jars exerted against it and it is necessary that valve element **62** withstand the shocks and jars to which the railway car is subjected. The rotational force applied by handles **92** is adequate to permit riding of inturned edge portion **112** over the ball **106** to permit ball valve element **62** to rotate. Inturned edge portion **112** will likewise ride over the surface of ball **106** and spring **108** will then urge ball **106** against the inner surface of inturned edge portion **112** as shown in FIG. **6**.

Referring now to the embodiment of FIGS. **9–11** in which the present invention is adapted for use with a so-called long travel cushion unit, coupler **18A** has a relatively long shank **20A** which is suitably connected to an end of car cushion unit (not shown) which may have a travel of around 15 inches, for example. In this embodiment, valve structure indicated generally at **40A** has an upstanding plate or flange **110** thereon with an upper flange **112**. Upper flange **112** is bolted at **114** to a pad **116** welded or secured to the underside of coupler shank **20A**. Thus, valve structure **40A** moves with coupler **18A** upon swinging movement thereof and upon any longitudinal cushioned movement of coupler **18A**. The actuating means for valve structure **40A** includes telescoping rods **86A, 88A** identical to that shown in the embodiments of FIGS. **1–8**.

What is claimed is:

1. In a railway car having an underframe including a center sill structure with an open outer end, a coupler having a shank extending within the open outer end, a trainline extending the length of the car and including an end portion beneath the coupler shank, a valve structure mounted within the trainline beneath the coupler shank for controlling the flow of air through the trainline, said valve structure including a valve body, a freely floating spherical ball valve member within said body and having opposed grooves on opposite sides of the ball valve member, a separate valve stem extending through the valve body and fitting within each of said grooves for moving the ball valve member between open and closed positions, said valve stems having longitudinal axes extending perpendicularly to the longitudinal axis of the coupler shank, and manual actuating means connected to each valve stem and extending to the adjacent side of the railway car whereby the ball valve member may be moved between open and closed positions from either side of the railway car.

2. In a railway car as set forth in claim **1** said manual actuating means includes a handle adjacent each side of the railway car, rod means extending between each handle and an adjacent valve stem, and universal type connections between the handle and rod members and between the valve stems and rod members thereby to rotate the stems upon actuation of said manual actuating means.

3. In a railway car as set forth in claim **1**, said manual actuating means includes a handle adjacent each side of the railway car, and stops to contact the handles at the open and closed positions of the valve member.

4. In a railway car as set forth in claim **1**, means at the open and closed positions of the ball valve member to releasably hold the ball valve member in said positions.

5. In a railway car as set forth in claim **4**, said means at the open and closed positions of the ball valve member including a ball structure having a pair of parallel arms connected to the valve stems for rotative movement therewith and a ball member connecting the arms and extending across the valve body, and a releasable catch engaging the ball member at the open and closed positions of the ball valve member to releasably hold the ball valve member in said positions.

6. In a railway car as set forth in claim **1**, said manual actuating means includes a handle adjacent each side of the railway car, stops to contact the handles at the open and closed positions of the valve member, and spring means to urge the handles outwardly of the car to remove any slack.

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