

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

0 680 864 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **94113994.1**(51) Int. Cl.⁶: **B61G 5/02**(22) Date of filing: **07.09.94**(30) Priority: **04.05.94 US 238264**(43) Date of publication of application:
08.11.95 Bulletin 95/45(84) Designated Contracting States:
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S-203 13 Malmö (SE)**(54) **A female connection member for a slackless drawbar assembly using a ball and race assembly.**

(57) A female connection member (10) for use in a slackless drawbar assembly (20) is engaging one end of a railway car. A cavity (14) is formed in an outer end of such female member (10). First and second openings (30,36) are formed through respective ones of a pair of side wall portions (26,28) of such cavity (14). Such cavity is adapted to receive a portion of a first end of a male connection member (40) therein. An aperture (44) is formed through such first end of the male member (40) to receive a portion of a ball member (46) therein. A pair of shaft members (48,50) extends from the outer surfaces of

such ball member (46). A portion of one of the pair of shafts is adapted to be disposed in the first opening (30) and a portion of another one is adapted to be disposed in the second opening (36). Such pair of shafts have opposed flat surface portions (52,54). A race assembly (56) is disposed in such aperture and secured to the male member. An inner surface of such race (56) surrounds such ball (46). Respective ones of a pair of wedges (70) engage respective flat surfaces (52,54) on such pair of shaft members (48,50).

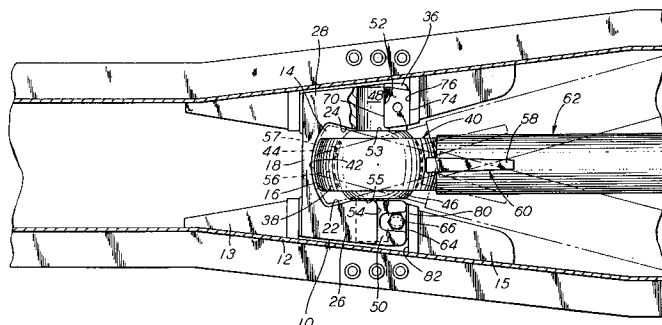


FIG. 1

CROSS-REFERENCE TO RELATED APPLICATIONS

This patent application is related to a patent application titled, "Slackless Drawbar Assembly Using A Ball And Race Assembly At Each End Of The Drawbar" and another patent application titled, "A Male Connection Member For A Slackless Drawbar Assembly Using A Ball And Race Assembly", both of these applications are being filed concurrently herewith and are, also, assigned to the assignee of the present invention.

FIELD OF THE INVENTION

The present invention relates, in general, to slackless type drawbar assemblies which are in extensive use at the present time in the railway industry to couple together the adjacently disposed ends of a pair of railway freight type cars in a substantially semi-permanent fashion and, more particularly, this invention relates to a female connection member which can be used in an improved slackless type drawbar assembly which is specifically designed to make use of a ball and race assembly disposed substantially adjacent each end of such drawbar assembly to achieve the requisite amount of angling movements which are necessary between such pair of railway freight cars during their operation on a track structure and, still more specifically, the female connection member of the present invention can, also, be used in conjunction with a male connection member for a slackless drawbar assembly using a ball and race assembly to replace one end of a prior art type slackless drawbar assembly during a routine repair of such prior art slackless drawbar assembly thereby enabling a cost effective replacement of a prior art type slackless drawbar assembly in stages.

BACKGROUND OF THE INVENTION

Prior to the development of the present invention, as is generally quite well known in the railroad industry, a number of slackless type drawbar assemblies have been in widespread use for several years. These slackless drawbar assemblies are designed to couple together the adjacently disposed ends of a pair of railway freight cars in a substantially semi-permanent fashion.

In other words, these railway cars do not require frequent separation during service. Normally they will only be separated during a required repair and/or routine maintenance being performed on one or more of them.

These railway freight cars are normally of the type which are utilized in the railroad industry in what is most commonly referred to as dedicated

service. These dedicated service type railway freight cars will generally include; by way of example only, cars which are utilized to haul coal, coke, and/or various other types of minerals, light truck and automobile transport carriers, tank cars used for the purpose of transporting various types of liquids, as well as, cars which are quite often used in transporting various types of building materials.

Examples of several common minerals which are normally transported in these dedicated service type railway cars will include; various ores, cement, slag and stone. The various types of liquids which are known by applicants to be transported by such dedicated service type railway freight cars will at least include a number of different chemicals, including liquified gases.

In some of the most frequently used applications, which are presently known to applicants, there will be at least about five such railway freight cars connected together which utilize these slackless type drawbar assemblies. However, it is, likewise, known that as many as ten such railway freight cars have been connected together in this manner. Railway freight cars which have been semi-permanently connected together, in this particular fashion, are most commonly referred to in the railroad industry as five (5) packs and/or ten (10) packs.

One example of a prior art slackless type drawbar assembly is disclosed in U.S. Patent No. 5,000,330. The teachings of such U.S. Patent No. 5,000,330 are incorporated into the present application by reference thereto. Illustrated in this particular reference is a plurality of railway freight cars which have the adjacently disposed ends thereof connected together utilizing a slackless type drawbar assembly.

Most, if not all, of the slackless type drawbar assemblies, known by applicants to be in use prior to the present invention, include a relatively large number of frictionally engaged surfaces which are disposed on a number of different components. Each pair of these frictionally engaged surfaces is designed in a manner to allow movement to occur relative to one another.

The frictional wear which is exhibited by these frictionally engaged surfaces will generally result in rather frequent as well as costly maintenance having to be carried out on such prior art slackless type drawbar assemblies in order to maintain them in an acceptable and relatively safe operating condition for in-track service.

In addition to the rather substantial and, also, verifiable direct out of pocket expenses which are incurred by the railroad industry for both the labor and materials required to maintain these prior art type slackless drawbar assemblies, this relatively frequent maintenance requirement has a signifi-

cantly higher indirect cost that is associated therewith.

One of such indirect costs incurred is directly related to the fact that such railway freight cars will have to be, at least temporarily, removed from any type of revenue generating service, during the period of time that such routine maintenance on the slackless type drawbar assembly is being carried out. Obviously, all of both the direct cost and the indirect cost incurred must be passed on by the railroads to their customers, usually, in the form of higher freight rates.

SUMMARY OF THE INVENTION

The present invention provides a female connection member which can be readily utilized with an improved slackless type drawbar assembly which is specifically designed to connect together a pair of adjacently disposed ends of a pair of railway freight type cars in a substantially semi-permanent manner. The slackless type drawbar assembly to which the female connection member of the present invention is most applicable will include a ball and race assembly carried by a male connection member. This female connection member is disposed substantially entirely in and engageable with one end of a center sill portion, disposed beneath a bottom portion of a car body member, of a first railway car. A cavity is formed in such female connection member for receiving for movement therein a first end of male connection member. Such cavity being defined essentially by a back wall portion and a pair of side wall portions. An inner surface of each of such back wall portion and the pair of side wall portions having a predetermined configuration. There is a first opening, having a predetermined configuration, formed through a first one of such pair of side wall portions and an axially opposed second opening, also having a predetermined configuration, formed through a second one of such pair of side wall portions. An aperture is formed through a predetermined portion of such first end of the male connection member and has disposed therein at least a portion of a ball member (hereinafter referred to as a spherical shaped member). A pair of substantially horizontally disposed shaft members extend outwardly for a predetermined distance from axially opposed outer surfaces of such spherical shaped member. At least a portion of one of such pair of shaft members is disposed within the first opening formed through the first one of such pair of side wall portions and at least a portion of another one of such pair of shaft members is disposed within the second opening formed through the second one of such pair of side wall portions. Moreover, each respective one of such pair of shaft members in-

cludes an axially opposed and substantially flat surface portion formed thereon. There is a race assembly disposed within such aperture and secured to the first end of such male connection member. An inner surface of the race assembly is disposed around such portion of the spherical shaped member disposed within the aperture formed in such first end of such male connection member.

OBJECTS OF THE INVENTION

It is, therefore, one of the primary objects of the present invention to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars in which a ball and race assembly can be utilized adjacent at least one end of such slackless drawbar assembly.

Another object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which will enable a minimum number of components which must move relative to each other to be used, especially, when compared to the relatively high number of components that are required to move with respect to each other in the presently known prior art type slackless drawbar assemblies.

Still another object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which will, generally, require substantially less repair and/or routine maintenance, particularly, when compared to the repair and/or routine maintenance requirements of presently known prior art type slackless drawbar assemblies.

Yet another object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which will exhibit a relatively long operating service life, especially when compared to the normal operating service life of such presently known prior art type slackless drawbar assemblies.

A further object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which will be significantly more cost

effective for the user.

An additional object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which can be easily retrofitted into existing railway freight cars.

Still yet another object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which is lighter in weight than previously used conventional type couplers that require the use of yokes, draft gear, draft key members and follower members.

It is a still further object of the present invention to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which requires an absolute minimum number of frictionally engageable surfaces to be subjected to excessive frictional wear.

An additional object of the present invention is to provide a female connection member for use with a slackless type drawbar assembly that connects together, in a substantially semi-permanent fashion, the adjacently disposed ends of a pair of railway freight cars which does not require the use of any specialized tools and/or other equipment to install on a railway freight car.

Although a number of specific objects and advantages of the present invention have been described in some detail above, various additional objects and advantages of such female connection member for use with a slackless type drawbar assembly which incorporates a ball and race assembly at one end thereof will become much more readily apparent to those persons who are skilled in the railway freight car coupling art from the following more detailed description of the invention, particularly, when such detailed description is taken in conjunction with both the attached drawing Figures and with the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a top view, partially in cross section, that illustrates one presently preferred embodiment of the female connection member, constructed according to the present invention, which is connected to one end of an improved slackless type drawbar assembly;

Figure 2 is a side elevation view, partially in cross section, of such female connection member connected to such slackless type drawbar

assembly illustrated in Figure 1; and

Figure 3 is an end view taken along the lines III-III of Figure 1 which is, also, partially in cross section.

BRIEF DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS OF THE INVENTION

Prior to proceeding to the considerably more detailed description of the present invention, it should be noted that, for the sake of clarity, identical components, which have identical functions, have been designated with identical reference numerals throughout the several views that have been illustrated in the drawings.

Now reference is made, more particularly, to the drawing Figures 1 through 3 attached hereto. Illustrated therein is a presently preferred embodiment of a female connection member, generally designated, 10 which can be readily utilized as one of the critical components of an improved slackless type drawbar assembly, generally designated, 20. Such improved slackless type drawbar assembly 20 is utilized to connect together the adjacently disposed ends (not shown) of a pair of railway type freight cars (not shown), in a substantially semi-permanent fashion.

Such female connection member 10 has a first predetermined configuration. The shape, of the outermost surface portions of such first predetermined configuration, of such female connection member 10 is designed in a manner such that it will readily enable such female connection member 10 to be substantially disposed entirely within and secured, preferably, in a removable manner to a first end of a center sill portion 12 which, in turn, is secured to a bottom portion (not shown) of a car body member (not shown) of a railway freight car.

In the presently preferred embodiment of the invention, as illustrated, the female connection member 10 will be substantially restrained against any longitudinal movement within the center sill portion 12. Such restraint is achieved in a first longitudinal direction by rear stop members 13 and in an axially opposed second longitudinal direction by front draft stop members 15.

There is a support plate member 17 removably secured to such center sill portion 12 beneath such female connection member 10. This support plate member 17 prevents downward vertical movement of such female connection member 10.

A cavity 14 is formed in such female connection member 10. Such cavity 14 is at least defined by an inner surface 16, having a second predetermined configuration, of a back wall portion 18 and the respective inner surfaces 22 and 24 of a pair of side wall portions 26 and 28 of such female connection member 10. Each of these inner surfaces

22 and 24 will have a third predetermined configuration.

The second predetermined configuration of the inner surface 16 of back wall portion 18 will, preferably, be generally concave in both a vertical direction and a horizontal direction and such third predetermined configuration of such inner surfaces 22 and 24, on the other hand, will exhibit a generally convex shape in at least a horizontal direction. In the presently preferred embodiment of the invention, such inner surfaces 22 and 24 will have a generally convex shape in both such horizontal direction and in a vertical direction.

Formed through the first side wall portion 26 of such pair of side wall portions 26 and 28 is a first opening 30. The first opening 30 has a fourth predetermined configuration. In this embodiment, such fourth predetermined configuration of the first opening 30 will at least include each of a first generally round portion 32 and a first generally open bottom portion 34.

The specific function of such first round portion 32 and the first open bottom portion 34 of such first opening 30 will become more clear as the description of the presently preferred embodiment of the invention proceeds.

There is further provided in the female connection member 10 an axially opposed second opening 36, which exhibits a fifth predetermined configuration. Such second opening 36 is formed through the second side wall portion 28 of such pair of side wall portions 26 and 28.

It is presently preferred that the fourth predetermined configuration of such first opening 30 will be substantially identical to such fifth predetermined configuration of the second opening 36. However, it is to be understood that the present invention is not to be limited thereto.

The slackless type drawbar assembly 20, which such female connection member 10 of the present invention is particularly designed to be used with, further includes a male connection member, generally designated, 40 which has a sixth predetermined configuration.

At least a portion of a first end 38 of such male connection member 40 is adapted to be disposed for rotatable movement within the cavity 14 formed in such female connection member 10. The end surface 42 of such first end 38, which is disposed facing the inner surface 16 of such back wall portion 18 of female connection member 10 will, preferably, exhibit a generally convex shape in a plane disposed in each of a vertical direction and a horizontal direction. Preferably, except for such end surface 42, the first end 38 of such male connection member 40 will be generally rectangular in shape except for the radius portions disposed along the outer edges thereof.

Aa aperture 44 is formed through a predetermined portion of such male connection member 40 adjacent the first end 38 thereof. According to the presently preferred embodiment of the invention, such aperture 44 will be generally round and have a predetermined diameter.

Nevertheless, it is to be understood that various other shapes can be readily envisioned for such aperture 44 and that any of such various other shapes are contemplated to be within the broad scope of the claims directed to such invention.

Further included in the slackless drawbar assembly 20, used with the female connection member 10 of the present invention, is a ball-like member 46 (hereinafter referred to as a spherical shaped member 46). At least a predetermined portion of such spherical shaped member 46 is disposed within the aperture 44 formed through such first end 38 of the male connection member 40.

In the presently preferred embodiment of the invention, the outer surface of the spherical shaped member 46 will be a polished surface. Still more preferably, the polished outer surface of the spherical shaped member 46 will be a polished chrome plated surface.

There are a pair of substantially horizontally disposed shaft members 48 and 50 which extend outwardly for a predetermined distance from axially opposed outer surfaces 52 and 54 of such spherical shaped member 46. At least a portion of a first shaft member 50 is disposed within the generally round portion 32 of such first opening 30 formed through such first side wall portion 26 and at least a portion of a second shaft member 48 of such pair of shaft members 48 and 50 is disposed within the second opening 36 formed through the second side wall portion 28 of such pair of side wall portions 26 and 28.

Each respective one of such pair of shaft members 48 and 50 has an axially opposed and substantially flat surface portion 52 and 54 formed thereon. The function served by these substantially flat surface portions 52 and 54 will become clear as the detailed description of the present invention proceeds.

Although the invention is not to be limited thereto, it is presently preferred that both such spherical shaped member 46 and such pair of shaft members 48 and 50 will be formed as an integral single piece component.

There is a race assembly 56 having at least a portion thereof disposed within and adjacent the perimeter of such aperture 44 and secured to such first end 38 of the male connection member 40. According to one of the presently preferred embodiments of the invention, such race assembly 56 will be removably secured to the first end 38 of

such male connection member 40. However, it is considered to be within the scope of the present invention for such race assembly 56 to be welded to such first end 38 of the male connection member 40.

An inner surface of such race assembly 56 is disposed around such portion of the spherical shaped member 46 positioned within such aperture 44 formed in such male connection member 40. In this manner, the spherical shaped member 46 can be maintained substantially centered within the aperture 44.

In one alternative form of the presently preferred embodiment of the invention, there will be provided a substantially solid type lubricating liner member 58, such as manufactured by Kahr Rearring Co. and marketed under the tradename "KARLON", disposed intermediate the outer surface such spherical shaped member 46 and the inner surface of the race assembly 56.

A means, generally designated, 60 is engageable with both a second end 58 of such male connection member 40 and a second end (not shown) of another male connection member for securing the second end of such male connection member to the second end of such other male connection member.

Such means 60 may be as simple as providing a weldment which secures the second end 58 of such male connection member 40 to the second end of such other male connection member. In this case, the second end 58 of such male connection member 40 and the second end of such other male connection member will have a predetermined length which will be at least sufficient to provide the spacing required between the adjacently disposed ends of the pair of railway freight cars connected together by the improved slackless drawbar assembly 20 to enable such railway freight cars to easily negotiate any curves encountered on a track structure.

In the presently preferred embodiment of the invention, however, such securing means 60 will include a bar or pipe-like member 62 disposed intermediate and secured to the second end 58 of the male connection member 40 and the second end of such other male connection member.

When such pipe-like member 62 is used for securing such second end 38 of the male connection member 40 and such second end of such other male connection member together, then such second end of each of such male connection member 40 and the second end of such other male connection member will include a male member 58 inserted into respective opposed ends of said pipe-like member 62. On the other hand, when a solid bar-like member (not shown) is used to secure such second end 38 of the male connection mem-

ber 40 and the second end of such other female connection member together, then such second end 38 of the first male connection member 40 and the second end of such other female connection member will, preferably, include a sleeve-like portion (not shown) to receive a respective end of the bar-like member therein.

Further provided in the presently preferred embodiment of such slackless type drawbar assembly 20 is a pair of wedge means, generally designated, 70. Such wedge means 70 includes a pair of wedge members 64 each having a bolt 66 disposed therethrough in a longitudinal direction and a washer means 68. Preferably such washer means 68 will be Bellville type washers.

A first one of such pair of wedge members 64 includes a tapered surface 72 engaged with a first flat surface portion 52 of such axially opposed and substantially flat surface portions 52 and 54 formed on the pair of shaft members 48 and 50. A substantially flat and vertical surface 74 disposed on the first one of the wedge members 64 is engaged with a mating surface 76 of a respective front draft stop member 15.

The second one of such pair of wedge members 64 includes a tapered surface 78 engaged with a second flat surface portion 54 of such axially opposed and substantially flat surface portions 52 and 54 formed on the pair of shaft members 48 and 50. There is a substantially flat and vertical surface 80 disposed on the second one of the wedge members 64 engaged with a mating surface 82 of a respective front draft stop member 15.

While a number of presently preferred and various alternative embodiments of the present invention have been described in detail above, with particular reference to the Figures illustrated in the drawings, it should be understood by those persons who are skilled in the railway freight car type coupling art that it is possible for a number of additional modifications and/or adaptations of such female connection member for use with an improved slackless type drawbar assembly to be made without departing from either the spirit or the scope of the appended claims.

Claims

1. A female connection member for use in an improved slackless type drawbar assembly which connects adjacently disposed ends of a pair of railway cars together in a substantially semi-permanent manner, said female connection member comprising:

(a) a member, having a first predetermined configuration, engageable in one end of a center sill portion which is secured to a bottom portion of a car body member of a

railway freight car;

(b) a cavity formed in said member, said cavity being defined by a back wall portion of said female connection member and a pair of side wall portions of said female connection member, said back wall portion having a second predetermined configuration and said pair of side wall portions having a third predetermined configuration;

(c) a first opening, having a fourth predetermined configuration, formed through a first one of said pair of side wall portions for receiving therein a first shaft member disposed on a spherical shaped member carried by a male connection member; and

(d) an axially opposed second opening, having a fifth predetermined configuration, formed through a second one of said pair of side wall portions for receiving therein a second axially opposed shaft member disposed on such spherical shaped member carried by such male connection member.

2. A female connection member, according to claim 1, wherein a shape of outer surface portions of said female connection member is designed in a manner such that said female connection member can be disposed substantially entirely within and engaged to one end of a center sill portion of a railway freight car.

3. A female connection member, according to claim 1, wherein said second predetermined configuration of said inner surface of said back wall portion of said female connection member will be generally concave in both a vertical direction and a horizontal direction.

4. A female connection member, according to claim 3, wherein said third predetermined configuration of said inner surfaces of each of said pair of side wall portions of said female connection member will be generally convex shaped in at least a horizontal direction.

5. A female connection member, according to claim 4, wherein said third predetermined configuration of said inner surfaces of each of said pair of side wall portions of said female connection member will be generally convex shaped in both a horizontal direction and a vertical direction.

6. A female connection member, according to claim 1, wherein said fourth predetermined configuration of said first opening formed through said first one of said pair of side wall portions will at least include a generally round

portion and a generally open bottom portion.

7. A female connection member, according to claim 6, wherein said fifth predetermined configuration of said axially opposed second opening formed through said second one of said pair of side wall portions at least includes a generally round portion and a generally open bottom portion.

8. A female connection member, according to claim 1, wherein said female connection member is formed as an integral single piece casting.

9. A female connection member, according to claim 1, wherein said member of said female connection member is generally U-shaped.

10. A female connection member, according to claim 9, wherein said pair of side wall portions flare outwardly from outer edges of said back wall portion of said member.

11. In an improved slackless type drawbar assembly for connecting together adjacently disposed ends of a pair of railway cars in a substantially semi-permanent fashion which includes a female connection member, a male connection member having at least a portion of a first end thereof movably disposed within such female connection member, an aperture formed through a predetermined portion of such male connection member adjacent such first end thereof receives at least a portion of a spherical shaped member therein, a first pair of horizontally disposed shaft members extending outwardly for a predetermined distance from axially opposed outer surfaces of such spherical shaped member, each respective one of such pair of shaft members includes an axially opposed and substantially flat surface portion thereon, a race assembly is disposed within such aperture and secured to such first end of such male connection member, an inner surface of such race assembly being disposed around such portion of such spherical shaped member disposed within such aperture formed in such male connection member, a means engageable with a second end of such male connection member and a second end of another male connection member for securing such second end of such male connection member to such second end of such other male connection member, a pair of wedge means, a first one of such pair of wedge means being engaged with a first one of such axially opposed and substantially flat surface

portions formed on such pair of shaft members and a second one of such pair of wedge means being engaged with a second one of such axially opposed and substantially flat surface portions formed on such pair of shaft members, the improvement comprising a specially designed female connection member to enable use of a slackless type drawbar assembly having a ball and race assembly disposed on one end thereof, said specially designed female connection member including:

(a) a member, having a first predetermined configuration, engageable in one end of a center sill portion which is secured to a bottom portion of a car body member of a railway freight car;

(b) a cavity formed in said member, said cavity being defined by a back wall portion of said female connection member and a pair of side wall portions of said female connection member, said back wall portion having a second predetermined configuration and said pair of side wall portions having a third predetermined configuration;

(c) a first opening, having a fourth predetermined configuration, formed through a first one of said pair of side wall portions for receiving therein a first shaft member disposed on a spherical shaped member carried by a male connection member; and

(d) an axially opposed second opening, having a fifth predetermined configuration, formed through a second one of said pair of side wall portions for receiving therein a second axially opposed shaft member on such spherical shaped member carried in such aperture formed through such first end of such male connection member.

12. An improved slackless type drawbar assembly, according to claim 11, wherein said assembly further includes a substantially solid type lubricating liner member disposed intermediate said spherical shaped member and said inner surface of said race assembly.

13. An improved slackless type drawbar assembly, according to claim 11, wherein said means engageable with a second end of said male connection member for securing said second end of said male connection member to a second end of said other male connection member is a weldment.

14. An improved slackless type drawbar assembly, according to claim 11, wherein said means engageable with a second end of said male connection member for securing said second

end of said male connection member to said second end of said other male connection member includes at least one of a bar-like and a pipe-like member disposed intermediate and secured to said second end of said male connection member and said second end of said other male connection member.

15. An improved slackless type drawbar assembly, according to claim 14, wherein said pipe-like member is disposed intermediate and secured to said second end of said male connection member and said second end of said other male connection member and said second end of each of said male connection member and said second end of said other male connection member includes a male member inserted into respective opposed ends of said pipe-like member.

16. An improved slackless type drawbar assembly, according to claim 1, wherein a shape of outer surface portions of said female connection member is designed in a manner such that said female connection member can be disposed substantially entirely within and engaged to a first end of a center sill portion of a railway freight car.

17. An improved slackless type drawbar assembly, according to claim 11, wherein said second predetermined configuration of said inner surface of said back wall portion of said female connection member will be generally concave in both a vertical direction and a horizontal direction.

18. An improved slackless type drawbar assembly, according to claim 17, wherein said third predetermined configuration of said inner surfaces of each of said pair of side wall portions of said female connection member will be generally convex shaped in at least a horizontal direction.

19. An improved slackless type drawbar assembly, according to claim 18, wherein said third predetermined configuration of said inner surfaces of each of said first pair of side wall portions of said first female connection member will be generally convex shaped in both a horizontal direction and a vertical direction.

20. An improved slackless type drawbar assembly, according to claim 1, wherein said first end of said male connection member is generally rectangular in shape.

21. An improved slackless type drawbar assembly, according to claim 20, wherein said first end of said male connection member includes a surface, disposed facing said inner surface of said back wall portion of said female connection member, which is convex shaped in each of a vertical direction and a horizontal direction. 5
22. An improved slackless type drawbar assembly, according to claim 11, wherein said fourth predetermined configuration of said first opening formed through said first one of said pair of side wall portions and said fifth predetermined configuration of said axially opposed second opening formed through said second one of said pair of side wall portions will at least include a generally round portion and a generally open bottom portion. 10 15
23. An improved slackless type drawbar assembly, according to claim 11, wherein said aperture formed through said predetermined portion of said male connection member adjacent said first end thereof is generally round and has a predetermined diameter. 20 25
24. An improved slackless type drawbar assembly, according to claim 11, wherein said race assembly is removably secured to said first end of said male connection member. 30
25. An improved slackless type drawbar assembly, according to claim 11, wherein said spherical shaped member and said pair of shaft members are formed as an integral single piece component. 35
26. An improved slackless type drawbar assembly, according to claim 11, wherein said spherical shaped member includes a chrome plating on an outer surface thereof. 40
27. An improved slackless type drawbar assembly, according to claim 26, wherein said chrome plated outer surface of said spherical shaped member is polished. 45
28. An improved slackless type drawbar assembly, according to claim 11, wherein said pair of wedge means includes a pair wedge members each having a bolt disposed therethrough in a longitudinal direction and washer means, a first one of said pair of wedge members includes a tapered surface engaged with a first flat surface portion of said axially opposed and substantially flat surface portions formed on said pair of shaft members and a substantially flat and vertical surface disposed on said first one of said pair of wedge members is engaged with a mating surface of a respective front draft stop member and a second one of such pair of wedge members includes a tapered surface engaged with a second flat surface portion of said axially opposed and substantially flat surface portions formed on said pair of shaft members, a substantially flat and vertical surface disposed on said second one of said pair of wedge members engages with a mating surface of a respective front draft stop member. 50
29. An improved slackless type drawbar assembly, according to claim 28, wherein said washer means are Bellville type washers. 55

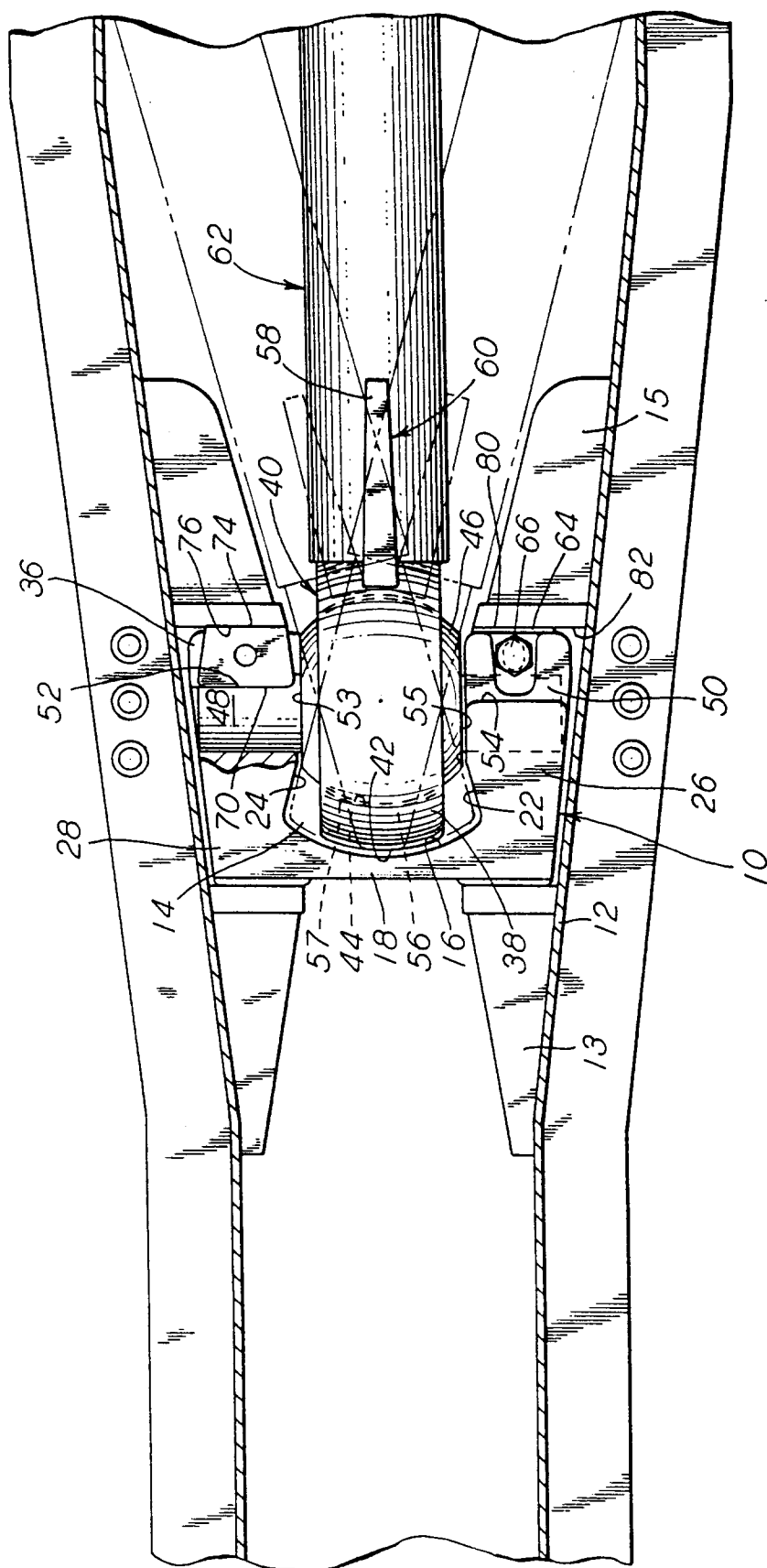


FIG. 1

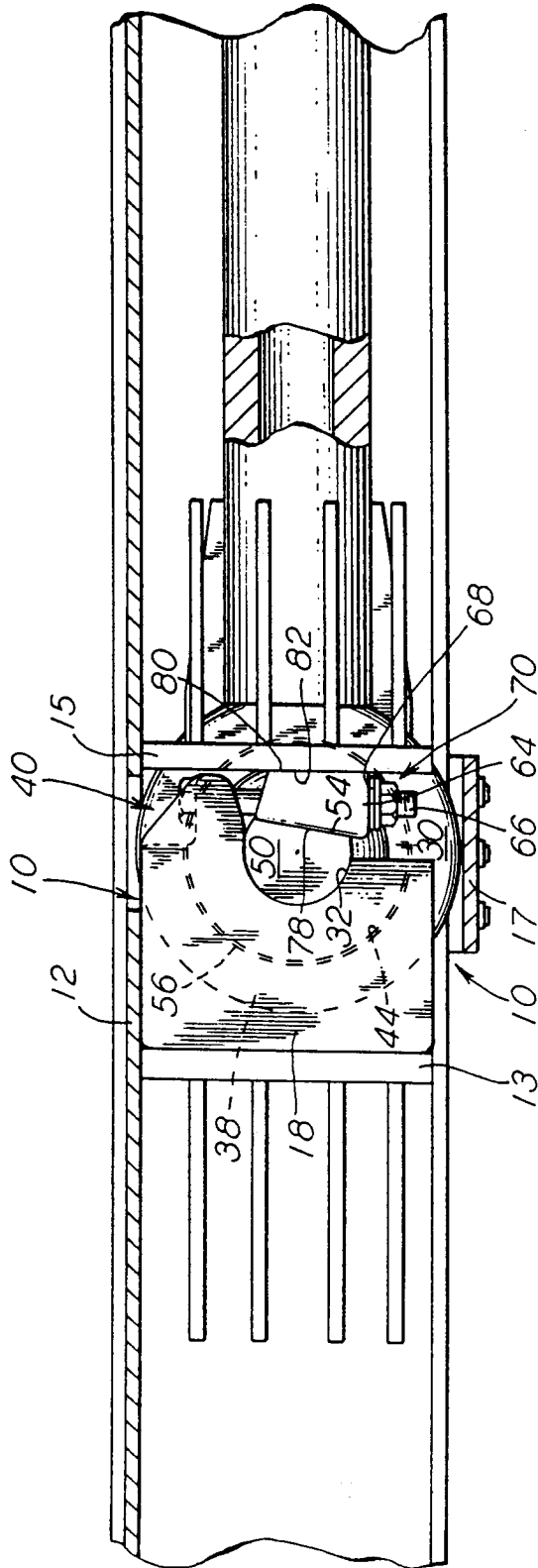


FIG. 2

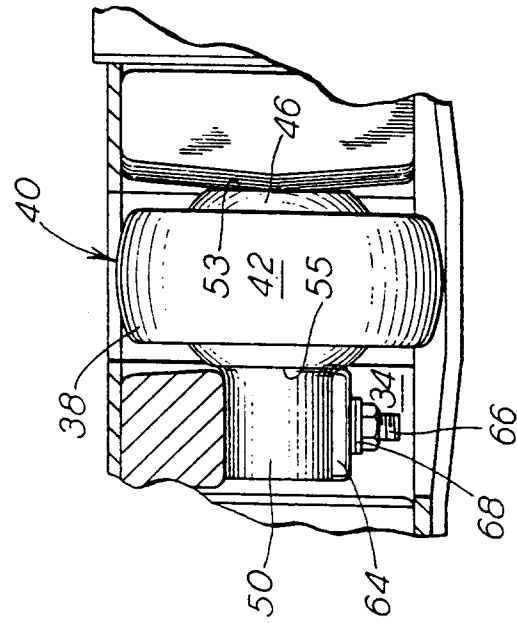


FIG. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 94113994.1
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)
A	<u>EP - A - 0 582 035</u> (WESTINGHOUSE) * Fig. 1-4 * ---	1, 11	B 61 G 5/02
A	<u>EP - A - 0 456 222</u> (WESTINGHOUSE) * Fig. 1 * ---	1, 11	
D, A	<u>US - A - 5 000 330</u> (KAIM) * Fig. 2, 3 * -----	1, 11	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 6)
			B 61 G
The present search report has been drawn up for all claims			
Place of search VIENNA	Date of completion of the search 29-12-1994	Examiner PANGRATZ	
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	