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(54) SIDEFRAME PEDESTAL

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(57) **ABSTRACT**

Freight truck castings on freight trucks have an interface between the freight car truck sideframe and a bearing assembly or bearing adapter. The present invention includes a sideframe with a pedestal jaw, placing a bearing assembly inside the pedestal jaw, and forming a pedestal roof in the pedestal jaw in a shape to evenly distribute a load between the pedestal roof and the bearing assembly. The present invention also provides for reducing load concentration on an interface between a pedestal roof and an axle. The present invention provides a sideframe with two pedestal roofs disposed at opposite ends of the sideframe, an axle placed under the pedestal roof, and an angled interface. The angled interface is formed between the pedestal roof and bearing adapter to reduce load concentration.

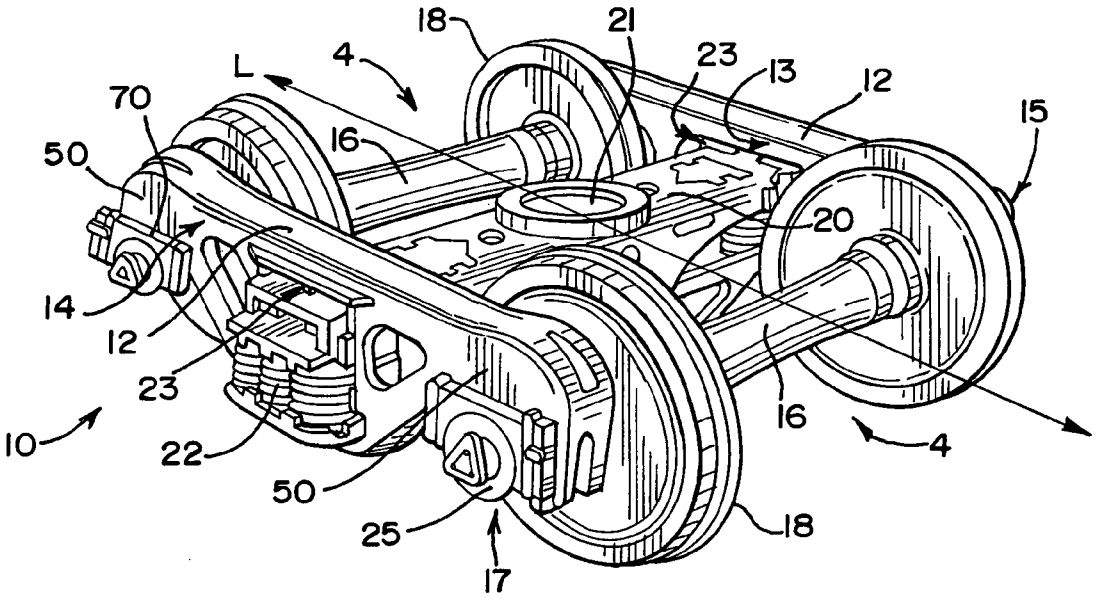
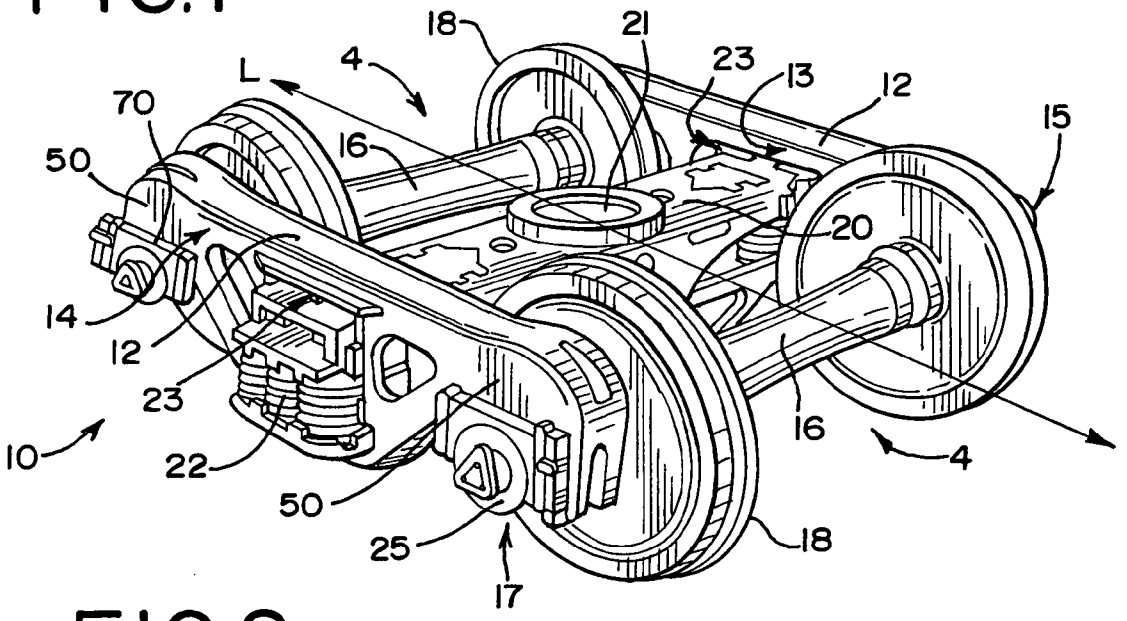


FIG.1


18
21
4
L
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13
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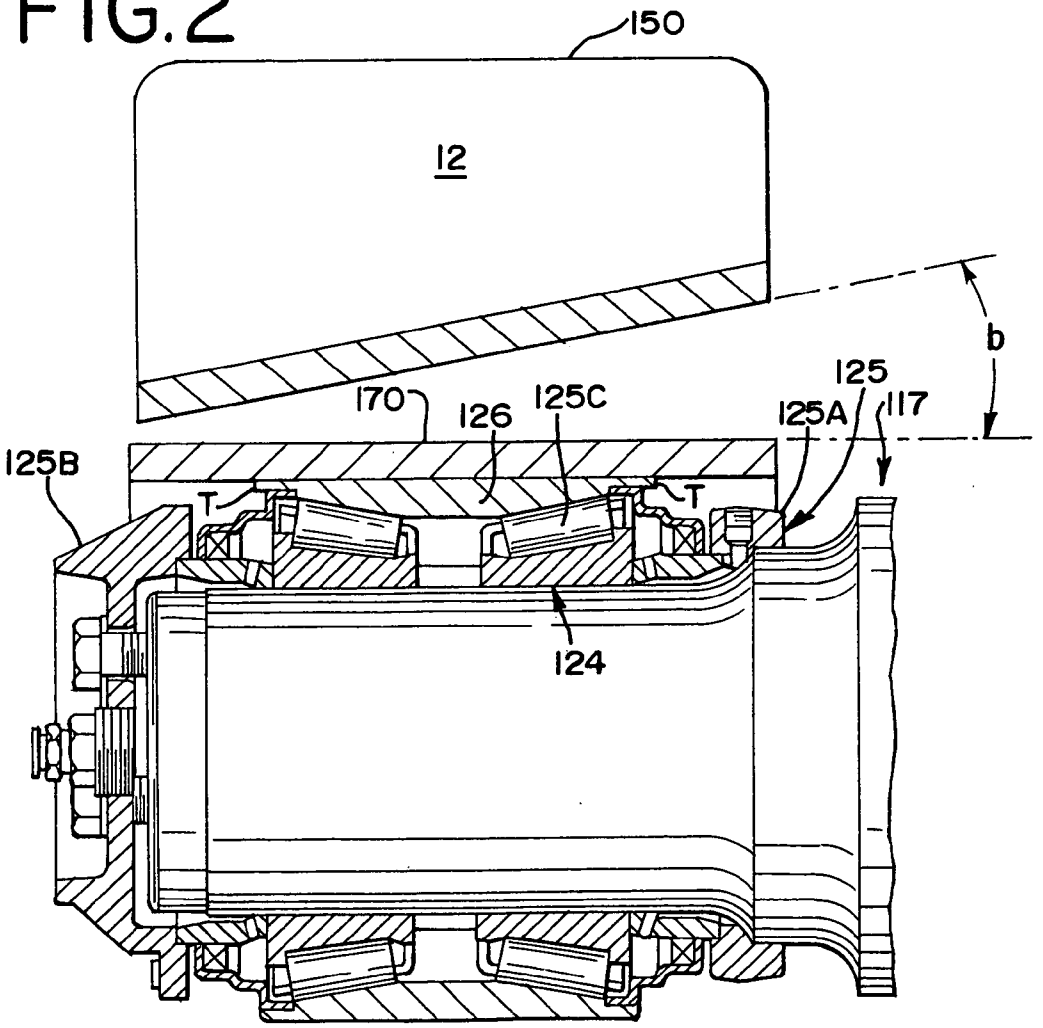
17

FIG.2


150
12
b
125
170
126
125C
125A
117
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T
124

FIG. 3
PRIOR ART

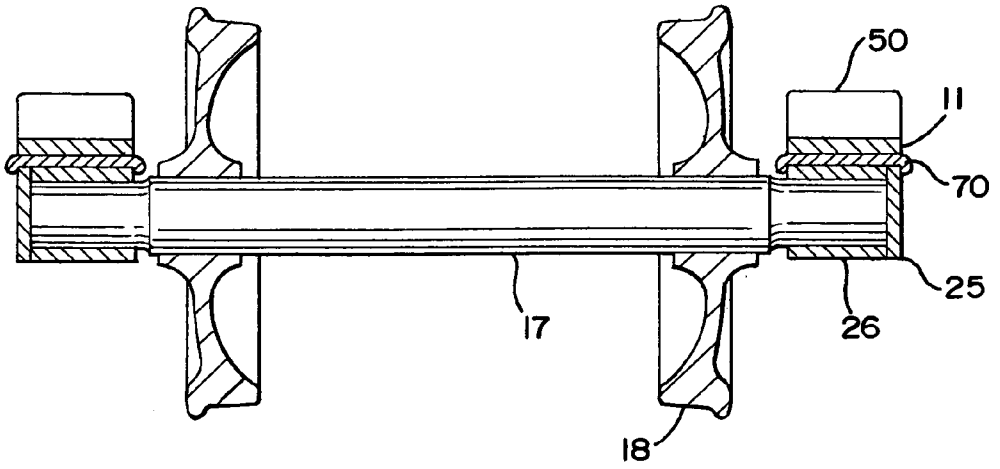


FIG. 4
PRIOR ART

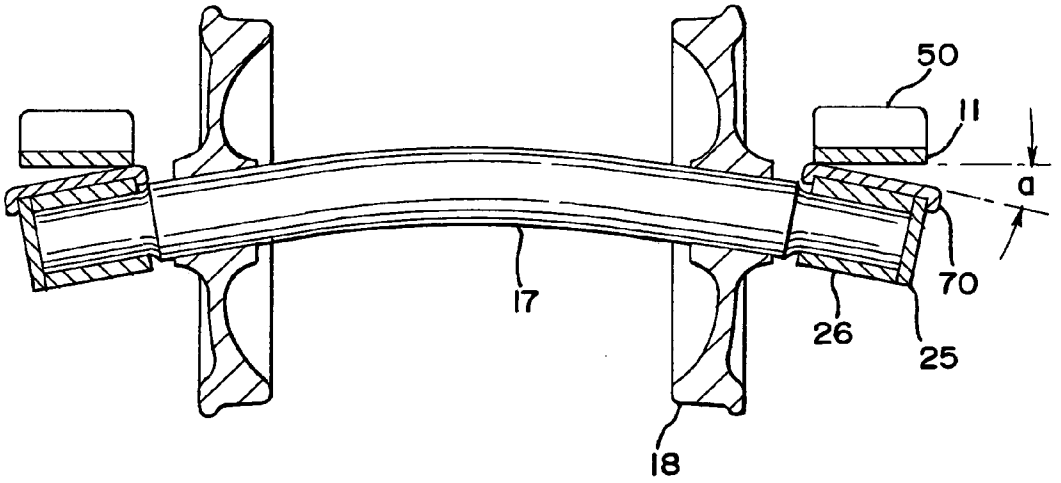


FIG. 5

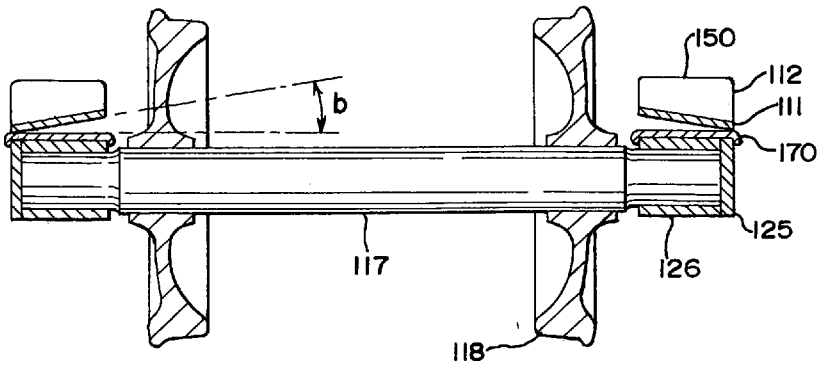


FIG. 6

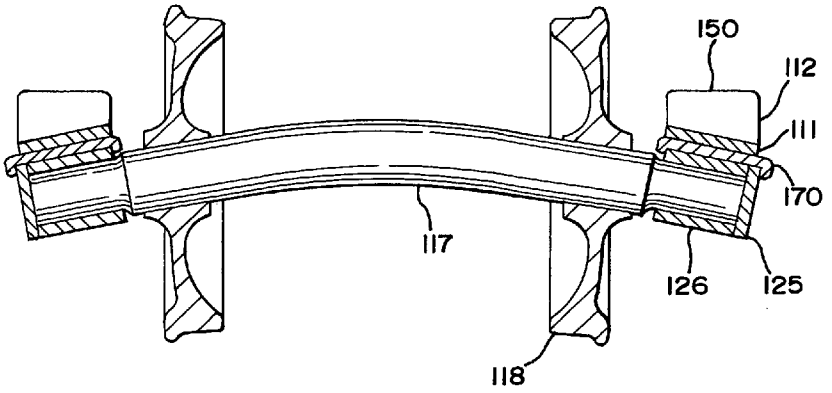


FIG. 7

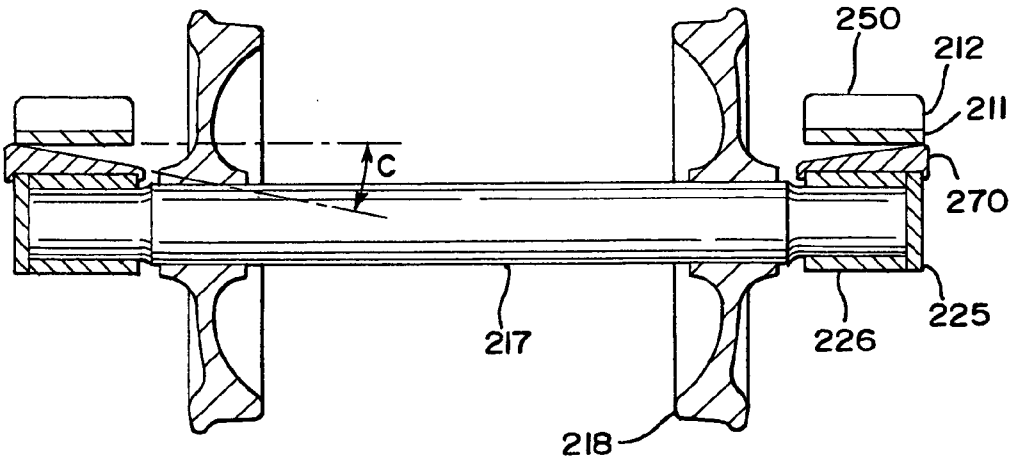
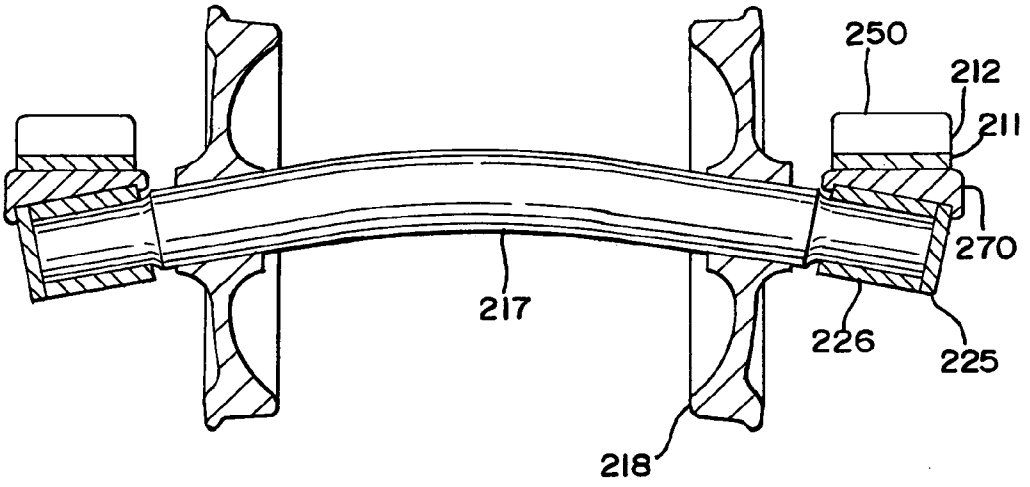


FIG. 8



SIDEFRAME PEDESTAL

BACKGROUND OF INVENTION

[0001] The present invention relates to railway freight car trucks and, more particularly, to a freight car truck sideframe and the interface between the freight car truck sideframe and a bearing assembly.

[0002] Freight car truck sideframes are known that have a sideframe pedestal design which is flat and in a horizontal plane or having 15 inches of maximum radius along the longitudinal edges starting a specified distance from the center line. The 15 inches of maximum radius option is shown in Association of American Railroads (AAR) standard S-325-94, "Limiting Dimensions for AAR Alternate Standard Pedestal Type Sideframes."

[0003] The flat horizontal roof of such known designs do not compensate for a deflection of the bolster and axle that occurs under loaded car conditions. With increasing axle loads commonly used in service, this deflection has increased. The combination of increased axle load and increased deflection has caused additional load to be concentrated on the bearing assembly, for example the inner race of the roller bearing elements that is part of the bearing assembly, located at the end of the axle. One example of a bearing assembly is a roller bearing and the load would concentrate on the inner race of the roller bearing elements. This increased load concentration reduces the life of the bearing assembly. Another embodiment of the present invention has a bearing assembly including a bearing adapter.

[0004] One embodiment of the present invention provides an angled non horizontal surface in a sideframe pedestal roof. The angle in one embodiment of the present invention is about the longitudinal axis of the sideframe. The angle is specifically selected to compensate for the deflection in the bolster and axle structure when a car is loaded and disperses the load about a length on the bearing assembly to reduce the load concentration on the bearing assembly.

[0005] Another embodiment of the present invention provides an angled non horizontal surface in a bearing adapter. The angle in the bearing adapter is about the longitudinal axis of the sideframe pedestal roof. The angle is specifically selected to compensate for the deflection in the bolster and axle structure when a car is loaded and disperses the load about a length on the bearing assembly to reduce the load concentration on the bearing assembly.

SUMMARY OF THE INVENTION

[0006] It is an object of the present invention to provide a method of compensating for the deflection in a bolster in a freight car truck under load.

[0007] It is another object of the present invention to provide a method of evenly distributing a load concentration on an interface between a sideframe pedestal and an axle.

[0008] It is another object of the present invention to provide a device for compensating for the deflection in an axle in a freight car truck under load.

BRIEF DESCRIPTION OF DRAWINGS

[0009] FIG. **1** is a perspective view of a railway truck showing a sideframe pedestal according to one embodiment of the present invention;

[0010] FIG. **2** is a side cross sectional detailed view of a bearing assembly, axle and sideframe in an unloaded condition, according to an embodiment of the present invention;

[0011] FIG. **3** is a side cross sectional view of a prior art bearing assembly, axle and sideframe in an unloaded condition;

[0012] FIG. **4** is a side cross sectional view of a prior art bearing assembly, wheel set and sideframe in a loaded condition;

[0013] FIG. **5** is a side cross sectional view of a bearing assembly, axle and sideframe in an unloaded condition, according to an embodiment of the present invention;

[0014] FIG. **6** is a side cross sectional view of a bearing assembly, axle and sideframe in a loaded condition, according to an embodiment of the present invention;

[0015] FIG. **7** is a side cross sectional view of a bearing assembly, axle, and sideframe in an unloaded condition, according to a second embodiment of the present invention;

[0016] FIG. **8** is a side cross sectional view of a bearing assembly, axle and sideframe in a loaded condition, according to a second embodiment of the present invention.

DETAILED DESCRIPTION

[0017] Referring now to FIG. **1** of the drawings, a railway vehicle truck **10** is shown having a sideframe pedestal **11**. Railway truck **10** has a first sideframe **12** and a second identical sideframe **12** laterally spaced and disposed in a generally parallel relationship to truck longitudinal axis L. Each sideframe **12** has an inboard face **13** and an outboard face **14**. Sideframes **12** are mounted in pairs on a pair of spaced wheelsets **4**. One wheelset **4** includes an axle **16**, mounted wheels **18** and bearing assemblies **25**. An axle **16** has a first axle end **15** and a second axle end **17**. Bearing assemblies **25** are mounted at the first axle end **15** and second axle end **17**.

[0018] Each sideframe **12** has a pedestal jaw **50** at each end and a bolster opening **23** at the sideframe midsection. A bolster **20** extends between each of the sideframe bolster openings **23** and is supported by springs **22**. Bolster **20** may be connected to a railcar underside at a centrally-located center plate **21**.

[0019] Referring to FIG. **2**, according to one embodiment of the present invention, bearing assembly **125** is held on axle end **117** by backing ring **125**A and by axle end cap **125**B. Bearing assembly **125** has a roller type bearing **125***c* with outer race **126** and inner race **124**. The inner race **124** is pressed onto axle end **117** and rotates with the axle end **117**. Bearing adapter **170** contacts outer race **126**. Pedestal roof **111** contacts bearing adapter **170**, in some applications there may not be a bearing adapter **170** and the pedestal roof may be in direct contact with the outer race **126**.

[0020] Referring to FIG. **3** and **4**, a prior art design is shown. In FIG. **3**, is side frame **50**, bearing assembly **25** bearing adapter **70**, and pedestal roof **11** are shown under a no load condition. Pedestal roof **11** is generally horizontal, and under the no load condition the load is evenly distributed. It should be noted that loading in bearing assembly **25** in an unloaded condition is quite insignificant, with only the weight of the unloaded freight car, typically from 40,000 to

60,000 pounds, distributed over four locations on two freight car trucks. Under load, 200,000 to 250,000 additional pounds of loading is added, one half to each truck. As shown in FIG. **4**, side frame **50**, bearing assembly **25**, bearing adapter **70**, and pedestal roof **11** are shown under load. A deflection angle a of from 0-5 degrees is produced from the loaded condition, with the load concentrated the inner portion of bearing outer race **26** causing unnecessary stress on bearing assembly **25**.

[**0021**] Referring to FIG. **5**, according to one embodiment of the present invention, pedestal roof **111**, bearing assembly **125**, and adapter **170**, are shown with axle **117** and wheels **118** and sideframe **112** and bolster **120** under no load. Pedestal roof **111** has a deflection compensator angle b cut into pedestal roof **111**. The deflection compensator angle b of from 0 to 5 degrees, is shaped to evenly distribute the load over a bearing adapter **170**, bearing assembly **125**, under loaded conditions.

[**0022**] Under the unloaded condition of FIG. **5**, the load from an empty freight car is concentrated at the outer portions of bearing adapter **170** and outer bearing race **126**. However, as explained above, the bearing loading under such an unloaded condition is quite insignificant. Axle **117** is, for all purposes, straight.

[**0023**] Referring now to FIG. **6**, according to the embodiment of FIG. **5** of the present invention, pedestal roof **111**, bearing assembly **125** and adapter **170** are shown under a loaded condition. Axle **117** is bowed due to the loading received at the ends through bearings **125**, bearing adapter **170** and sideframes **112**. Bolster **120** is also bowed, resulting in an outward rotation of side frame **112**. However, as pedestal roof **111** has a deflection compensator angle b cut into pedestal roof **111**, the load is evenly distributed from pedestal roof **111** to bearing adapter **170** to bearing assembly **125**.

[**0024**] Referring to FIG. **7**, another embodiment of the present invention is shown. Pedestal roof **211**, bearing assembly **225**, and bearing adapter **270** are shown, along with sideframe **212**, axle **217** and wheels **218** and bolster **220**. Bearing adapter **270** has a deflection compensator angle c cut into it. The deflection compensator angle is between 0 and 5 degrees. Such angle is shaped to evenly distribute load over bearing adapter **270**, and bearing assembly **225** under loaded conditions.

[**0025**] Under the unloaded conditions of FIG. **7**, the load from an empty freight car is concentrated at the outer portion of bearing adapter **270** and thusly outer bearing race **226**. However, as explained above, the bearing loading under such an unloaded condition is quite insignificant. Axle **117** is for all purposes, straight.

[**0026**] Referring now to FIG. **8**, the embodiment of FIG. **7** is shown under a loaded condition. Pedestal roof **211**, bearing assembly **225** and adapter **270** are present. Axle **217** is bowed due to the loading received at its ends through bearings **225**, bearing adapter **270**, and sideframe **212**. Side frame **220** is also rotated outward due to bowing of bolster **120** under load. However, as bearing adapter **270** has a deflector compensator angle c cut into it, pedestal roof **211** has its load evenly distributed from pedestal roof **211**, through bearing adapter **270** to bearing assembly **225**.

What is claimed is:

1. A method of compensating for the deflection in an axle in a freight car truck comprising the steps of:

providing a sideframe with a pedestal roof;

placing a bearing assembly under the pedestal roof; and

forming the pedestal roof in a shape to equally distribute load axially across the bearing assembly.

2. The method of claim 1 further comprising the step of placing the bearing assembly in a bearing adapter before placing the bearing assembly under the pedestal roof.

3. The method of claim 1 wherein the shape in the pedestal roof is an angle to conform to a bearing adapter, the bearing adapter in substantially even contact with the pedestal roof when the freight car truck is under load.

4. The method of claim 3 wherein the deflection has a deflection angle in the range of 0 degrees to 5 degrees.

5. A method of reducing a load concentration on an interface between a sideframe and an axle in a freight car truck comprising the steps of:

providing a sideframe with two pedestal roofs disposed at opposite ends of the sideframe;

placing an axle inside the pedestal roof;

providing a bearing assembly and bearing adapter connected to an end of the axle,

forming an angled interface between the pedestal roof and the bearing adapter, wherein

the bearing adapter contacts the pedestal roof and transfers a freight car load substantially

evenly to the bearing assembly.

6. The method of claim 5 wherein the bearing adapter is shaped at an acute angle to the pedestal roof.

7. The method of claim 6 wherein the angle of the bearing adapter to the pedestal roof is between 0 and 5 degrees.

8. The method of claim 6 wherein the bearing adapter contacts the pedestal roof substantially evenly and transfers the freight car load substantially evenly from the pedestal roof to the bearing assembly.

9. A freight car truck comprising:

a sideframe with a pedestal jaw;

a bearing assembly within the pedestal jaw;

a pedestal roof formed in the pedestal jaw with an angled shape to substantially evenly distribute a freight car load between the pedestal roof and the bearing assembly.

10. The freight car truck of claim 9 wherein the bearing assembly has a bearing adapter, the bearing adapter contacting the pedestal roof.

11. The freight car truck of claim 9 wherein the shape is an acute angle with an edge to conform to an outside edge of the bearing adapter under a no load condition.

12. The freight car truck of claim 9 wherein the shape is an axial angle in the range of 0 to 5 degrees.

13. The freight car truck of claim 9 wherein the deflection is an angled arc with a center of the arc being parallel to the sideframe.

14. The freight car truck of claim 10 wherein the angled shape in the pedestal roof is in substantially even contact with the bearing adapter when the freight car is under load.

15. A freight car truck comprising:

a sideframe with two pedestal roofs disposed at opposite ends of the sideframe;

an axle placed under the pedestal roof; and

a bearing assembly and bearing adapter connected to an end of the axle forming an angled interface between the pedestal roof and the bearing roof and transfers a freight car load substantially evenly to the bearing assembly.

16. The freight car truck of claim 15 wherein the bearing adapter is shaped at an acute angle to the pedestal roof.

17. The freight car truck of claim 16 wherein the angle of the bearing adapter to the pedestal roof is between 0 and 5 degrees.

18. The freight car truck of claim 15 wherein the bearing adapter contacts the pedestal roof substantially evenly and transforms the freight car load substantially evenly from the pedestal roof to the bearing assembly.

19. The device of claim 15 wherein the angled interface is an arc with a center of the arc being parallel to a sideframe.

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