March 16, 1937. L. S. BROWN 2,073,829

VEHICLE AXLE

Filed June 8, 1934

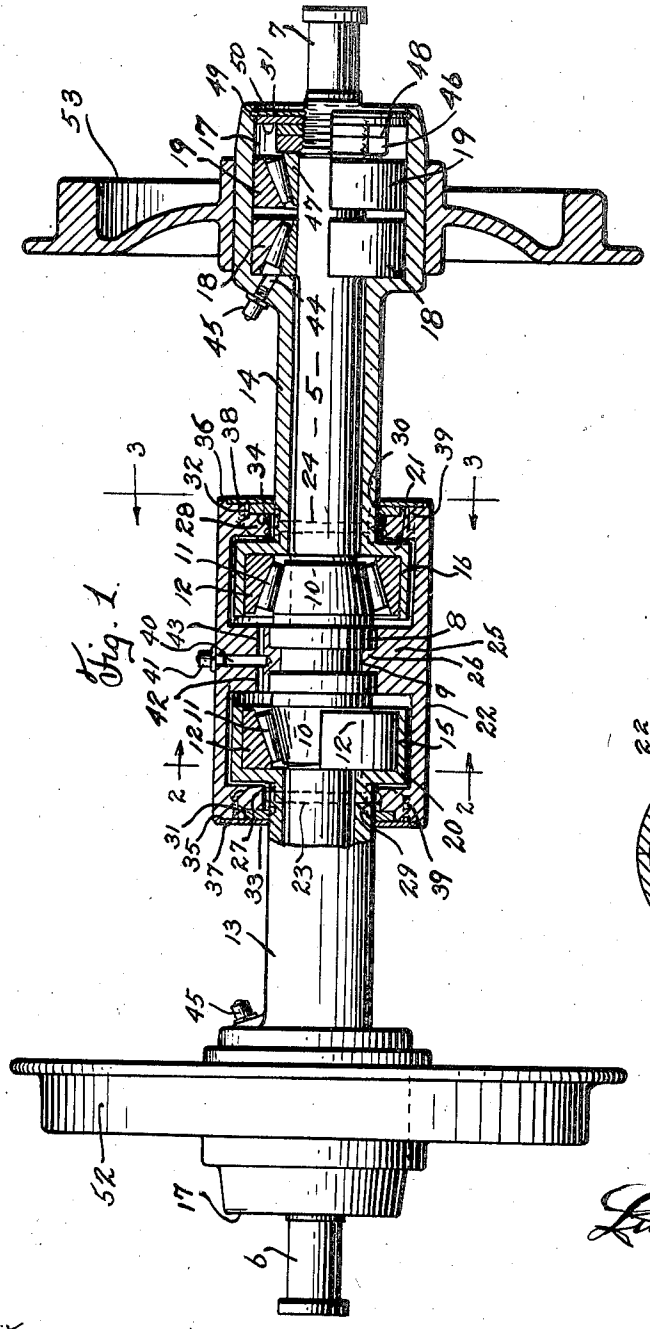


Fig. 1.

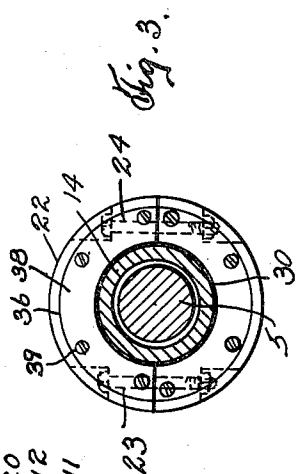


Fig. 3.

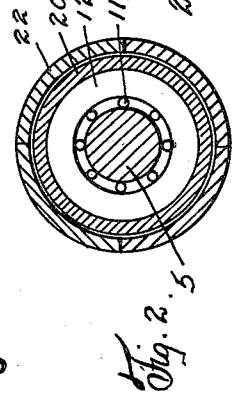


Fig. 2.

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VEHICLE AXLE

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2 Claims. (Cl. 295—38)

My invention relates primarily to railway equipment such as freight and passenger cars, locomotives and other prime movers, etc., although it is not limited to any specific type of vehicle or equipment and it has for its object the provision of mechanism of the above character so constructed and arranged as to operate in effect as a differential whereby the wheels carried by the axle or mounted thereon may be rotated freely and independently of each other, or may rotate together in unison, in either direction or in opposite directions, or in any other manner governed by the roadway over which the vehicle is moving, the wheels adapting themselves to the varying condition of the terrain, and at the same time retain their permanent alinement with each other and with the vehicle to which the device is attached.

Another object is to provide, in a device of the above character means whereby, in use with cars and the like traveling on rails, the wheels carried by the axle will automatically adjust themselves to said rails and travel around curves, etc., freely without slipping or friction, or like interference.

Another object is to provide an axle which, when used with vehicles traveling on rails, such as railway cars and the like, will permit the wheels carried thereby to automatically adjust their rate of rotation to the varying arcs of curvature of the curves or bends in the rails thereby obviating slippage or friction between the wheels and rails and doing away with the necessity for lubricating these curves or bends periodically.

A still further object is to provide a device of the above character which, while being comparatively cheap in construction, will be of a maximum efficiency in operation, with a minimum cost of upkeep and operation.

Other objects and advantages will appear hereinafter and, while I have shown and will describe the preferred form of my invention, it will be understood that I do not limit myself to such preferred form but that various changes and adaptations may be made therein without departing from the spirit of my invention.

In the drawing accompanying and forming a part hereof:

Fig. 1 is a central longitudinal section, partly in elevation, of a railway car axle constructed according to my invention.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Referring to the drawing 5 indicates an axle of the type usually associated with railway cars and other similar railway equipment, having the journals 6 and 7 at opposite ends thereof by means of which the axle is mounted within the usual axle boxes, not shown, of the car.

Formed around the axle 5, centrally of its length, and preferably integral therewith, is a collar 8 provided in its periphery with a central groove or recess 9. Mounted upon the axle 5, at each side of the collar 8 are anti-friction bearings preferably of the type known commercially as "Timken" and consisting of the cone 10, rollers 11 and the outer race 12.

Surrounding shaft or axle 5 at opposite sides of the collar 8, and extending from the collar 8 to the inner termination of the journals 6 and 7, are rotatable sleeves 13 and 14, the innermost ends of which terminate in enlarged recesses 15 and 16 within which are positioned the races 12 of the anti-friction bearings. The outermost ends of the sleeves 13 and 14 terminate in enlarged recesses or sockets 17 and mounted within these sockets are oppositely positioned anti-friction bearings 18 and 19, also preferably of the type known commercially as "Timken" bearings, which serve as means for rotatably supporting said sleeves 13 and 14 upon axle 5.

Surrounding the inner enlarged portions 20 and 21 of the sleeves 13 and 14 is a housing 22, preferably divided into two halves lengthwise and bolted together by means of the bolts 23 and 24 to form a unitary whole. Provided centrally of the inner perimeter of this housing is an inwardly extending flange 25 which bears against the outer periphery of the collar 8 and is provided with a narrowed integral tongue 26 adapted to fit snugly within the groove or recess 9, thus preventing relative lengthwise movement of the said housing and axle 5. The outer ends of the housing 22 terminate in inwardly extending annular flanges 27 and 28 at a point immediately adjacent to the outer walls of the enlarged portions 20 and 21 of the sleeves 13 and 14 whereby said enlarged portions are inclosed within said housing.

Provided in the outer faces of the flanges 27 and 28 to surround the openings 29 and 30, through which pass the sleeves 13 and 14, are enlarged recesses or sockets 31 and 32 and removably mounted in these recesses are dust washers 33 and 34 of felt or other similar material by means of which dust and other foreign material is prevented from entering the housing 22 through the openings 29 and 30, and surrounding the outer termination of these recesses

are enlarged recesses 35 and 36 for the reception of steel discs or washers 37 and 38. Discs 37 and 38 are of necessity formed in two halves and are held in position for use by screws 39, or other suitable means.

Extending radially through the wall of housing 22 and the flange 25 and terminating near the inner perimeter of the tongue 26 is an opening 40 in the outer end of which is mounted a self closing oil or grease fitting 41 whereby suitable lubricant may be forced into the housing 22. Projecting from opposite sides of the opening 40, at the inner termination thereof, are ports 42 and 43 which connect the inner end of the opening 40 with the interior of the housing 22.

Provided through the inner wall of the enlargements 17 are openings 44, which openings have mounted in their outer ends suitable oil or grease fittings 45 and provide means for supplying lubricant to the bearings 18 and 19. Immediately adjacent to the outer sides of the bearings 19, axle 5 is exteriorly screw threaded and provided with nuts 46, which are adapted to bear against the outer face of the cone 47 of the bearing 19 and provide means for adjusting the position of said bearings 18 and 19 to compensate for wear and otherwise. Lock nuts 48 are provided which act as lock nuts to aid in maintaining the adjusted position of the nuts 46 and bearings 18 and 19. Any other or desired means may be provided to lock said nuts in their adjusted positions. Formed in the inner perimeter of the sockets 17 near the open ends thereof are recesses 49 adapted for the reception of the retaining washers 50 which serve to retain dust washers 51 positioned within the outer ends of said recesses and prevent the entrance of dust or other foreign matter into said recesses.

It will be understood that the housing 22 may be so constructed as to clamp tightly to the collar 8, or to rotate therearound as desired or found advisable, or as circumstances may warrant.

It will be noted that adjustment of the position of the outer bearings 18 and 19 will also automatically adjust the inner bearings 12, the means whereby this is done being obvious.

Rigidly mounted upon the outer periphery of the outer enlarged portions of the sleeves 13 and 14 are the traction wheels 52 and 53 which may be of any suitable or desired type and held positioned by friction or in any other desired manner.

It will be noted that sleeves 13 and 14 are so constructed and supported by bearings 12, 18 and 19, carried by axle 5, and protected by housing 22, which is held in place by collar 8, that there will be practically no necessity for replacement of said sleeves 13 and 14.

Having described my invention what I claim is:

1. The combination of a rotatable axle, a pair of rotatable sleeves mounted on said axle to surround the same, one at each end thereof, and means between said axle and sleeves for preventing relative lengthwise movement therebetween comprising an integral collar formed around said axle centrally of the length thereof and having an annular groove in the outer periphery thereof, and a longitudinally separable housing surrounding the inner ends of said sleeves and said axle collar and having an interior concentric tongue arranged to fit within the groove in said collar and prevent lengthwise movement between said housing and said axle.

2. The combination of a rotatable axle provided centrally of its length with a concentric enlargement forming a collar, said collar having a concentric groove in its outer periphery, a pair of rotatable sleeves surrounding said axle, one at each side of said collar, the ends of said sleeves terminating in enlarged portions and being provided with annular recesses adapted for the reception of anti-friction bearings, and a housing inclosing the enlarged inner ends of said sleeves and said collar and rotatable relatively thereto and being provided around its inner perimeter with a projecting tongue adapted to fit within the groove in said collar and prevent relative lengthwise movement between said axle and housing.

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