May 12, 1931. E. R. EDSON 1,804,600

GUARD WHEEL FOR SAFETY RAILWAY TRUCKS

Filed July 12, 1928

Fig. 1

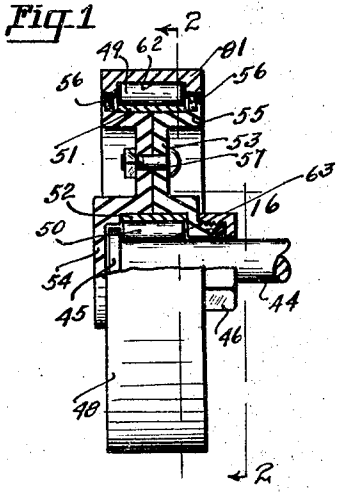


Fig. 2

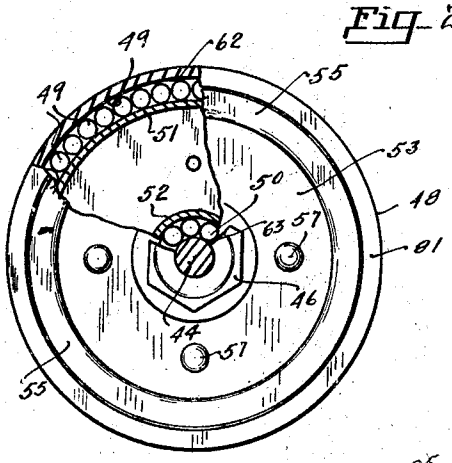


Fig. 3

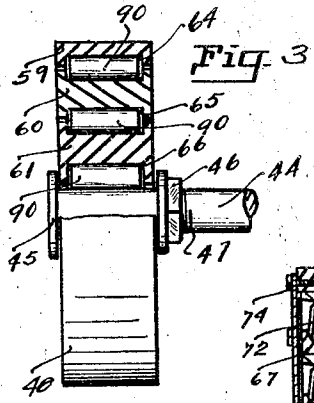


Fig. 5.

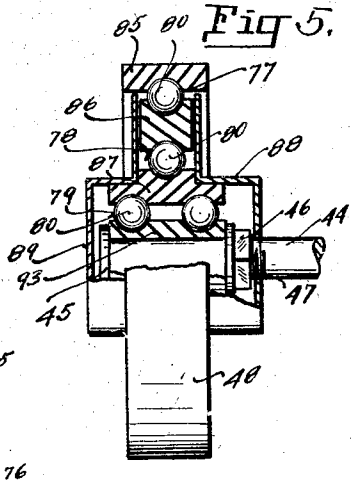
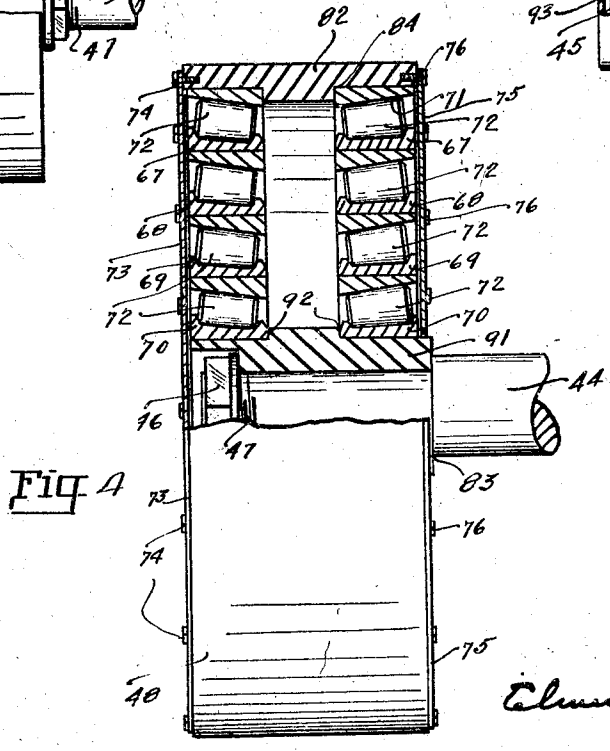


Fig. 4



INVENTOR

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Patented May 12, 1931 1,804,600

UNITED STATES PATENT OFFICE

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GUARD WHEEL FOR SAFETY RAILWAY TRUCKS

Application filed July 12, 1928. Serial No. 292,301.

My invention is concerned with improvements in the railway trucks now in common use, with the object of preventing derailment at high speeds, and is related to a group of U. S. patent applications which have been previously filed by me, some of them having been issued, as follows: Patent 1,612,271 on railway trucks and rails, issued Dec. 28, 1926; Patent 1,669,741 on switching devices, issued May 15th, 1928; Patent 1,669,742 on railway switches, issued May 15th, 1928; Patent 1,674,893 on railway roadbed and track construction, issued June 26th, 1928; pending application on railway cross-over, Serial Number 240,164, filed Dec. 15th, 1927; pending application on safety railway trucks, Serial Number 269,133, filed April 11th, 1928; pending application on railway roadbed and track construction, filed April 30th, 1928, Serial Number 273,960. It appears that all railway traffic will be materially speeded up in the near future, and that our express trains will travel at speeds of approximately 100 miles per hour. It is evident that anti-derailment devices will be necessary for all such high-speed railway vehicles, and the chief object of this invention is to prevent the trucks from leaving the tracks. A further object is to provide a suitable type of bearing for the safety wheels. It seems probable that the safety-wheels will be set from ½ to 1 inch below the safety-flange, so that when the train is running smoothly they will be idle. However, when the trucks jolt and lift a little, or round curves at high speeds, the safety-wheels will come into contact, suddenly, with the safety-flange. Now when a train is moving at a speed of 100 miles per hour, it would be impossible for a small safety-wheel to begin, at once, to rotate at proper speed unless some special provision were made to enable the wheel to revolve with the greatest of ease. Realizing this fact, I have devised a safety or guard wheel provided with multiple bearings, i. e. a bearing composed of two or more concentric systems of ball-bearings or roller-bearings, one inside the other. It is evident, in a case like this, that a contact of the face of the idling safety-wheel with the safety-flange would bring the outer bearing (next to the rim) into operation first of all. The middle bearing would next come into play, and lastly the inner bearing would operate. The result would be a distribution of work between the three sets of bearings, preventing a wearing away of the wheel-rim from friction, and also preventing the bearings themselves from overheating. Of course, while this multiple bearing is eminently fitted for the work required of a safety-wheel, yet it would be quite useful on any form of device revolving at superspeeds.

These objects are attained by the employment of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a view, partially cut away, of a duplex roller bearing.

Figure 2 is a view taken on the line 2—2 of Figure 1, looking in the direction indicated.

Figure 3 is a view, partially cut away, of a triple roller bearing.

Figure 4 illustrates a quadruple roller bearing, partially cut away to show the construction of the bearings.

Figure 5 shows a triple ball-bearing, with parts cut away as in Figure 4.

Similar reference symbols indicate similar parts in all the drawings.

In Figure 1, a bearing of the duplex type is shown. The face of the bearing appears at 48. Parts are cut away in the upper part of the drawing. The outer rim 81 is provided with a raceway 62 for seating the rollers 49, the inner half of the raceway being located in the inner rim 55 of webs 53. 51 is a wear-ring for the rollers 49. 56 is a dust-felt set in a ring-pocket in the inner rim 55. The webs 53 are secured together by bolts 57, or by other suitable fastening means. The inner raceway 63 is located in the hub 54, and is provided with a wear-ring 52 for the rollers 50 to bear on. The entire bearing is retained upon the shaft 44 by a flange 45. 46 is a lock-nut retaining the packing 58.

Figure 2 is a vertical sectional view taken on the line 2—2 of Figure 1, showing the outer raceway 62 with rollers 49, and the inner

raceway 63 with its rollers 50, as well as other similar parts illustrated in Figure 1.

Figure 3 shows a triple roller bearing having three concentric rings 59, 60 and 61, with the three raceways 64, 65 and 66 for the rollers 90. The entire bearing is secured to the shaft 44 by an end-flange 45 and the lock-nut 46 which screws up on the thread 47 to proper position.

Figure 4 illustrates a doubled quadruple bearing of the cup and cone type. In this figure, the rim 82 is provided with a shoulder 84, and the spindle 91 is also provided with a shoulder 92. Standard tapered roller bearings units 67 are now pressed firmly inside the rim 82 from each side until each reaches the shoulder 84. The cups in these bearings are shown at 71, and the cones at 72. A similar roller bearing unit 68 is now pressed inside of bearing 67. Bearing 69 is pressed inside of bearing 68. Lastly, bearing 70 is pressed inside of bearing 69 until it meets the shoulder 92 on the spindle 91 set on the shaft 44. The entire bearing is securely fastened to the shaft 44 by tightening the lock-nut 46 on the thread 47 until the spindle is locked against the shoulder 83 on shaft 44. The outer surface of the bearing is protected by the dust-plate 73 which is secured by bolts 74, and the inner surface is similarly covered by the dust-plate 75 secured to the bearing by the bolts 76.

Figure 5 shows one form of construction of a triple ball bearing. The outer raceway 77 and balls 80 are located between the rim 85 and the ring 86. A middle raceway 78 and balls 80 are located between the ring 86 and the ring 87. Again, two raceways 79 are located between the ring 87 and the spindle 93. The entire bearing is secured on the shaft 44 by tightening the lock-nut 46 on the thread 47 until the spindle is firmly locked against the flange 45.

It will be seen that these concentrically multiple bearings have two functions: First, they permit an idling wheel to almost instantaneously acquire a high speed of rotation by means of frictional contact with a tread along which the wheel is travelling. Secondly, they reduce the friction in a bearing, permitting very high speeds of rotation, and also prolonging the life of the bearing.

Having given this description of the several parts of my invention, I make the following claims:—

1. A guard wheel for high speed railways, comprising an annular member constituting a rim, said rim having a transversely flattened outer surface and an endlessly recessed inner surface, a pair of complementary webs within said rim, said webs having circumferentially an endless recess complementing the aforesaid recess in said rim, revolving bearings within said recesses, said webs having a hub provided with an endless recess, and revolving bearings within the last mentioned recess.

2. A guard wheel for high speed railways, comprising an annular member constituting a rim, said rim having a transversely flattened outer surface and an endlessly recessed inner surface, a pair of complementary webs within said rim, said webs having circumferentially corresponding offset portions designed to provide an endless recess complementing the aforesaid recess in said rim, revolving bearings in said recesses, said webs having a hub provided with an endless recess, and revolving bearings carried within the last mentioned recess.

3. In a wheel of the character described, a pair of annular webs held together, said webs formed to provide a circumferential recess, an annular member constituting a rim, said rim being provided with a recess facing the first mentioned recess, said recesses constituting a raceway for revolving bearings, and said webs having a hub for revolution about an axle.

4. The construction set forth in claim 3 with the inclusion of a recess for revolving bearings in the aforesaid hub.

ELMER R. EDSON.