Dec. 14, 1926. 1,610,884

W. ROBERTSON

TROLLEY

Filed Nov. 6, 1924 4 Sheets-Sheet 1

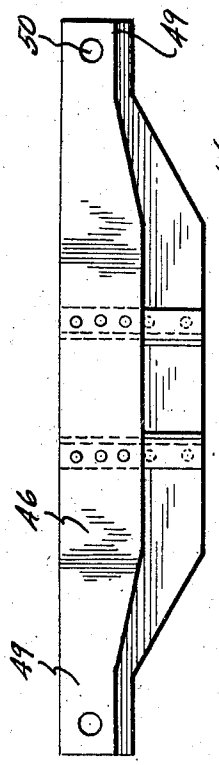


Fig. 12

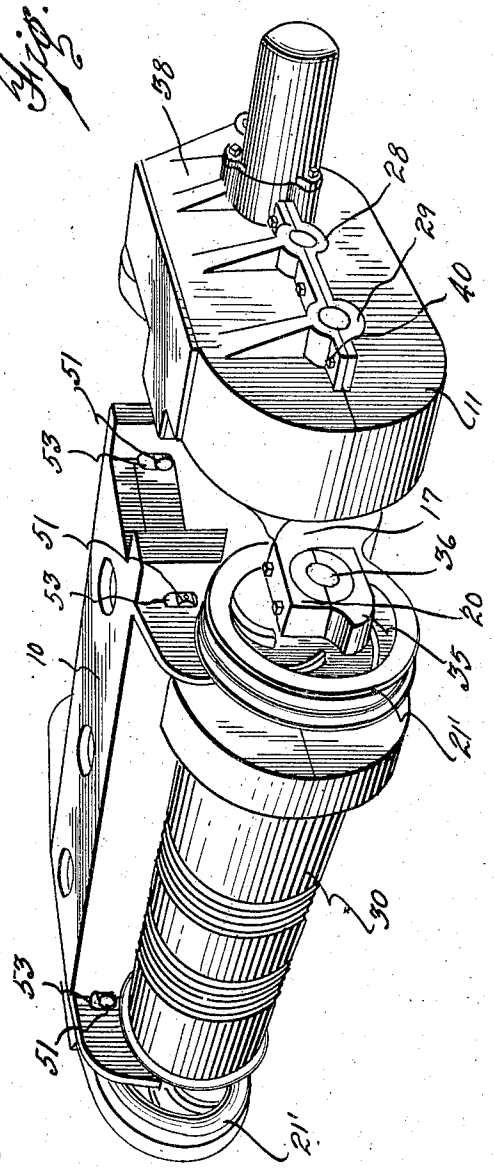


Fig. 1

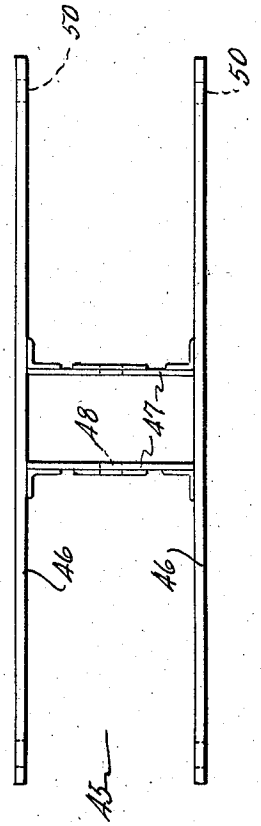


Fig. 11

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TROLLEY

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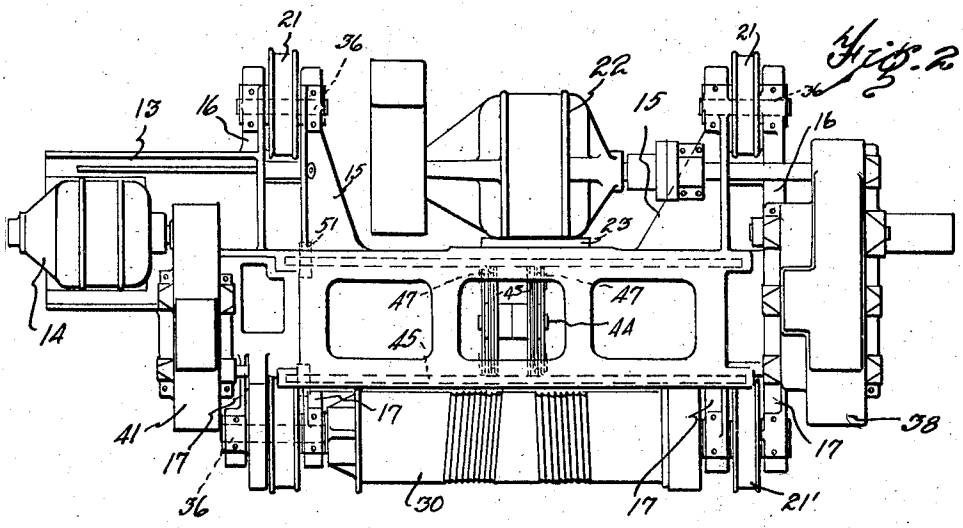


Fig. 2

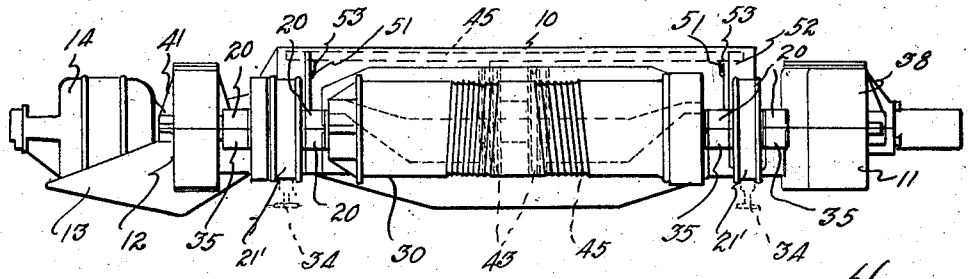


Fig. 3

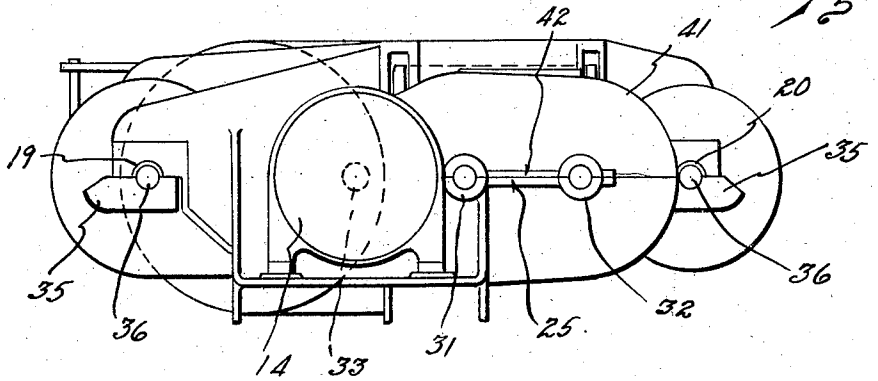


Fig. 5

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TROLLEY

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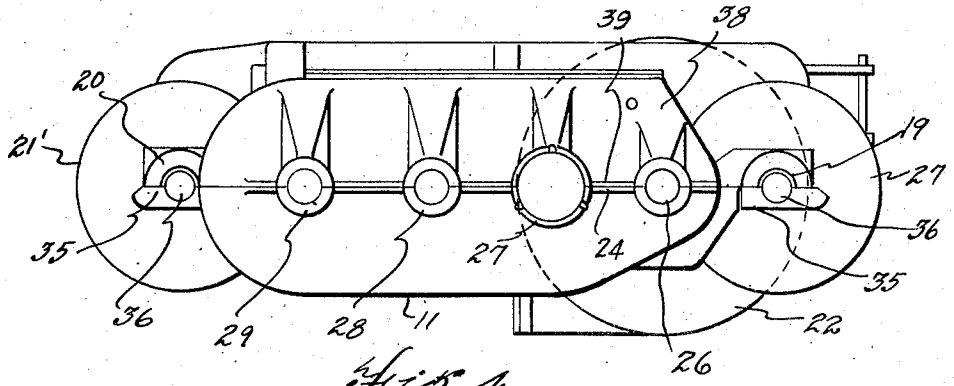


Fig. 4

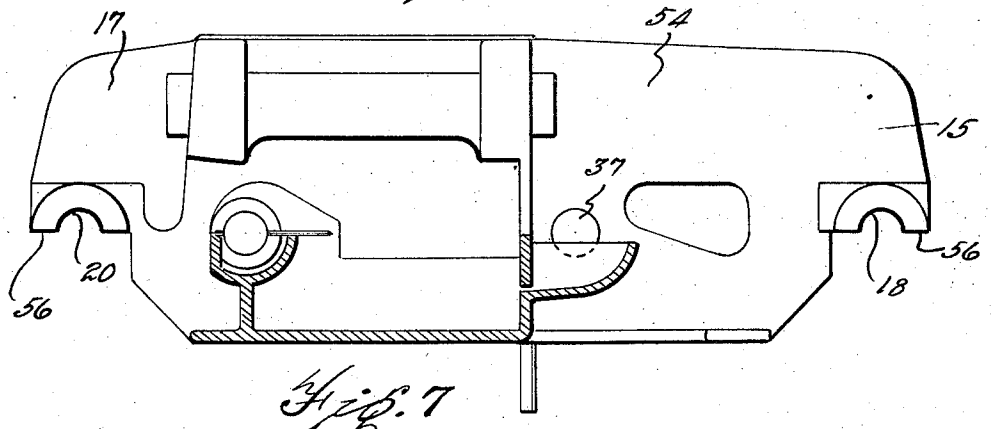


Fig. 7

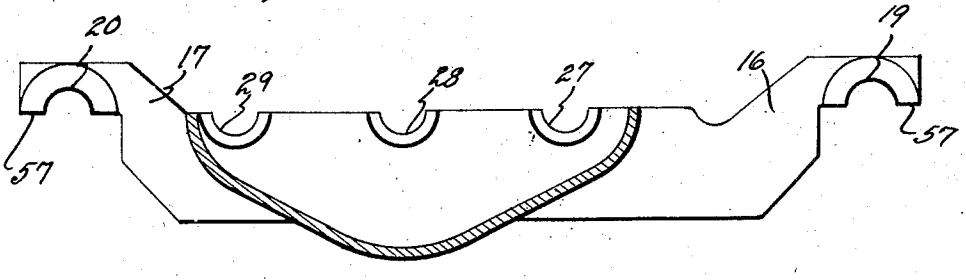


Fig. 8

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TROLLEY

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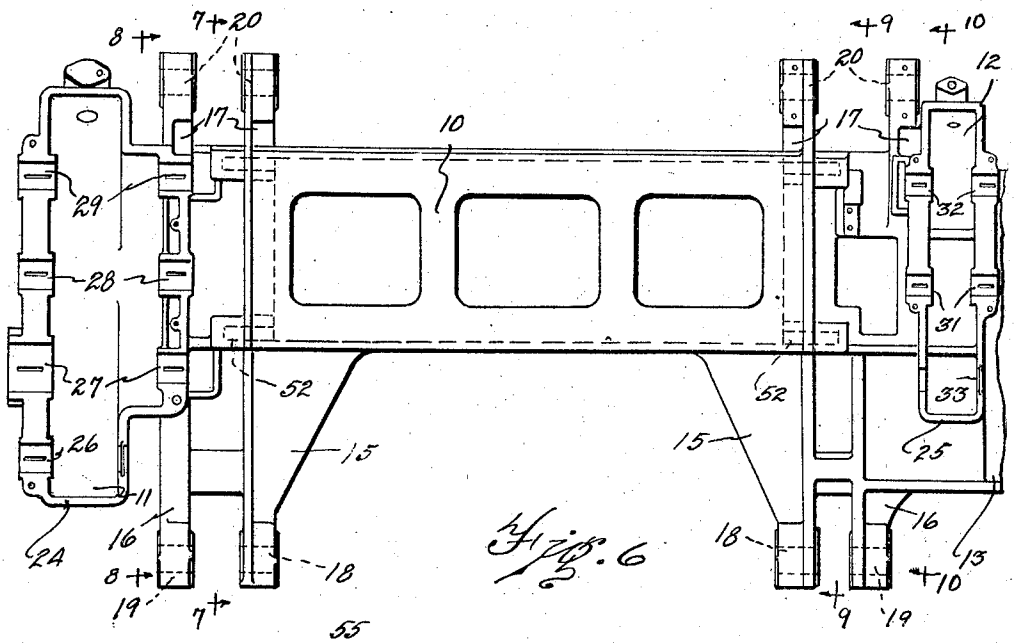


Fig. 6

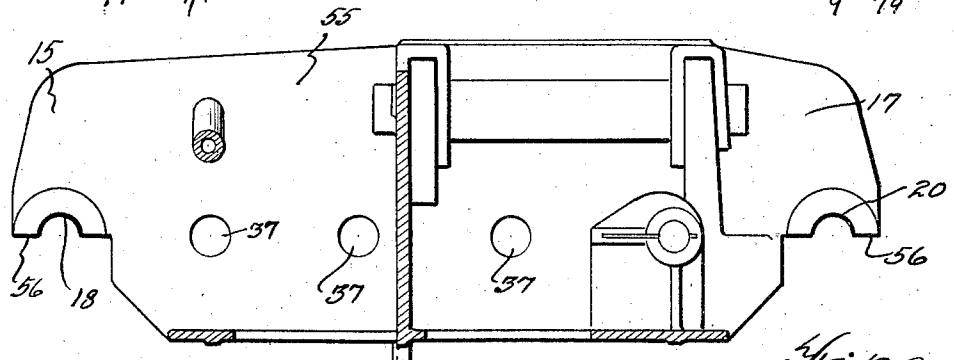


Fig. 9

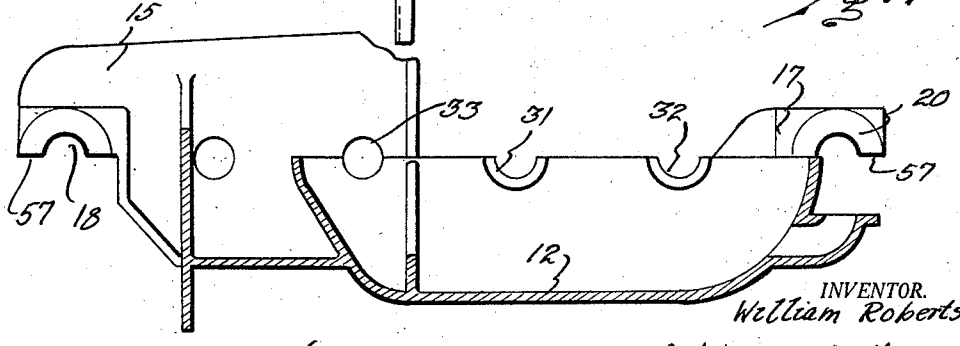


Fig. 10

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UNITED STATES PATENT OFFICE.

WILLIAM ROBERTSON, OF DETROIT, MICHIGAN, ASSIGNOR TO NORTHERN ENGINEERING WORKS, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

TROLLEY.

Application filed November 6, 1924. Serial No. 748,299.

The invention relates to trolleys and has among its objects to provide a trolley of simple and strong construction capable of being manufactured at a low cost. Another object is to provide a method of manufacturing trolleys which will involve a minimum number of steps. A further object is to provide a trolley constructed of a unitary casting having the gear and wheel bearing centers lying in a common plane with certain of the bores in alignment. A further object is to provide a trolley of compact design affording low head room with all the working parts positioned above the bridge rails. Another object resides in the provision of a safety construction whereby the trolley frame is relieved from strains incident to an overtravel of the hoisting element.

With these and other objects in view, the invention resides in the novel features of construction and combination and arrangements of parts as more fully hereinafter described and claimed.

Referring to the drawings which are made a part hereof and in which similar reference characters indicate corresponding parts:

Figure 1 is a perspective view showing the hoist end of the trolley;

Figure 2 is a plan view of the trolley;

Figure 3 is an elevation view of Figure 2;

Figure 4 is an elevation view of the hoist end of the trolley shown in Figure 2;

Figure 5 is an elevation view of the rack end of the trolley shown in Figure 2;

Figure 6 is a plan view of the main frame of the trolley;

Figure 7 is a sectional view along the line 7—7 of Figure 6;

Figure 8 is a sectional view along the line 8—8 of Figure 6;

Figure 9 is a sectional view along the line 9—9 of Figure 6;

Figure 10 is a sectional view along the line 10—10 of Figure 6;

Figure 11 is a plan view of the load girt, and

Figure 12 is an elevation view of the load girt.

In the drawings reference character 10 indicates the main frame of the trolley. Integrally cast with the frame 10 are the end gear casings 11 and 12 respectively. The frame 10 is also formed with the projection 13 forming a support for the motor 14 and projections 15, 16 and 17 forming bearings 18, 19 and 20 respectively for trolley wheels 21, 21′. Motor 22 is supported by the main frame at 23.

The gear casings 11 and 12 are provided with upper surfaces 24, 25 respectively lying in a common plane. The gear casing 11 is provided with semi-circular bearing portions 26, 27, 28 and 29. These bearing portions accommodate gear shafts carrying gears for transferring energy from the motor 22 to the drum 30.

Gear casing 12 is provided with semi-circular bearing portions 31, 32, 33 accommodating gear shafts carrying gears for transferring energy from the motor 14 to trolley wheels 21′ whereby the trolley is driven along bridge rails 34 supporting the trolley wheels 21, 21′ as shown in Figure 3.

Bearing caps 35 are adapted to be bolted to the complementary trolley wheel bearings 18, 19, 20 for the trolley wheel shafts 36.

The centers of the bearing portions of the gear casings 11 and 12 and the trolley wheels 21 are adapted to lie in a common plane, certain of the bearings being aligned as 27, 33; 18, 19; 28, 31; 29, 32; and 20, 20.

Openings 37 are provided in the webs of the main frame 10 when needed to accommodate the travel of the tool in boring the aligned bearings in a single operation. Proper relationship between all bearings is maintained by reason of the integrally cast gear casings and main frame. The surfaces 24, 25 of the gear casings are cast in the same plane whereby both of these surfaces may be machined in one operation without changing tthe adjustment of the tool or casting. Such machining insures exact alignment of the bearings and proper contact and relationship of the gears and trolley wheels.

A cap 38 is provided for the gear casing 11, the cap having semi-circular bearing portions corresponding to those of the gear casing. The surface 39 of the cap is adapted to contact with the surface 24 of the gear casing and the parts bolted together as at 40.

Cap 41 is likewise provided with semi-circular bearing portions corresponding to those of the gear casing 12 to which it is bolted, the surface 42 of the cap contacting with the surface 25 of gear casing 12.

Sheaves 43 receive the hoisting cables from drum 30. The sheaves are mounted on a

shaft 44 journaled in the load girt 45 shown in Figures 11 and 12. The load girt comprises longitudinally extending bars 46 and cross bars 47 journalling sheave shaft 44 at 48. The ends 49 of the bars 46 are provided with openings 50 adapted to accommodate pins 51. Pockets 52 are formed in the main frame 10 and are adapted to receive the ends 49 of the load girt 45. The pockets are provided with vertical slots 53 of sufficient width to accommodate the pins 51. Normally the load girt 45, carrying the greater portion of the load by reason of the sheaves 43, is suspended or floated on the pins 51 which are supported in the bottom of the slots 53 of pockets 52. The load girt is not therefore normally in supported contact with the main frame 10 except through the pins 51. However, should the drum 30 overtravel to cause the load to bear upwardly against sheaves 43, around which the load supporting cable is being passed in its travel to the drum 30, the upward pull on the sheaves 43 will raise the load girt 51 with the load, pins 51 being guided upwardly in the slots 53. The trolley frame is thus relieved of any sudden shock caused by an overtravel of the load. The weight of the load girt and the strain on the motor 22 due to the overtravel will gradually increase the load on the motor to avoid any injurious sudden stresses and strains in the trolley frame.

As shown in Figures 7 and 9 the webs 54 and 55 respectively reinforce the main frame of the trolley in the plane of the supporting trolley wheels, the webs being formed with overhanging bearing portions 18 having surfaces 56 lying in the plane of the surfaces 24, 25 of the gear casings whereby the surfaces may be machined in a single operation without relatively adjusting the tool and main frame.

As shown in Figures 8 and 10 the gear casings are likewise provided with overhanging bearing portions 19 and 20 having surfaces 57 lying in the plane of surfaces 56. The bearings 18, 19 and 20 open downwardly whereby the weight of the load and trolley frame is supported by the projections 15, 16 and 17. Gear casings 11 and 12 open downwardly from their upper surfaces 24 and 25.

It will be noted that the trolley embodying the foregoing features of my invention affords a very rigid structure, easily machined and readily assembled. Accurate alignment of all shafts is maintained by reason of the unitary structure and a reduced number of steps is involved in the manufacture of the trolley by reason of the aligned bores of the gear casings and trolley wheels having their surfaces in a common plane. A further advantage derived from the invention resides in the manner in which the various shafts are located in a common plane thereby affording unusually low head room permitting location of the trolley close to the ceiling. All the gears and shafts are also readily accessible for inspection or repair from above the trolley. A further important feature of the invention resides in the provision of the load girt floated on supporting pins in order to absorb the shock of overtravel of the load.

While it is believed that from the foregoing description, the nature and advantages of my invention will be readily understood, I desire to have it understood that I do not limit myself to what is herein shown and described and that such changes may be resorted to when desired as fall within the scope of the claims.

What I claim as my invention is:—

1. In a trolley, a unitary casting comprising a main frame and a gear casing said gear casing having a surface formed with bearing portions, a plurality of trolley wheels for supporting the trolley, bearing portions for said trolley wheels carried by said casting, the surfaces of said trolley wheel bearing portions and the said surface of the gear casing lying in substantially the same plane, said gear casing and bearing portions opening in opposite directions.

2. In a trolley, a unitary casting comprising gear casings presenting upper surfaces lying in a common plane and opening upwardly therefrom and trolley wheel bearing portions having surfaces lying substantially in said plane and opening downwardly therefrom.

3. In a trolley frame, a gear casing having a surface formed with a plurality of bearing portions, a plurality of trolley wheels for supporting the trolley, bearing portions for said trolley wheels carried by the frame and having surfaces lying in the plane of the said gear casing surface, the bearing portions of the gear casing and trolley wheels opening in opposite directions.

4. In a trolley frame, a plurality of trolley wheel shafts and trolley wheels therefor, a unitary casting comprising a main frame having a plurality of trolley wheel bearing portions adapted to contact with the upper semi-circumferences of the trolley wheel shafts and presenting surfaces extending below the upper portion of the trolley wheel shafts, a gear casing cast with the main frame and having a surface formed with a plurality of bearing portions and lying in the plane of the said surfaces of the trolley wheel shafts the bearing portions of the trolley wheel shafts and gear casing opening in opposite directions.

5. In a trolley, a plurality of trolley wheel shafts, trolley wheels therefor, and a trolley frame formed with a plurality of trolley wheel shaft bearing portions overhanging the shafts to support the trolley frame, said

frame being formed with a gear casing presenting a surface formed with a plurality of bearing portions, said surface lying substantially in a horizontal plane containing the trolley wheel shafts.

6. In a trolley, a unitary casting comprising a main frame and a gear casing said gear casing having a surface formed with bearing portions, a plurality of trolley wheels for supporting the trolley, bearing portions for said trolley wheels carried by said casting, the surfaces of said bearing portions and gear casing lying in substantially the same plane, said gear casing and bearing portions opening in opposite directions.

7. In a trolley, a unitary casting comprising gear casings presenting upper surfaces lying in a common plane and opening upwardly therefrom, and trolley wheel bearing portions having surfaces lying substantially in said plane and opening downwardly therefrom, gears within said casings and trolley wheels adapted for mounting in said trolley wheel bearings whereby the trolley wheels and gears have their axes lying in substantially the same horizontal plane to afford low head room for the trolley.

8. A trolley comprising a main frame having bearings formed on the underside of said frame and adapted to receive wheel carrying axles, and bearings formed on the top of said frame and adapted to receive shafts of the operating mechanism of the trolley, the axes of the axles and shafts lying substantially in the same plane affording low head room for the trolley.

9. A trolley comprising a main frame and provided in its upper portions with gear casings adapted to receive gears or the like of the operating mechanism of the trolley, journal boxes formed on top of the frame adjacent to said gear casings for receiving the shafts supporting said gears or the like, and journal bearings formed on the underside of said frame for receiving wheel carrying axles, the axes of said shafts and axles lying substantially in the same plane so as to present a compact arrangement of the gears or the like and the wheels of the trolley affording low head room.

10. A trolley comprising a main frame and provided in its upper portions with gear casings adapted to receive gears or the like of the operating mechanism of the trolley, journal boxes formed on top of the frame adjacent to said gear casings for receiving the shafts supporting said gears or the like, journal bearings formed on the underside of said frame for receiving wheel carrying axles, the axes of said shafts and axles lying substantially in the same plane so as to present a compact arrangement of the gears or the like and the wheels of the trolley affording low head room, and gear casing caps removably secured in position above the gear casings.

11. A trolley comprising a main frame having a group of bearings formed on the underside of said frame, and a group of bearings formed on the top of said frame, one of said groups of bearings being adapted to receive wheel carrying axles and the other of said groups of bearings being adapted to receive shafts of the operating mechanism of the trolley, the axes of the axles and shafts lying substantially in the same plane affording low head room for the trolley.

In testimony whereof I affix my signature.

WILLIAM ROBERTSON.