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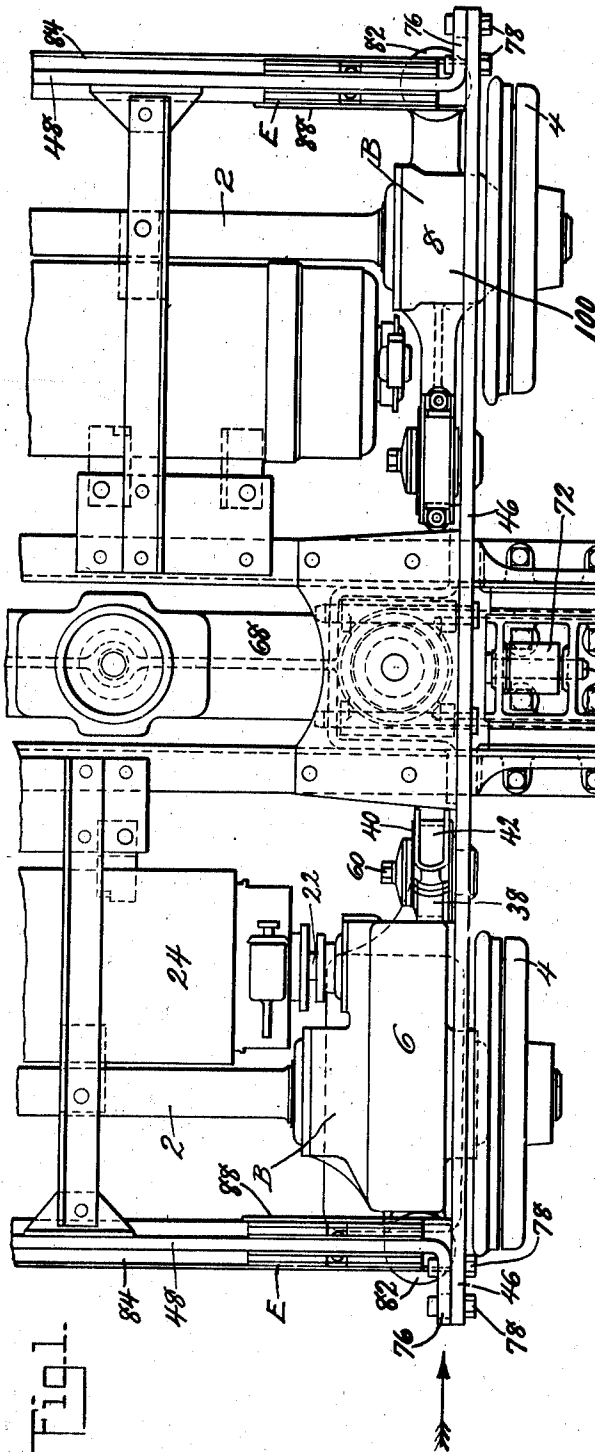
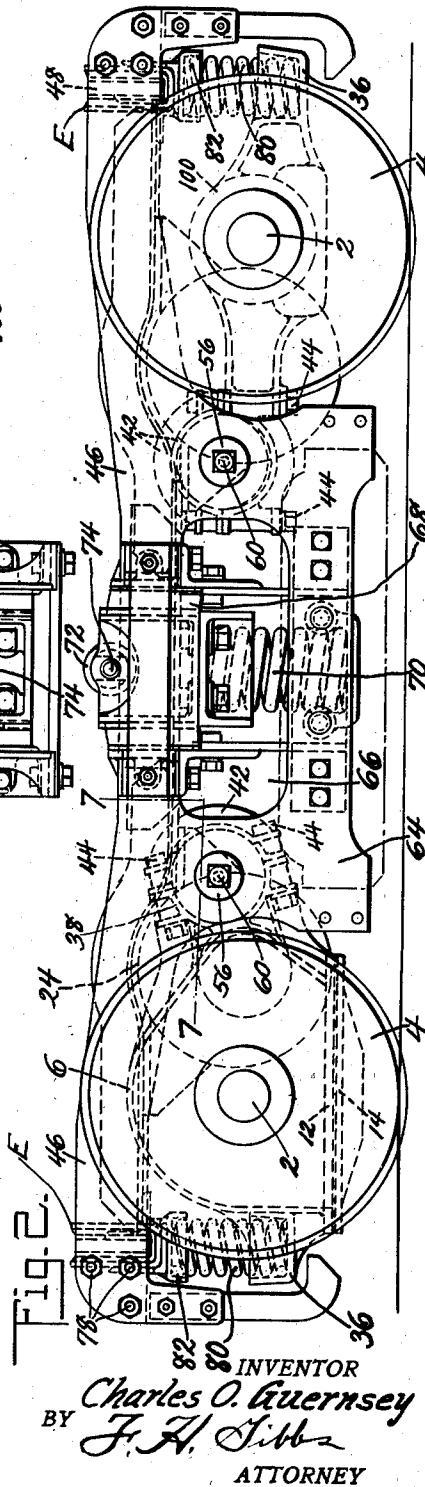
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2,289,423

RAILWAY CAR TRUCK

Filed Dec. 30, 1933

5 Sheets-Sheet 1



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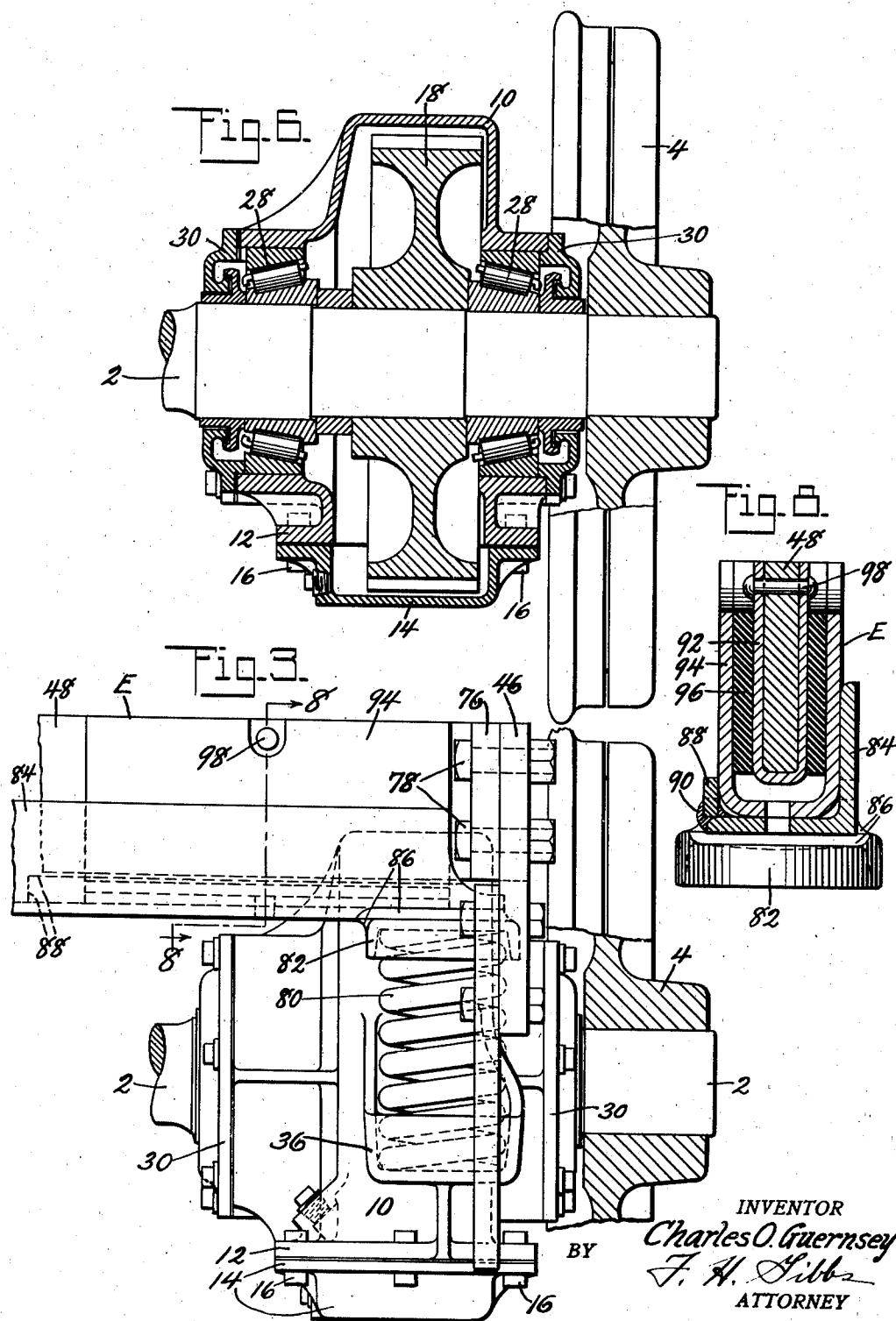
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RAILWAY CAR TRUCK

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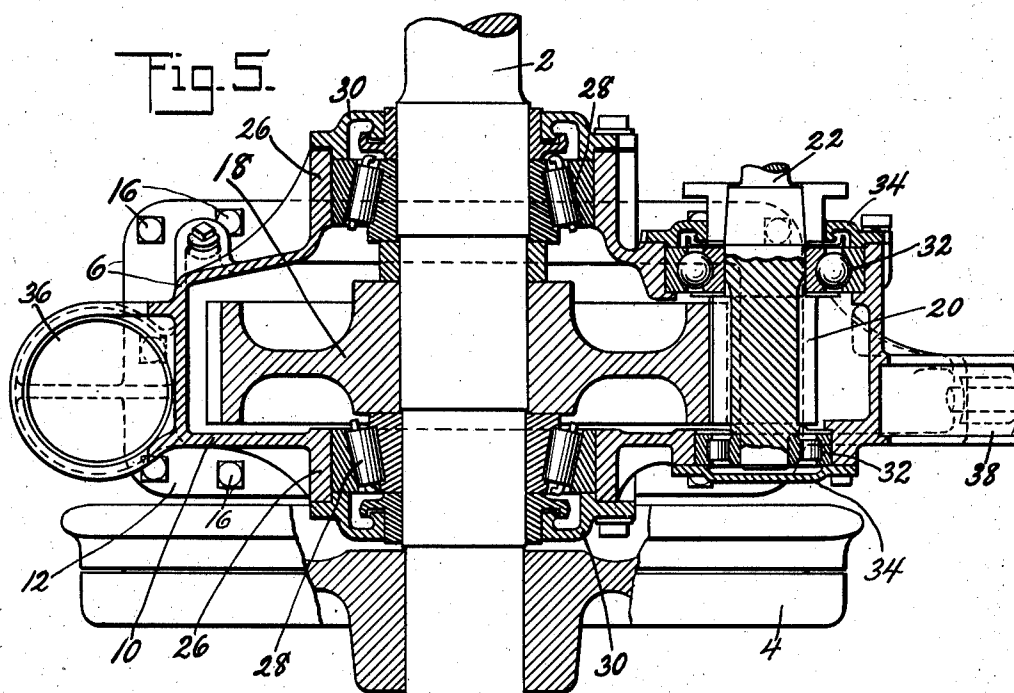
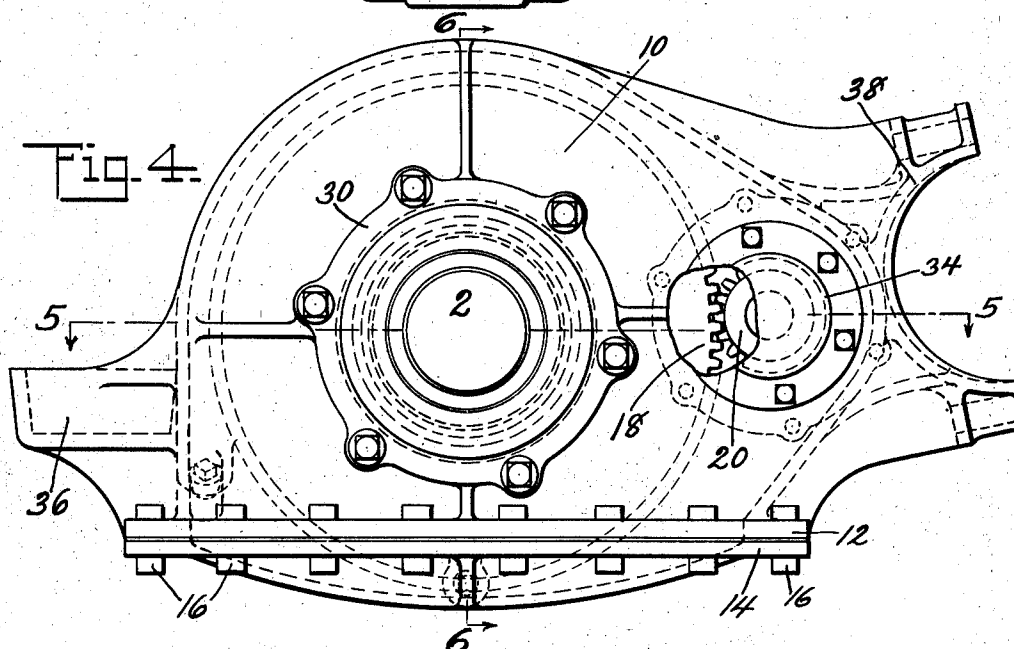
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RAILWAY CAR TRUCK

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5 Sheets-Sheet 3



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Fig. 9.

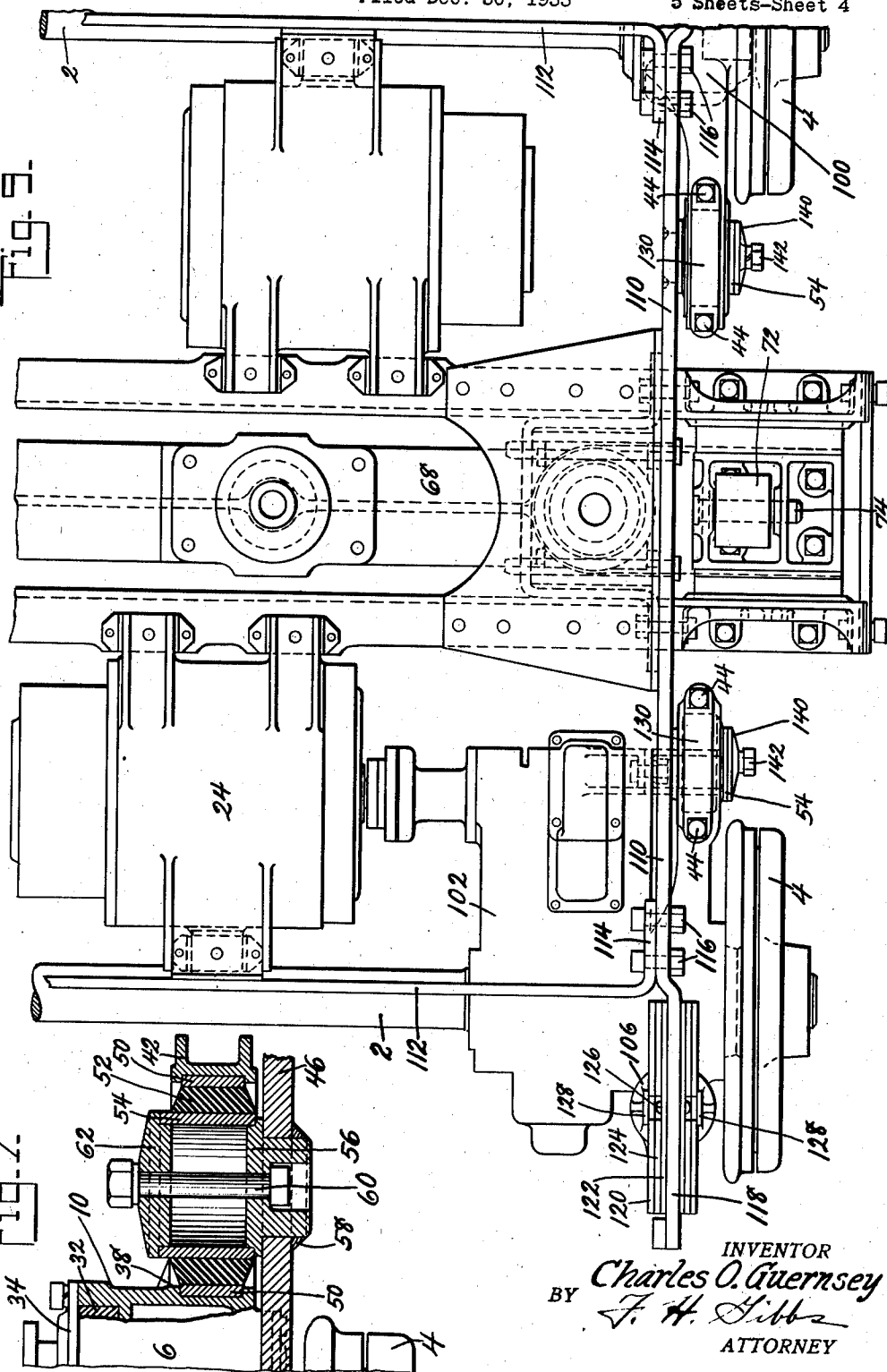


Fig. 7.

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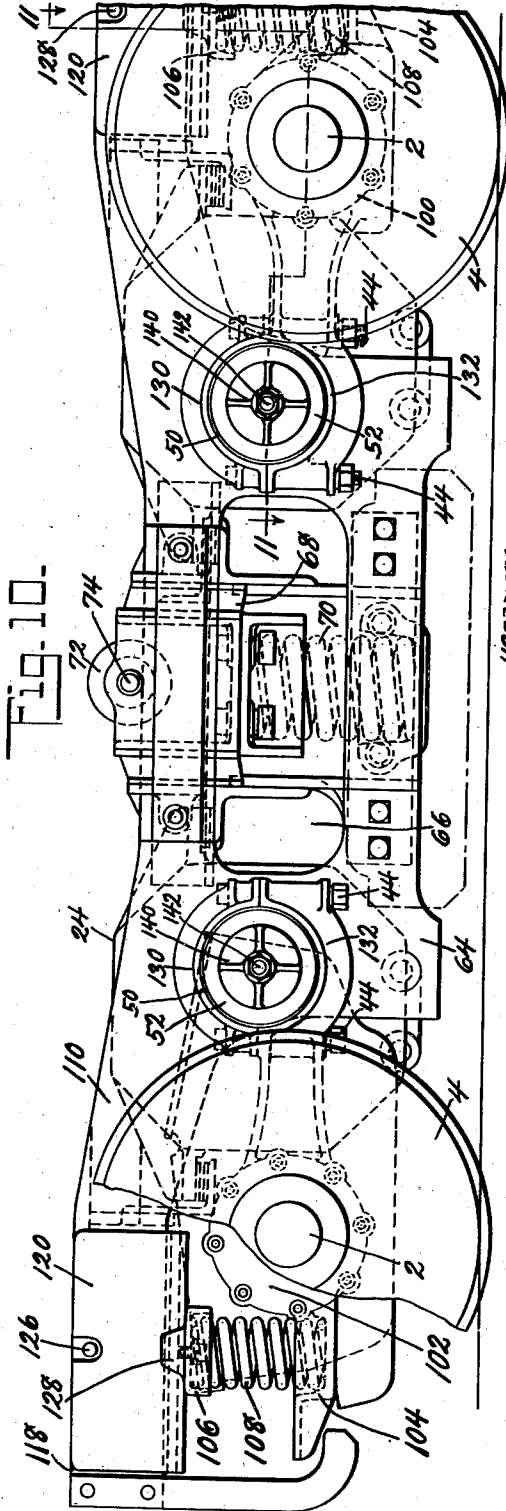
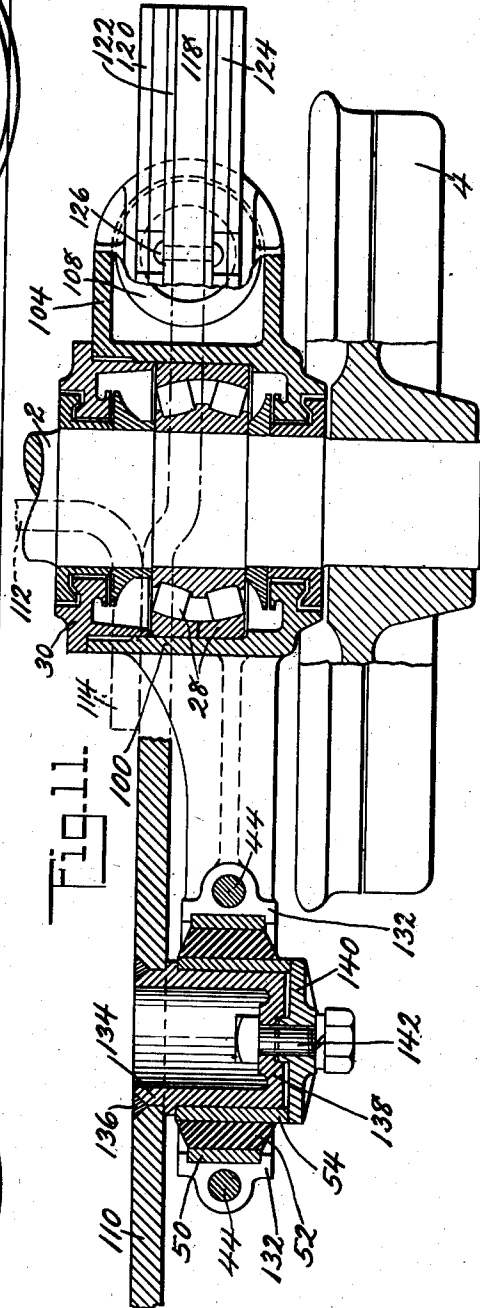
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RAILWAY CAR TRUCK

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2,289,423

RAILWAY CAR TRUCK

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Application December 30, 1933, Serial No. 704,612

17 Claims. (Cl. 105—182)

This invention relates generally to railway car trucks and has for one object a new and improved means for supporting the truck frame.

Another object of this invention is the provision of a new and improved journal box for railway car trucks.

Still another object of this invention is the provision of a railway car truck in which the side and end frames thereof are supported by elastic material which in service is subject to shearing action.

A further object of this invention is the provision of a new and improved journal box mounting for railway car trucks.

This invention also contemplates a journal box mounting including elastic material which in service is subject to shearing action.

Another object of this invention is the provision of an electric railway car truck having a combined journal box and gear housing connected with the truck frame through the medium of elastic material acting in shear.

The present invention also provides a railway car truck which is formed of relatively light material for the side and end frames, the side and end frames being supported by resilient members acting in shear.

A still further object of this invention is the provision of a railway car truck which is so formed that track noises and vibrations are not transmitted to the side and end frames thereof.

Another object of this invention is the provision of a railway car truck the side and end frames of which are resiliently supported by elastic material acting in shear whereby to reduce and substantially eliminate the transmission of impact shocks from the wheels to said members.

Still another object of this invention is the provision of a railway car truck the frame members of which are formed of relatively light material so connected that there is substantially no metal to metal frictional engagement of parts whereby to provide a truck which is substantially silent in operation and in which wear of the parts forming said truck is reduced to a minimum.

Other objects and advantages of this invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which:

Figure 1 is a fragmentary top plan view of a truck showing one form of the present invention;

Fig. 2 is a side elevation of the truck shown in Fig. 1;

Fig. 3 is an enlarged detail view of a portion

of the truck shown in Figs. 1 and 2, the view being taken in the direction of the arrow, Fig. 1;

Fig. 4 is a side elevation view of the combined journal box and gear housing of the truck shown in Figs. 1 and 2, certain parts being broken away;

Fig. 5 is a sectional view on the line 5—5, Fig. 4;

Fig. 6 is a sectional view on the line 6—6, Fig. 4;

Fig. 7 is a detail sectional view of a portion of the truck shown in Figs. 1 and 2, the view showing the connection of the combined gear housing and journal box to the side frame; the view being taken on the line 7—7, Fig. 2;

Fig. 8 is a sectional view through the end frame of the truck shown in Figs. 1 and 2 showing the assembly of the end frame and spring cap, the view being taken on the line 8—8, Fig. 2;

Fig. 9 is a fragmentary top plan view of a modified form of truck;

Fig. 10 is a side elevation of the truck shown in Fig. 9, certain parts being broken away; and

Fig. 11 is a sectional view on the line 11—11, Fig. 10.

Referring now more particularly to the drawings and with specific reference to the truck shown in Figs. 1 and 2, it can be seen that the truck includes axles 2 which are arranged in journal boxes indicated generally at B and are supported by wheels 4, the latter, in the instance shown, comprising a split tread portion and conforming to the wheel shown in my co-pending application, Serial No. 704,611, filed December 30, 1933.

The disclosure of the specific type of wheels is merely by way of example as obviously the wheels may be of any preferred or desired form. One of the journal boxes for each axle comprises a combined reduction gear housing and journal box 6 while the opposite journal box does not include a gear housing and is indicated in Fig. 1 at 8.

As more clearly shown in Figs. 3 to 6, inclusive, the combined gear housing and journal box 6 comprises a main body portion 10 which is open at its lower end and provided with an attaching flange 12 to secure a bottom cover plate 14 by suitable fasteners such as the bolts 16. The body portion 10 is so formed as to provide a housing for a reduction gear 18 secured to the axle 2 and arranged in meshing relation with a pinion 20 arranged adjacent thereto and secured to the end portion of a drive shaft 22 driven

by a motor 24 supported by truck frame members in any suitable or desired manner. The body portion 10 is provided with oppositely arranged bosses 26 in which bearing assemblies 28 are arranged in which the axles 2 are rotatable. Surrounding the axles 2 and secured to the bosses 26 are cover plates 30, all as clearly shown in Figs. 3 to 6, inclusive. The body portion 10 of the combined gear housing and journal box 6 is also provided with bearing assemblies 32 in which the drive shaft 22 is rotatable, the bearing assemblies being protected by covers 34.

Formed at one end portion of the combined gear housing and journal box 6 (the rear end portion), is a cup-shaped spring seat 36. The opposite end portion of the element 6 is formed to provide one portion 38 of a clamp 40, the other portion of which is indicated at 42 and is connected to portion 38 by suitable fasteners such as the bolts 44.

The truck of the present invention includes side and end frame members 46 and 48, respectively, in the form of plates and as clearly shown in Fig. 7 the clamp elements 38 and 42 hold an annular bushing 50 to which rubber or other elastic material 52 in the form of an annulus is vulcanized, the rubber 52 being also vulcanized to a concentrically arranged bushing 54 engaged with boss 56 extending through the side frame 46 and welded to the latter as shown at 58. Clamped to the internal bushing 54 by means of a bolt 60 extending therethrough and through boss 56 is a retainer 62 which serves to prevent rotation of the bushing 54 as will be obvious. In the form of the invention shown in Figs. 1 and 2 the combined gear housing and journal box 6 is arranged adjacent the inner surface of the side frame 46 (see Fig. 1) and the support therefor as shown in Fig. 7 projects inwardly of the side frame 46.

The truck frame includes the before-mentioned side and end frame members 46 and 48, the former having a depending portion 64 between the wheels 4 and provided with an enlarged central opening 66 through which the bolster 68 projects as more clearly shown in Figs. 1 and 2. The bolster is supported by suitable springs 70 and a side bearing in the form of a roller 72 is provided which is supported on a pin 74. Inasmuch as the present invention is directed primarily to the truck frame and the supporting of the journal boxes and combined gear housing and journal boxes no further description of the bolster supporting arrangement is believed to be necessary.

As clearly shown in Fig. 1 the end portions of the end frames 48 are flanged as at 76 and secured to the end portions of the side frames 46 by suitable fasteners 78. The truck frame members are supported by means of springs 80 interposed between the spring seats 36 and spring caps 82, the spring caps on opposite sides of said truck frame being connected; in the instance shown the connection comprising an angle 84 welded to the spring caps 82 at 86 and having a retainer 88 welded to the edge portion of the horizontal flange of the angle as shown at 90, the retainer 88 and the vertical flange of the angle 84 providing a guiding channel at each end portion of the connection 84 into which a generally resilient end frame supporting member E extends to bear upon the horizontal flange of the connection 84.

As shown more clearly in Fig. 8 the supporting member E comprises inner and outer U-shaped

plates 92 and 94, respectively, between which are rubber strips 96 or other suitable elastic material. In practice the rubber 96 is vulcanized or otherwise secured to the channels 92 and 94. The inner channel 92 receives the end frame 48 and is connected to the latter by suitable fasteners such as the rivet 98. In practice the inner channel 92 closely fits the end frame member 48 as clearly shown in Fig. 8.

While the drawings illustrate the connection between opposite spring caps 82 as comprising an angle it will be apparent that within the spirit of the present invention a channel member may be used for connecting the caps 82 and thus eliminate the necessity for welding a separate piece such as 88 to form the guiding channel for the end frame supporting element E.

At the opposite end of the axle 2 from that at which the combined gear housing and journal box is provided the journal box is not combined with a gear housing but comprises only the body portion 100; the remaining elements of the journal box being similar to those described hereinbefore and hence bearing the same reference characters.

Referring now to the form of the invention shown in Figs. 9 to 11, inclusive, the axles 2 are driven through double reduction gearing 102 which is so formed as to provide a combined gear housing and journal box. In this form of the invention the body portion of the combined journal box and gear housing is provided with a spring seat 104 and interposed between said spring seat and a spring cap 106 is a coil spring 108. The side and end frames in the form of the invention shown in Figs. 9 to 11 are indicated at 110 and 112, respectively, the latter being flanged as at 114 and connected at 116 to the side frames. In this form of the invention the side frames project beyond the end frames as indicated by portions 118 and for supporting the truck frame on springs 108, inner and outer U-shaped members 120 and 122 are provided between which is rubber or other elastic material 124 vulcanized to each of said U-shaped members in a manner similar to that shown and described with reference to Fig. 8. The projecting portions 118 of side frames 110 are fitted in the inner U-shaped members 122 and are connected thereto by suitable fasteners such as the rivets 126. The combined inner and outer U-shaped members and the rubber vulcanized thereto constitute the supporting means for the truck frame members and as clearly shown in Fig. 10 they rest upon the spring caps 106, the latter being provided with retaining flanges 128 which extend upwardly along opposite sides of the outer U-shaped member 120 as shown in Fig. 9. In this form of the invention the journal box is resiliently connected at its opposite end portion to the outer side of the side frame member 110 as shown clearly in Figs. 9 and 11. The means which resiliently clamp the journal box to the side frame member 110 is very similar to that shown and described with reference to Fig. 7 and hence the same reference characters are applied. However, in the form of the invention shown more clearly in Fig. 11 the clamp comprises upper and lower members 130 and 132, respectively, the latter being formed integral with the journal box and the clamp being, in reality, split horizontally. The boss in Fig. 11 is indicated at 134 extending through the side frame 110 from the outer side thereof and being welded to said side frame as shown at 136. The boss is

hollow and is provided with a head portion 138 by which the retainer 140 is secured in clamping engagement with the inner bushing 54 by means of a bolt 142.

From the above description it can be seen that the truck frame comprising the side and end members 46 and 48, Fig. 1, or 110 and 112, of Fig. 9, is supported by elements which are, in effect, lever constructions. In the construction shown in Figs. 1 and 2 each lever comprises a main body portion constituting a journal box in one instance and a combined gear housing and journal box in the other instance, one end portion of the lever being resiliently connected to the side frame by means including an elastic medium in shear, and the opposite end of the lever being provided with a resilient element such as a spring for supporting the frame members. It is to be noted that in service movement of the truck frame relative to the wheels is resisted by rubber or other elastic material acting in shear. Any movement of the journal box relative to the frame is resisted on one side of the axle by the rubber bushing 52 and on the other side by the coil spring and rubber element with the rubber loaded in shear. It is, of course, obvious that the coil spring and the rubber elements connecting the spring cup to the truck frame have different physical and springing characteristics. These features result in the provision of a railway car truck which is substantially silent in service. The truck frame members, because of the specific mountings of rubber, may be and preferably are of relatively light material; the provision of rubber in shear cushioning the truck frame while in service.

It will further be apparent to those skilled in the art that the elastic means which connect the journal box to the side frame is not only in shear but is also in compression. In acceleration and deceleration of the car it will be obvious that the elastic material 52 is placed under compression, in acceleration on one side of the fastening element which connects the inner bushing to the side frame and in deceleration on the opposite side. It will still further be apparent that the weight of the car will also place the elastic material 52 in compression vertically and upon rounding a curve the elastic material 52 will be in compression transversely of the car. All of the above occurs while the elastic material 52 is in shear circumferentially.

The drawings herein illustrate certain embodiments of the invention but it is to be understood that the drawings are for illustrative purposes only and various changes in the form and proportions of the constructions may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. In a railway car truck, a frame comprising connected side and end members, journal boxes connected to the side members and having spring seats, springs in said seats, and means supporting the frame on said springs including elastic material so arranged as to be subject to shearing action in service.

2. In a railway car truck, a frame comprising side and end members, journal boxes, means connecting the journal boxes to the side members comprising elastic material so arranged as to be subject to shearing action in service, spring seats formed with the journal boxes, springs in said seats, and means for supporting the frame on said springs comprising elastic material so ar-

ranged as to be subject to shearing action in service.

3. In a railway car truck, a frame comprising side and end members, and means for supporting said frame comprising wheels, axles supported by the wheels, and elongated journal box structures for said axles having one end portion thereof connected to the side members through the medium of elastic material in shear and the opposite end portion formed to provide a spring seat, and a plurality of resilient means having different characteristics and being interposed between the frame and spring seat and supported by the latter.

4. A railway car truck comprising wheels and axles and a frame having side and end members, and lever means for supporting said frame upon said wheels and axles and having one end portion located on one side of the axle and resiliently connected to the frame by elastic material acting in shear and its opposite end portion located on the other side of the axle and underlying the frame, and resilient means interposed between said opposite end portion and frame and on which said frame is supported.

5. In a railway car truck, a frame comprising connected side and end members, and means for supporting the frame comprising a lever having a central body portion and oppositely extending end portions, said body portion constituting a combined gear housing and journal box, one of said oppositely extending end portions being connected to the adjacent side member by elastic material acting in shear and the other oppositely extending end portion having a spring seat formed therewith, and a plurality of resilient means having different characteristics and being interposed between the frame and spring seat and supported by the latter.

6. In a railway car truck, a frame comprising connected side and end members, wheels, axles supported by the wheels, and means for supporting the frame comprising a journal box connected to a side member by elastic material in shear, said journal box having a spring seat, a spring supported in said seat, and a resilient member including elastic material in shear connected to the end member of the frame and resting on the spring.

7. In a railway car truck, a frame including side and end members, a journal box formed with an extension positioned under said end member and including a spring support, a spring in said support, and elastic material connecting the spring and the frame and acting in shear to support the same.

8. In a railway car truck, a frame including side and end members, journal boxes each formed with spring supporting extremities positioned beneath said end members, springs supported by said extremities, elastic elements carried by said springs and supporting the frame, and means extending between and connecting the elastic elements located at directly opposite sides of the truck.

9. In a railway car truck, a frame comprising connected side and end members, journal boxes having extensions forming spring seats, springs in said seats, caps on said springs, means connecting said spring caps, and a resilient connection between the connecting means and the frame.

10. In a railway car truck, a frame comprising connected side and end members, journal boxes having extensions forming spring seats, springs

in said seats, caps on said springs, means for connecting the caps to said frame including U-shaped members supported by each of said caps and enclosing portions of said frame, and elastic elements interposed between the U-shaped member and frame.

11. In a railway car truck, a frame comprising connected side and end members, journal boxes having extensions forming spring seats, springs in said seats, caps on said springs, U-shaped members supported by each of said caps and enclosing portions of said frame, and elastic material interposed between the U-shaped member and the frame and so arranged as to be subject to shearing action in service.

12. In a railway car truck, a frame comprising side and end members, means for supporting said frame comprising wheels, axles supported by said wheels, an elongated journal box structure for each of said axles having one end portion thereof fixed to a side member through the medium of elastic material in shear, and a plurality of resilient means having different characteristics and spacing the opposite end portion from said frame.

13. In a railway car truck, a frame comprising side and end members, means for supporting said frame comprising wheels, axles supported by said wheels, an elongated journal box structure for each of said axles having one end portion thereof fixed to a side member through the medium of elastic material in shear, a spring supported by the opposite end portion beneath said frame, and resilient means between said spring and said frame.

14. In a railway car truck, a frame comprising side and end members, means for supporting said frame comprising wheels, axles supported by the wheels, elongated journal box structures enclosing portions of said axles, one end of each of said journal box structures being fixed to said frame

through the medium of elastic material in shear, and the opposite end portions including spring supporting surfaces, springs mounted on said supporting surfaces, caps enclosing the upper portions of said springs, and resilient means connecting said caps with said frame.

15. In a railway car truck, a frame comprising side and end members, means for supporting said frame including wheels, axles supported by the wheels, a journal box structure bearing on an axle and having an arm extending to one side thereof, a rubber annulus detachably fixed to said frame on the side thereof, and a clamp carried by said journal box arm for securing same to said rubber annulus.

16. In a railway car truck, a frame comprising side and end members, means for supporting said frame including wheels, axles supported by said wheels, a journal box bearing on an axle and having an arm extending to one side thereof and overlapping a side of the frame, a rubber member fixed to the side of said frame and projecting laterally therefrom, a clamp carried by one extremity of said journal box for securing same to said rubber member, and resilient means interposed between the opposite end of said journal box structure and said frame.

17. In a railway car truck, a frame comprising side and end members, means for supporting said frame including wheels, axles supported by said wheels, an elongated journal box, a rubber member fixed to said frame, a clamp carried by one extremity of said journal box for securing same to said rubber member, and means connecting the opposite end of the journal box with the frame including a spring supported by the journal box, a cap enclosing the upper end of said spring and a resilient connection between the cap and said frame.

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