

G. A. BOYDEN, Jr., AND J. C. BOYDEN.
RAILWAY CAR TRUCK.

APPLICATION FILED MAY 22, 1919.

1,341,776.

Patented June 1, 1920.

2 SHEETS—SHEET 1.

Fig. 1

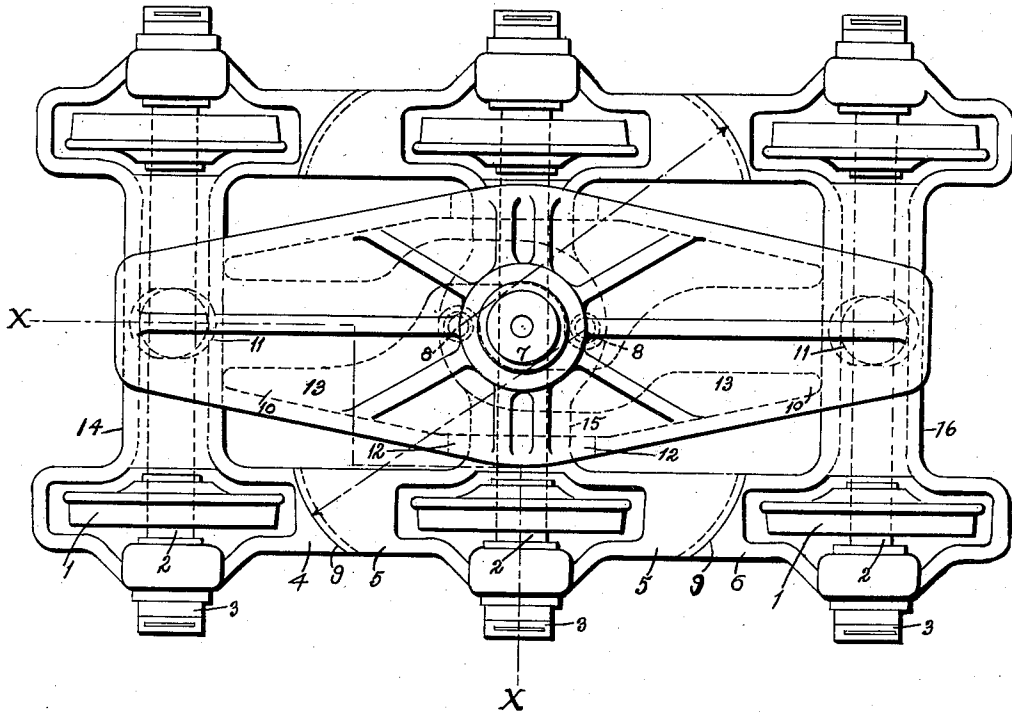
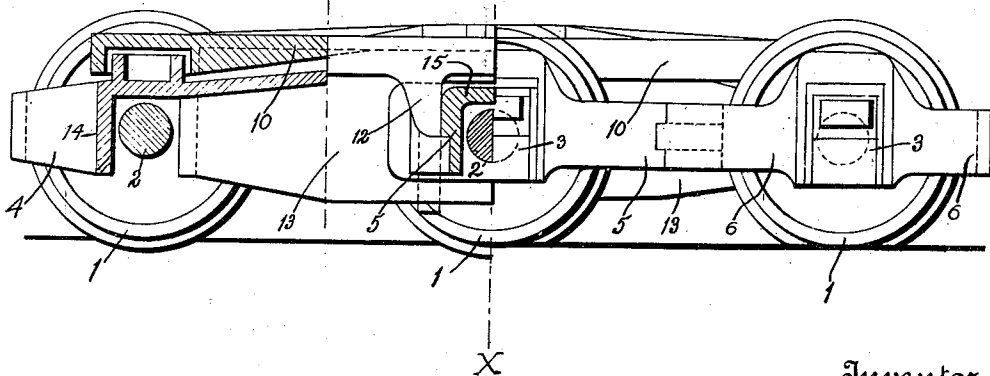


Fig. 2



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Fig-3

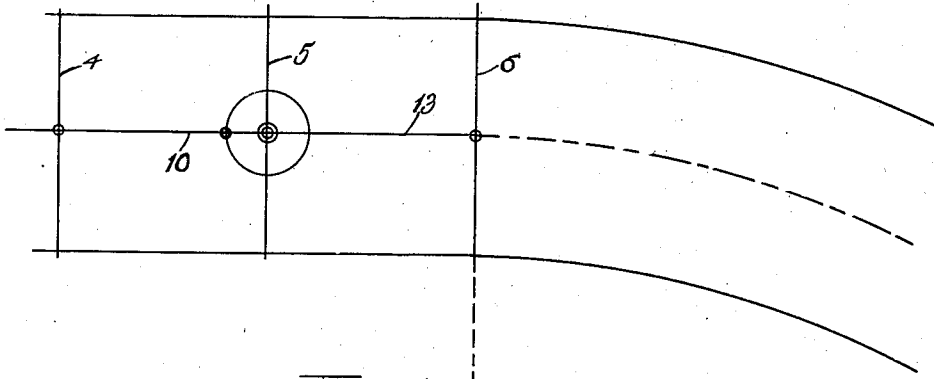


Fig-4

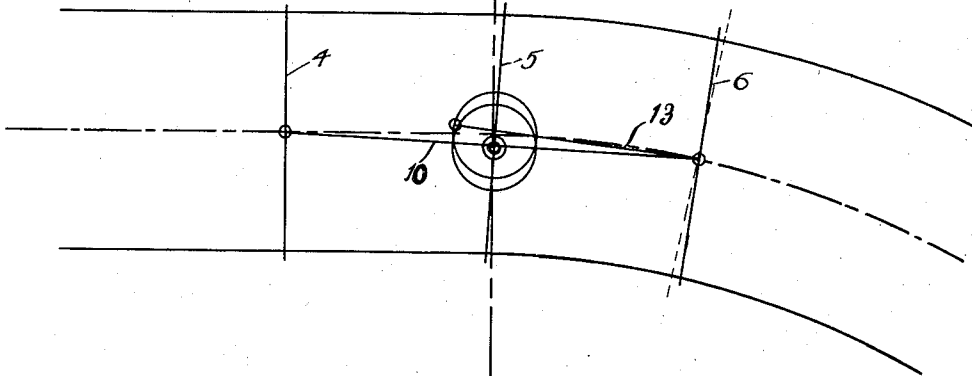
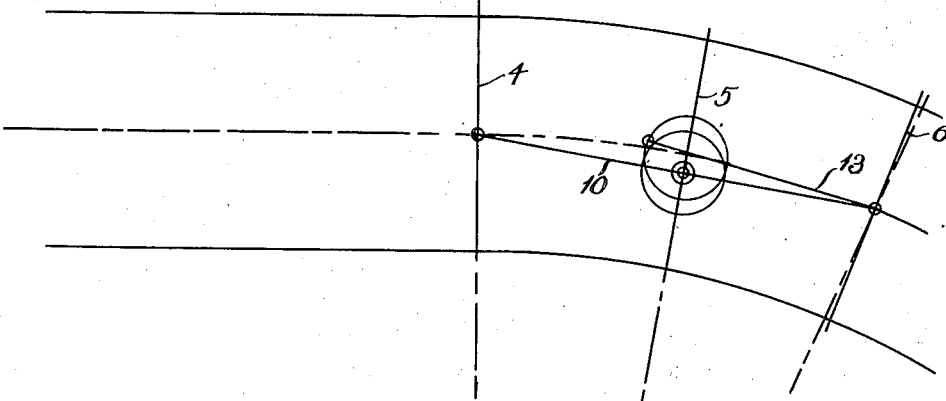


Fig-5



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UNITED STATES PATENT OFFICE.

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RAILWAY-CAR TRUCK.

1,341,776.

Specification of Letters Patent.

Patented June 1, 1920.

Application filed May 22, 1919. Serial No. 298,953.

To all whom it may concern:

Be it known that we, GEORGE A. BOYDEN, Jr., and JOHN C. BOYDEN, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Railway-Car Trucks; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to six-wheel trucks for railway cars and among the objects are:

To save in dynamic energy or reduce the draw-bar pull per ton in railway transportation; to reduce the wear of rails on curves, rail joints, switches, frogs, etc.; to accomplish the maintenance of maximum speed of trains and such other objects as are relevant thereto.

The invention generically consists in co-ordinate angular journal actions and independent transverse journal actions relative to the contour of track, either curved or straight. The angular journal actions are dependent and interdependent on a co-ordinating member connected thereto in such a manner that the several journals assume a position relative to the track contour which affords the least resistance to the movement of the truck in either direction and are simultaneously held or locked in those (varying) positions which are governed by the track contour; also in means combined with the several journal members of the truck that will functionate in the same manner on the central member and differently on the end members with respect to the direction of the truck movement on the track; the pivoting centers of the end journal members located on the far side of the adjoining journals and such other matter and methods of operation as hereafter set forth or claimed.

This application discloses the same subject matter as our application for U. S. Letters Patent Serial No. 205405, filed December 4th, 1917, which became abandoned through failure to prosecute within the statutory time.

In the accompanying drawings, which are for illustration purposes and in no way to limit the scope of the invention or claims, Figure 1 is a top view of the truck with the co-ordinating member shown in full with the

arms and the pivoting centers of the end journal members shown in dotted lines; Fig. 2, side elevation partly in section showing the connections between the co-ordinating and journal members, and Figs. 3, 4, 5, diagrammatic views showing the relation of the journal members in operation, etc. In the drawings like numerals refer to like parts through the several views.

The wheels, journals and journal boxes 1, 2, 3, respectively, are all Master Car Builder standards and said boxes are attached to and governed by the journal members 4, 5, 6, each member being provided with pedestals that fit over the journal boxes 3, in the usual manner. The pedestals at the ends of each of the members 4, 5 and 6 are joined together respectively by frames 14, 15 and 16, preferably formed integrally with said pedestals. The middle frame 15 has two pins 8—8 rigidly supported therein and the end frames 14 and 16 are each provided with an arm 13, preferably formed integrally therewith. The end of each arm 13 is bifurcated, one prong extending over the middle frame 15 and the other prong extending thereunder. Both prongs are provided with holes for the reception of one of the pins 8 and each pair of prongs is mounted on the pin 8 which is remote from the end frame of which the prongs form parts. Thus, each end member is pivotally connected to the middle member upon the pin 8 which is remote from the corresponding end member. In order to give additional vertical rigidity to the journal members thus pivoted together, the outer sections thereof are joined together by tongue and groove bearings 9, whose radius lines, dotted on Fig. 1, extend across the central member to the pivoting point of the end member thus attached. By this construction each of the members, 4, 5, 6, is free to swing in any horizontal direction and assume any position of the track either straight or curved. However as to the said free swinging of the journal members this is not permissible in practice, as it has been found necessary in order to meet the numerous conditions encountered in this class of trucks and rail requirements that a co-ordinate movement of the front or "pilot" member with the central member is essential, leaving the back or "trailer" member to remain neutral or non-active. Therefore a

coördinating member 10 is arranged by being attached to the end journal members 4, 6 by trunnions 11 which extend up into suitable elongated counter bearings in the coördinating member, in which bearings said trunnions have bearings only upon the sides thereof, while the central journal member 5, is held and turned by pedestals 12 of the coördinating member 10 and by which the action of the central journal member is governed and held or retained in its proper position relative to the contour of the track whether straight or curved, as hereafter set forth in the operation and as shown in the diagrammatic views Figs. 3, 4, 5.

The end journal members 4, 6, are pivoted to the far side of the central member 5, to prevent any tendency of the journals buckling one on the other, which is likely to occur if the same are pivoted between each other. Furthermore, the said pivoting centers produce a more concentric relation with the oscillations of the coördinating member 10 on its trunnions and the pivoting centers 8 of the end journal members, 4, 6.

As to spring actions between the rails and car body, equalizing springs can be inserted between the journal boxes and the pedestals thereof and body springs between journal members 4, 5, 6 and the coördinating member 10 which is set forth in additional patent applications.

The journal and coördinating members are made of cast steel in one piece and after being machined at their bearing surfaces, are ready for assembling, without use of tools, nuts, bolts, etc. As the two end journal members 4, 6, are placed in proper relation to the central member 5, when the pins 8 are slipped into position and the coördinating member placed over all with the trunnions 11 in their counter bearings and the pedestals 12 over the central member 5, which secures the whole together in working condition. The said arrangement forming modern interlocking construction that provides many advantages in practice.

In the operation (see diagrammatic Figs. 3, 4, 5, in which the heavy lines 4, 5, 6 represent the journal members; 10 the center of the coördinating member and 13 the pivoting arm of the journal member 6) the truck in approaching the curved portion of the track, Fig. 3, has all the members 4, 5, 6, at right angles thereto, but as soon as the wheel flange of the pilot member 6 passes on the curve, three actions begin to take place, first the pilot member assumes a position nearly radial with the curve of the track, though displaced from the radial position, just sufficient to hold the wheel flange bearing against the outer rail but not binding thereon; second, the central member 5 begins to radiate slightly so that when it reaches the curve of the track it is in position to take

the curve without jerking and, third, the trailer member 4 is retained at right angles to the track to keep the oscillating point of coördinate member 10 in the center thereof in order to hold the several members in correct relation to properly take the curve, without suddenly jerking the car body and load toward the center of curvature of the track when the king pin reaches the radius thereof, see Fig. 4. As the forward movement of the truck continues the members 4, 5, 6, occupy the position shown in Fig. 5, in which position they are operated on the curve with the least resistance thereto and the center member 5 is held in that position by the coördinating member 10 during the traverse of the same, which when terminated the pilot member 6 takes the straight track at right angles thereto the other members responding accordingly, but vice versa when the direction of movement is reversed. By this method of coördinating action between the pilot and central members 5, 6, and the independent action of the trailer member 4, the several members will take the curvature of the track and the center member 5 will be held in the coördinating position relative to the pilot member, also the car body and load will be gradually deflected from the direction of movement to another direction, thereby producing truck operation that will prevent violent action in changing from one position to the other. Furthermore, as shown in Fig. 5, the pilot member 6 is slightly at an angle to the radius, thus keeping the flange of the outer wheel slightly bearing against the outer rail to afford stability to the actions of the truck and insure safety in crossing switches, frogs, etc., thus our improved trucks are constructed with a view of said wheel flange thus bearing against the outer rails of curves. The whole produces a truck to meet the practical conditions encountered in railway transportation and track construction.

There have been many suggested forms of this class of truck and a number of patents issued therefor. However, none employ the structure nor the method of operation hereof, and it is believed that the arrangements of the combination and the method herein employed is new and generic and all equivalents therefor are to be as included with the claims hereof.

Having fully described the invention what is claimed and desired to secure by United States Letters Patent is:

1. In the operation of trucks for railway transportation, the method consisting in the said several journal members coördinating and assuming a position of the least resistance to the movement of the truck in relation to the contour of the track and simultaneously therewith holding the journal members in the assumed positions.

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2. The method in car truck operation consisting in the pilot member controlling the position of the central member without affecting the trailer member, irrespective of the direction of movement of truck on the track.

3. In trucks for railway cars, the combination of the several members 4, 5, 6, and means to operate two of the members coordinately and permit the remaining member to be independent of the coordinating ones.

4. In a six-wheel truck for railway cars the combination of the three journal members 4, 5, 6, and a coordinating member 10, whose movement is governed by either of the end members 4, 6, and said coordinating member governing the action of the central

member 5, independent of either end one of the end members, whereby the several functions involved are accomplished.

5. In six-wheel trucks for railway transportation the combination of three journal members, 4, 5, 6, each end member being pivoted to the far side of the adjoining member.

6. In six-wheel trucks for railway transportation the combination of three journal members 4, 5, 6, each end member being pivoted to the far side of the adjoining member and means to hold and govern the several members in their relative positions.

In testimony whereof, we affix our signatures.

GEORGE A. BOYDEN, JR.
JOHN C. BOYDEN.