April 27, 1943. K. F. NYSTROM ET AL 2,317,399

RAILWAY TRUCK

Original Filed Oct. 31, 1938 2 Sheets-Sheet 1

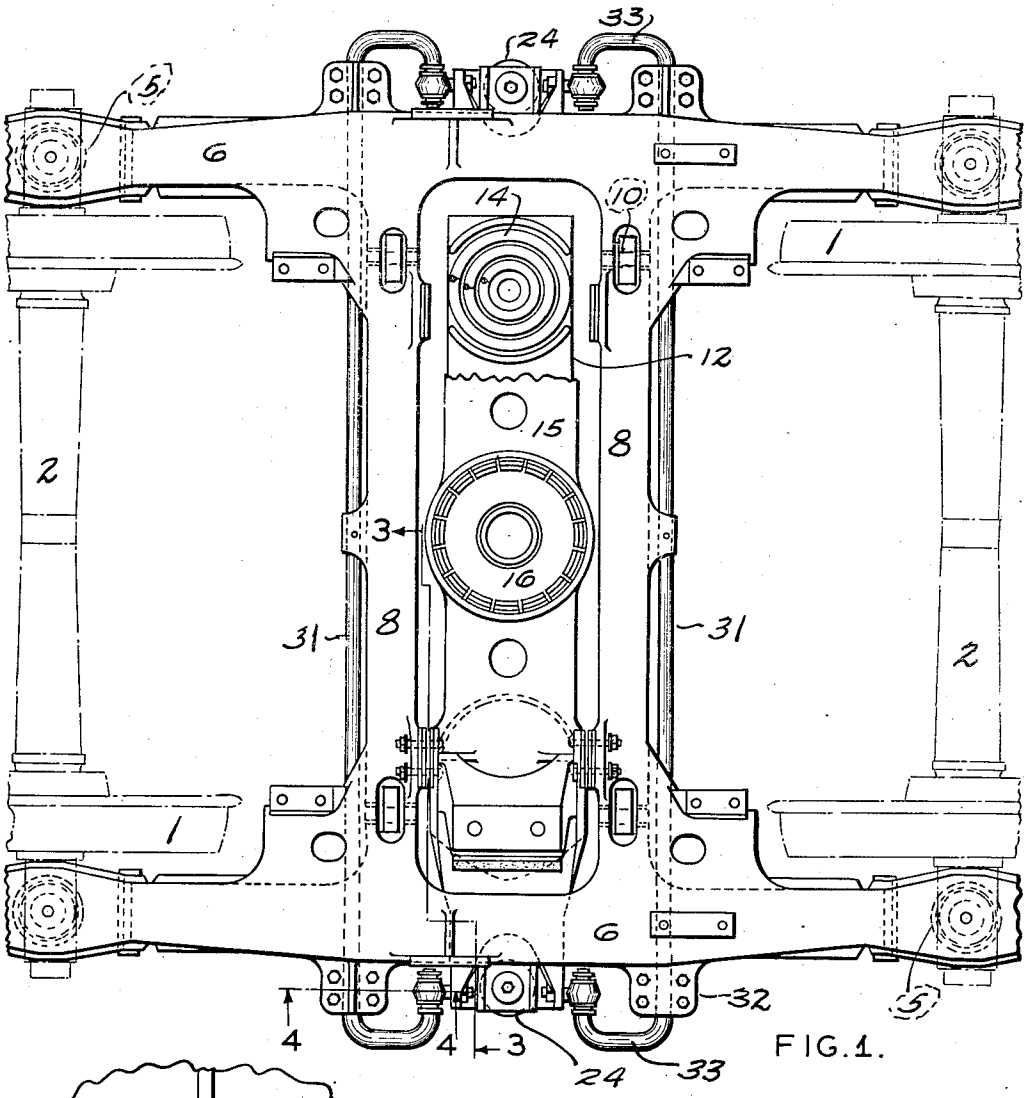


FIG. 1.

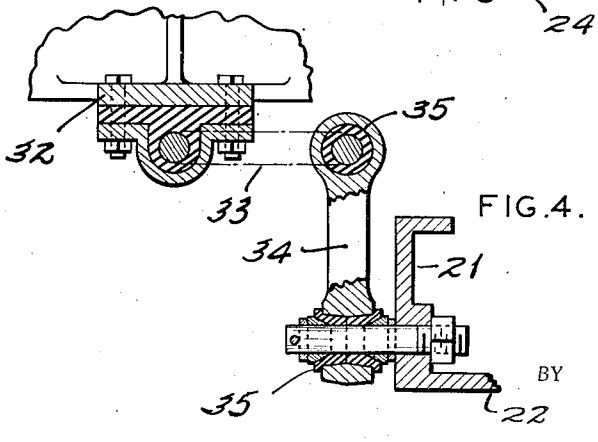


FIG. 4.

INVENTOR
KARL F. NYSTROM
EDMUND S. BECKETTE
VERNON L. GREEN

BY Rodney Bedell
ATTORNEY

April 27, 1943. K. F. NYSTROM ET AL 2,317,399

RAILWAY TRUCK

Original Filed Oct. 31, 1938 2 Sheets-Sheet 2

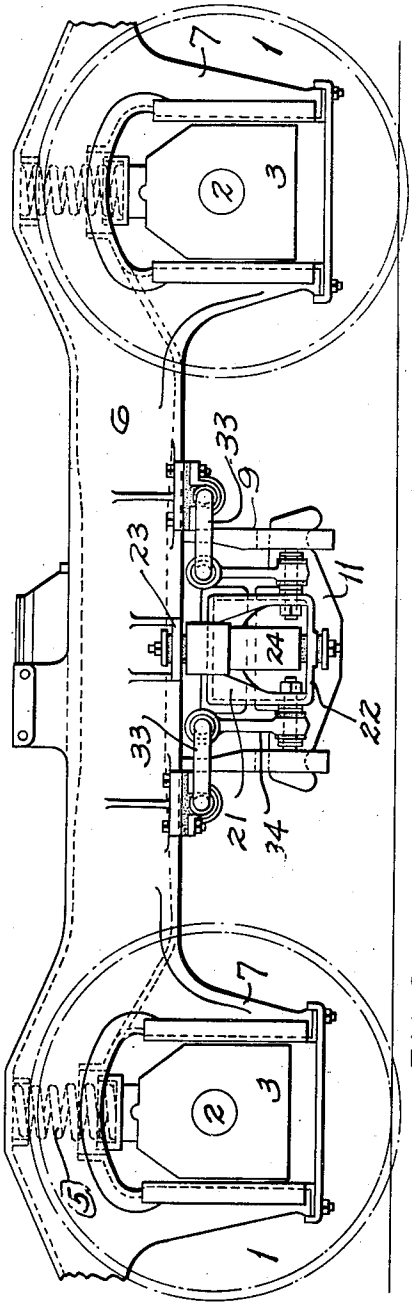


FIG. 2.

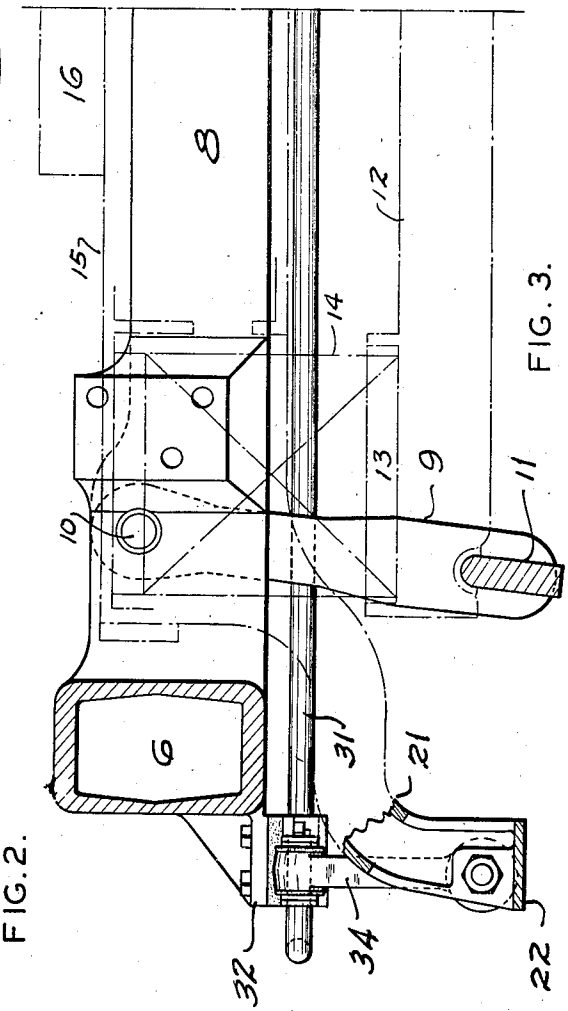


FIG. 3.

INVENTORS
KARL F. NYSTROM
EDMUND S. BECKETTE
VERNON L. GREEN

BY Rodney Bedell
ATTORNEY

Patented Apr. 27, 1943 2,317,399

UNITED STATES PATENT OFFICE

2,317,399

RAILWAY TRUCK

Karl F. Nystrom, Milwaukee, Wis., Edmund S. Beckette, East St. Louis, Ill., and Vernon L. Green, Milwaukee, Wis.; said Beckette assignor to General Steel Castings Corporation, Granite City, Ill., a corporation of Delaware

Application May 6, 1940, Serial No. 333,608, which is a division of application Serial No. 237,820, October 31, 1938, now Patent No. 2,241,418, dated May 13, 1941. Divided and this application August 15, 1941, Serial No. 406,977

9 Claims. (Cl. 105—190)

The invention relates to railway rolling stock trucks and more particularly to trucks adapted to be used in passenger train service, and the invention comprises all of the novel structure described below and illustrated in the accompanying drawings.

Reference is here made to applicants' copending application Serial No. 333,608, filed May 6, 1940, of which the present application is a division, which, in turn, was a division of an earlier application, Serial No. 237,820, filed October 31, 1938, and now Patent No. 2,241,418, issued May 13, 1941.

The main object of the invention is to improve the riding qualities of railway trucks, and more particularly of railway trucks for passenger cars used in high speed service, where sudden vertical and lateral movements of the truck parts tend to tilt or roll the body sideways and cause an uneven compression or deflection of the bolster springs on one side of the truck, relative to the bolster springs on the other side of the truck, which would create discomfort for the passengers.

Another main object of the invention is to stabilize the action of the springs, particularly the bolster supporting springs at opposite sides of the truck, by transmitting forces tending to compress or expand a spring on one side of the truck to a spring on the other side of the truck, so as to keep parts supported by the spring, such as the bolster, in parallel relation with the truck frame, thereby equalizing the load on the springs so as to keep the load on the bolster springs on both sides of the truck the same. It is particularly desirable to keep the bolster parallel with the truck frame when rounding curves or when on uneven road beds where side oscillation might occur, as otherwise the centrifugal force of the car body when rounding curves or due to side oscillations would tilt the body excessively and produce an unstable and undesirable riding discomfort to the passengers.

Another object of the invention is to reduce noise and vibration resulting from metal to metal contact throughout a number of relatively moving parts in the spring stabilizing structure and in its connections to associated parts.

These and other detailed objects as will appear from the following specification are attained by the structure illustrated in the accompanying drawings in which—

Figure 1 is a top view of the major part of a four-wheel truck, the end portions of the sides of the truck being broken away as they are unimportant and to enable the drawing to be made on a larger scale.

Figure 2 is a side elevation of the truck structure shown in Figure 1.

Figure 3 is a vertical transverse section taken on the line 3—3 of Figure 1 but drawn to an enlarged scale.

Figure 4 is a detailed vertical section taken longitudinally of the truck on the line 4—4 of Figure 1 but drawn to an enlarged scale.

The truck includes the usual wheels 1, axles 2, and axle journal boxes 3. A coil spring 5, or a group of coil springs, is mounted upon each journal box and the truck frame rests upon springs 5. The truck frame comprises wheel pieces 6 extending over the axle boxes, pedestal legs 7 depending from wheel pieces 6, transverse transoms 8 spaced apart, and other details customary in such frames but not enumerated here except as particularly mentioned below.

Suspended from the end portions of transoms 8 where they merge with wheel pieces 6 are pairs of swing hangers 9 pivotally mounted in the transoms by pins 10, the links of each pair being connected by a cross bar 11. A spring plank 12 extends between cross bars 11 and has upwardly facing seats 13 mounting the bolster coil springs 14. The main body part of bolster 15 is located at substantially the same level as wheel pieces 6 and it includes a center plate 16, for supporting the truck load, and its end portions include downwardly facing spring cap portions for receiving the upper ends of springs 14.

The details of the spring cap mounting on springs 14 are illustrated and described in detail and claimed in our copending application filed herewith, Serial No. 406,976 and in themselves form no part of the present invention.

Bolster 15 is provided with downwardly and outwardly extending arms 21 projecting beneath wheel pieces 6 and terminating in flanges 22 preferably in vertical alignment with brackets 23 formed on the outer faces of wheel pieces 6. Shock absorber devices 24 are secured to bolster flanges 22 and frame brackets 23 and coact with the frame and bolster to control relative vertical movements thereof by absorbing forces applied to the parts, especially violent and sudden forces which otherwise would result in free action of the springs 14 in both compression and recoil. Since the shock absorbers are between the frame, mounted on springs 5, and the bolster,

mounted on springs 14, they will also function to break up harmonic synchronization of springs 14 and springs 5 and will cooperate with springs 14 to dampen the action of the latter-mentioned springs.

The details of the shock absorbers and their actions are further illustrated and described in our application filed May 6, 1940, Serial No. 333,608, of which the present application is a division.

To stabilize the vertical movement of opposite end portions of the bolster and to further control the actions of the bolster springs and devices 24, there are provided torque rods 31 journalled in brackets 32 on wheel pieces 6, and each torque rod has arms 33 at its opposite ends extending towards bolster 15 but not directly contacting the same. An upright link 34 has a pivotal connection with the inner end of each arm 33, the pivot axis extending transversely of the truck, and the lower end of each link 34 is pivotally connected with a bolster arm 21, the pivot axis extending longitudinally of the truck. Preferably each of these pivotal connections includes rubber mounting elements 35 which take up any play between the parts and break the metal to metal line of contact between the bolster and the frame and accommodate angular movement between the bolster and the stabilizer structure. The pivotal connections between the stabilizer parts and the frame and the bolster avoid the use of sliding joints which have been used in some cross stabilizing arrangements previously proposed.

The stabilizers result in the bolster springs and the snubbing devices operating simultaneously. Hence the work done by the shock absorbing structure at each side of the truck may be reduced. The stabilizers reduce the travel of the snubbing devices because without the stabilizers the snubbing device adjacent the outside of a section of curved track would be subject to greater extension than the snubbing device adjacent the inner side of the curve. Furthermore, the friction between the stabilizer elements and connections to the truck parts, particularly where rubber mountings are used, will have a dampening effect on vertical oscillations of the bolster springs and this will reduce the amount of work to be done by the snubbers.

The stabilizing structure described ties the action of the springs and shock absorber at one side of the truck to the action of the springs and shock absorber at the other side of the truck and thereby improves the riding qualities of the truck and avoids excessive rocking and bouncing of the truck bolster relative to the frame and of the frame relative to the wheels, axles and boxes.

It will be understood that different types of bolster cross stabilization structures may be substituted for those shown, and modifications in the details of the frame, bolster and other parts may be made without departing from the spirit of the invention, and the exclusive use of such variations as come within the scope of the claims is contemplated.

What is claimed is:

1. In a railway truck, a frame, a lateral motion bolster which is spring supported near its opposite ends from said frame, a torque rod extending transversely of and journalled in said frame with arms extending towards said bolster, links pivoted on said arms and depending therefrom and swinging transversely of the truck, and pivotal connections between the lower ends of said links and respective portions of said bolster spaced apart laterally of the truck whereby said torque rod and said links stabilize vertical movement of the bolster ends and also accommodate movement of the bolster transversely of the truck.

2. In a railway truck, a frame, a lateral motion bolster which is spring supported at its end portions from said frame, a torque rod extending transversely of said frame and journalled thereon, arms on said rod, and links depending from said arms and pivotally connected thereto and respectively to portions of said bolster spaced apart laterally of the truck, the pivotal connections including rubber mountings arranged to avoid continuous metal to metal contact through said rod, links and bolster.

3. In a railway truck, a frame having wheel pieces, a lateral motion bolster having a body portion extending between said wheel pieces and spring-supported near its ends from said frame, said bolster having downwardly and outwardly projecting arms extending beneath said wheel pieces, a torque rod extending transversely of said frame and journalled thereon and provided with arms extending towards said bolster, links pivoted to and depending from said torque rod arms and pivotally connected to said bolster arms, said pivotal connections including rubber mountings arranged to avoid continuous metal to metal contact from said frame to bolster through said torque rod, arms and links.

4. In a railway truck, a frame, a lateral motion bolster spring-supported near its opposite ends from said frame, a torque rod extending transversely of and journalled in said frame with arms substantially parallel to the sides of the truck and positioned exteriorly thereof, links each having one end pivoted to one of said arms to swing transversely of the truck, and pivotal connections between the other ends of said links and respective portions of said bolster spaced apart laterally of the truck, whereby said torque rod and links stabilize vertical movement of the bolster ends and their supporting springs and also accommodate movement of the bolster transversely of the truck.

5. In a railway truck, a frame, elements pivotally mounted on said frame, springs supported on said elements, a bolster mounted on said springs to move vertically relative to said frame by the action of said springs and to move laterally of said frame by the pivotal action of said elements, a stabilizer for said bolster comprising a torque rod extending transversely of the truck with each end portion having a pivotal connection to said frame and provided with a crank arm, links with pivotal connections at their ends to the outer ends of said arms and to the corresponding portions of said bolster, said link connections providing universal joint pivoting of the connected parts, whereby equal vertical movement of the opposite ends of the bolster is maintained by the resistance of the rod to torsion while the vertical and lateral movements of the bolster relative to the frame are accommodated by said universal joint connections, at least one of said connections at each end of the bolster including a rubber element yieldingly resisting the pivotal movement of the interconnected parts.

6. In a railway truck, a frame, a lateral motion bolster, spring supported near its opposite ends from said frame, a torque rod extending transversely of and journalled in said frame with

arms extending transversely of the journal portion, links pivoted on said arms and swinging thereon transversely of the truck, and pivotal connections between the swinging ends of said links and respective portions of said bolster spaced apart laterally of the truck whereby said torque rod and said links stabilize vertical movement of the bolster ends and also accommodate movement of the bolster transversely of the truck.

7. A truck as described in claim 1 in which the bolster is provided with side bearings, and the torque rod is journalled in portions of the frame spaced apart transversely of the truck a greater distance than the side bearings.

8. A truck as described in claim 6 in which the torque rod arms are positioned at the outer sides of the frame and the links are connected to projections on the outer ends of the bolster.

9. In a railway truck, a frame, elements pivotally mounted on said frame, springs supported on said elements, a bolster mounted on said springs to move vertically relative to said frame by the action of said springs and to move laterally of said frame by the pivotal action of said elements, a stabilizer for said bolster comprising a torque rod extending transversely of the truck with each end portion having a pivotal connection to said frame and provided with a crank arm, links with pivotal connections at their ends to the outer ends of said arms and to the corresponding portions of said bolster, said link connections providing universal joint pivoting of the connected parts, whereby equal vertical movement of the opposite ends of the bolster is maintained by the resistance of the rod to torsion while the vertical and lateral movements of the bolster relative to the frame are accommodated by said universal joint connections.

KARL F. NYSTROM.
VERNON L. GREEN.
EDMUND S. BECKETTE.