July 5, 1949. W. M. KELLER 2,475,327

RAILWAY CAR TRUCK

Filed April 2, 1948 2 Sheets-Sheet 1

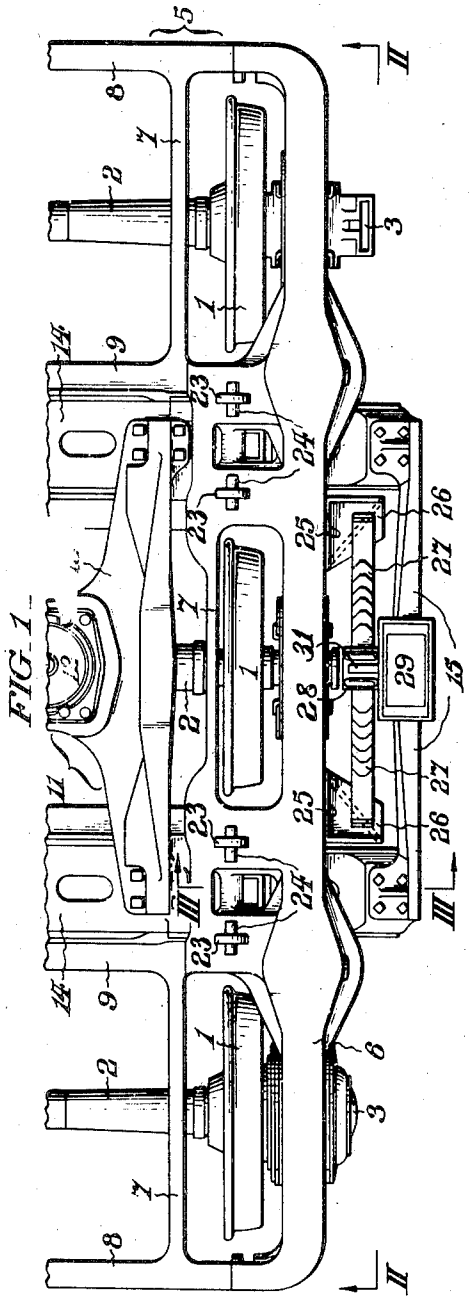


FIG. 1.

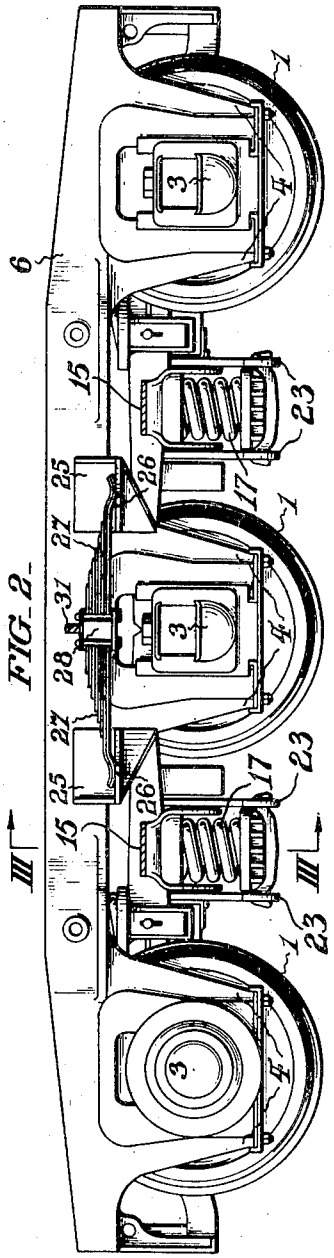


FIG. 2.

WITNESSES

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FIG. 3.

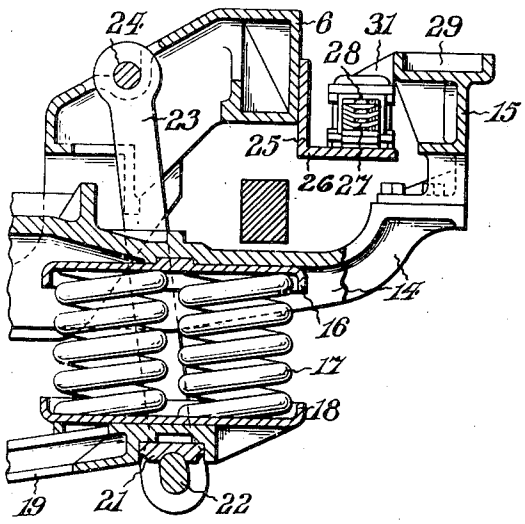


FIG. 4.

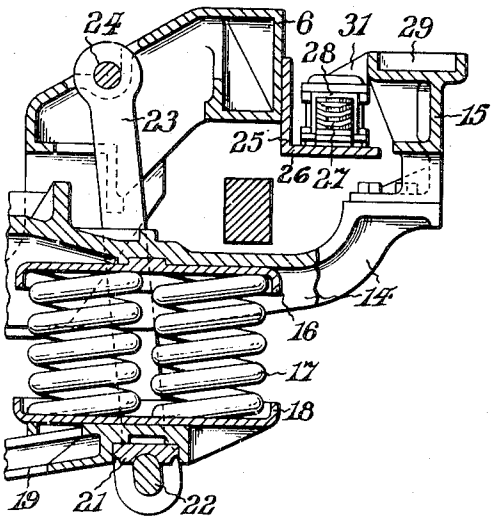
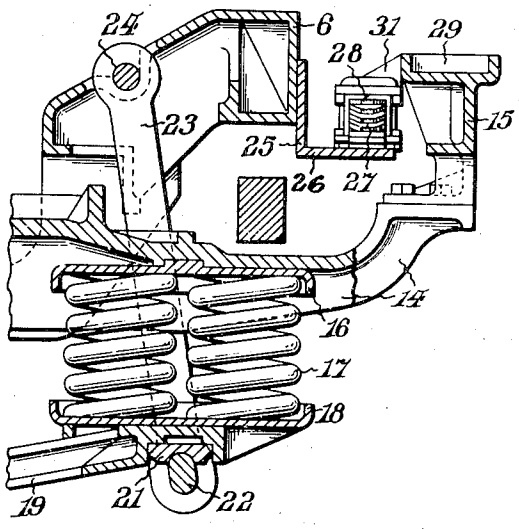


FIG. 5.



WITNESSES

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2,475,327

RAILWAY CAR TRUCK

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Application April 2, 1948, Serial No. 18,552

5 Claims. (Cl. 105—188)

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This invention relates to a railway car truck and, while capable of general application to many different types of trucks, it is especially suited to a six-wheel truck.

Heretofore six-wheel trucks have commonly employed a system of spring suspension in which the bolsters are carried by elliptical springs. Where helical springs have been employed in such trucks, it is well known that there is a tendency to produce harmonic vibrations, since helical springs have practically no work absorption. To overcome the disadvantages of helical springs it has also been a common practice to use hydraulic shock absorbers acting in parallel with the spring group and serving to dampen movements of long or repeated amplitudes. Shock absorbers, however, are difficult to maintain and frequently, as a result of minor defects, are ineffective.

In the truck of this invention most of the bolster weight is supported by main springs, which are desirably of the helical type. To provide easy riding qualities the main springs have a low rate of weight per unit of deflection which, on rough track, if uncompensated, would result in a loss of stability against rolling or swaying. In order to effect the desired lateral and vertical control and to increase stability about the longitudinal car axis, as well as to avoid the disadvantages of shock absorbers, the truck of this invention also embodies auxiliary springs having a special character and relation to the bolster and side frame. These auxiliary springs deflect in parallel with the main springs and the friction involved between the constituent elements of the auxiliary springs absorbs enough work to dampen out harmonic vibrations.

Accordingly the principal object of the invention is to provide an improved spring suspension, including main and auxiliary springs of the character indicated, which can be readily applied to existing truck frames with resulting advantages as set forth above. Other objects and advantages, including those derived from simplicity and economy of manufacture, and ease of assembly, will become more apparent from the description of one practical embodiment of the invention which follows hereinafter, having reference to the accompanying drawings. Of the drawings:

Fig. 1 represents a plan view of one half of a six-wheel railway car truck embodying the invention, the other half being of corresponding design;

Fig. 2 represents a side elevation of the same with certain portions shown in cross section, as indicated by the arrows II—II of Fig. 1;

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Fig. 3 represents an enlarged cross section of the same taken as indicated by the arrows III—III of Fig. 1; and

Figs. 4 and 5 represent views similar to Fig. 3, showing the bolster in the extreme positions which it may assume with lateral swaying movement with respect to the truck frame.

With reference to Figs. 1 and 2 of the drawings it will be seen that the truck generally follows a conventional design. It has six wheels 1 carried upon three axles 2. Each axle 2 is journaled in a journal box 3 disposed between pedestals 4 depending from a one-piece rigid frame 5. The truck frame 5 includes side members 6, wheel guards 7, end members 8 and cross transoms 9, all generally corresponding to well known six-wheel truck design.

A double bolster 11 is spring mounted on the frame 5. The bolster 11 includes the usual center bearing 12, inner longitudinal beams 13 connected thereto, and parallel spaced transverse beams 14 bolted to the longitudinal beams 13. Each transverse bolster beam 14 extends beneath the opposite side members 6 of the frame 5 and is connected at its ends to its companion bolster beam 14 by an outer longitudinal tie beam 15.

As shown more fully in Figs. 3, 4 and 5, the transverse bolster beams 14 have portions intermediate their ends which are supported on spring caps 16 engaging the upper ends of helical springs 17 which constitute the main load carrying springs. At their lower ends the main springs 17 engage seats 18 which are carried on the ends of spring planks 19. The ends of each spring plank 19 are in turn supported by means of pivot bearings 21 on the bottom straps 22 of swing hangers 23. The swing hangers 23 have pins 24 fulcrumed at the top of the side members 6 of the truck frame. In this manner the spring planks 19 are pendulously suspended from the frame with capacity for lateral motion resisted by the springs. Suitable means (not shown) may be employed for limiting the extent of such lateral motion.

Disposed on each side member 6 of the truck frame and extending outwardly therefrom are brackets 25, these brackets being longitudinally spaced, one forward and one aft of the center axle 2, and including horizontal, upwardly facing, bearing surfaces 26 adapted to be engaged by auxiliary springs 27. The auxiliary springs 27 are preferably semielliptic leaf springs bound at the center by a clamp 28 and vertically disposed with their ends in engagement with the horizontal bearing surfaces 26 of the brackets 25.

The outer longitudinal tie beams 15, which constitute extensions of the bolster 11, extend upwardly from the transverse bolster beams 14 so that the medial portion affords a bearing table 29 near the top of the truck frame 5 at its transverse center line. Projecting inwardly from the bearing table 29 towards the truck frame is an integral bracket 31 which surmounts the auxiliary spring and forms an upper, downwardly facing, bearing surface to which it is centrally secured by a spring clamp 28.

It will be observed that the auxiliary springs 27 are thus vertically interposed between the bolster and truck frame in such manner that they act in parallel with the main springs 17. Although the load is carried chiefly on the helical springs 17, the auxiliary springs deflect with vertical motion of the bolster and engage the bearing surfaces 26 with increased frictional resistance as the bolster moves downwardly. The ends of the auxiliary springs 27 have capacity for lateral movement in frictional contact with the bearing surfaces 26 as the bolster moves transversely in relation to the truck frame. As indicated in Figs. 4 and 5 such lateral movement of the auxiliary spring 27 corresponds to the limits of swing of the bolster on the vertical hangers 23. Accordingly the auxiliary springs 27 serve to provide lateral and vertical control of the bolster movement and to increase the stability of the truck about the longitudinal car axis. Furthermore, the friction between the individual leaves of the auxiliary springs absorbs sufficient energy to dampen out the harmonic vibrations which are characteristic of helical springs when used alone.

Although there has been described herein a single embodiment of the invention as applied to a six-wheel truck of a generally conventional design, it will be apparent that the invention is equally applicable to many other forms of trucks, that the spring suspension specifically shown and described herein may be considerably varied, with reversals of parts and substitutions of equivalent mechanisms, and that certain features of the invention may be used to advantage without use of other features, all without departing from the spirit of the invention as defined in the annexed claims.

Having thus described my invention, I claim:

1. In a car truck a frame including longitudinally spaced bearing surfaces at the sides thereof, a spring plank pendulously suspended from said frame, main springs seated on said spring plank, a bolster having portions supported on said main springs, and leaf springs acting in parallel with said main springs and interposed between and engaging the bolster and side frame with their ends slidably seated on said spaced bearing surfaces with capacity for lateral movement on said surfaces.

2. In a six-wheel truck, a frame including longitudinally spaced bearing surfaces at the sides thereof, forward and aft of the center axle, spring planks pendulously suspended from said frame, forward and aft of the center axle, main springs seated on said spring planks, a double bolster having transverse beams supported on said main springs and having a connecting tie beam at the ends of said transverse beams, and leaf springs acting in parallel with said main springs and interposed vertically between and engaging the tie beam of said bolster and the side frame with their ends slidably seated on said spaced bearing surfaces with capacity for lateral movement on said surfaces.

3. In a six-wheel car truck, a frame including side members having longitudinally spaced outwardly projecting brackets with horizontal bearing surfaces, one forward and one aft of the center axle, spring planks pendulously suspended from said frame, forward and aft of the center axle, main springs seated on said spring planks, a double bolster having transverse beams supported on said main springs and having a connecting tie beam at the ends of said transverse beams, and leaf springs acting in parallel with said main springs and interposed vertically between and engaging the tie beam of said bolster and the side frame with their ends slidably seated on said spaced bearing surfaces with capacity for lateral movement on said surfaces.

4. In a car truck, a frame having an outwardly projecting, upwardly facing, spring bearing surface, a spring plank pendulously suspended from said frame, main springs seated on said spring plank, a bolster having portions intermediate its ends supported on said main springs beneath the side members of the frame and having at its ends an upward extension terminating in an inwardly projecting, downwardly facing, spring bearing surface, and an auxiliary spring acting in parallel with said main springs and interposed vertically between and engaging the spring bearing surfaces of said frame and of said bolster extension, said auxiliary spring being laterally movable on one of said bearing surfaces.

5. In a car truck, a frame having an outwardly projecting horizontal spring bearing surface, a spring plank pendulously suspended from said frame, main springs in the form of helical springs seated on said spring plank, a bolster having portions intermediate its ends supported on said main springs beneath the side members of the frame, and having at its ends an upward extension terminating in an inwardly projecting spring bearing surface, and an auxiliary semi-elliptic leaf spring acting in parallel with said main springs and interposed vertically between and engaging the spring bearing surfaces of said frame and of said bolster extension, said auxiliary spring being laterally movable on one of said bearing surfaces and clamped to the other of said bearing surfaces.

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