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ARRANGEMENT IN BOGIES FOR RAILWAY CARRIAGES AND THE LIKE

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Fig. 1.

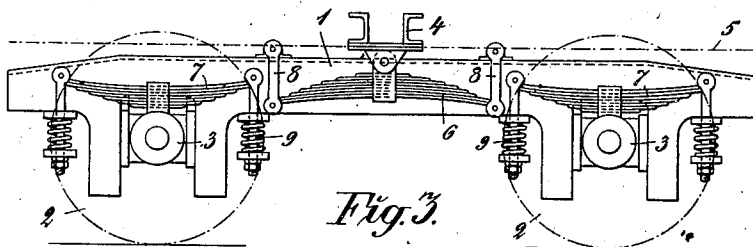


Fig. 3.



Fig. 2.

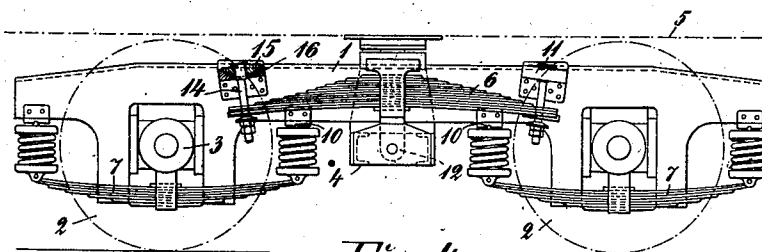


Fig. 4.



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ARRANGEMENT IN BOGIES FOR RAILWAY
CARRIAGES AND THE LIKE

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1 Claim. (Cl. 105—182)

The present invention refers to an arrangement in bogies for railway carriages, the same being provided with a cradle spring and lateral supporting springs, and the invention has for its object to dispose the springs in a manner such that the deflecting forces transmitted from the cradle spring and acting upon the frame of the bogie obtain smaller arms of moment, while the carrying forces from the lateral supporting springs obtain greater arms of moment than hitherto, the point of gravity of the bogie being at the same time lowered and the lateral supporting springs at least obtaining a stable suspension in the bearing boxes of the wheel axles, whereby facilities are provided for making the frame of the bogie lighter while maintaining the ordinary distance between the wheels in the bogie.

According to the invention, this is effected by all lateral supporting springs being suspended in the bearing boxes beneath the wheel axles, and being adapted with their inner ends to support the frame in points situated nearer to the vertical transverse plane of symmetry than the supporting points of the cradle springs in the frame arranged symmetrically with respect to the said plane.

According to one form of embodiment of the invention, the suspension points of each of the cradle springs in the frame may then be situated between the inner end of the corresponding lateral supporting spring and the centre of the wheel.

According to the invention, the cradle spring and the lateral supporting springs may, furthermore, be arranged in the same vertical plane outside the side frame of the bogie, whereby the longitudinal forces transmitted from the wheels to the frame are prevented from causing turning moments.

A further very important feature of the invention consists therein that the body of the carriage may be so suspended in the cradle springs that the weight of the body is transmitted onto these springs from a point beneath the same, whereby the cradle springs will also obtain a stable loading, suppressing the possibility for the carriage body to be brought into longitudinal oscillations relatively to the bogie. In order further to reduce the possibility of such oscillations as well as oscillations in a lateral direction, the ends of the cradle springs are suspended in the frame by means of spherical pendulum links mounted in the frame under friction.

The accompanying drawing illustrates in ele-

vation a bogie constructed in the manner hitherto practiced, in Fig. 1, as well as a bogie constructed in accordance with the invention, in Fig. 2. Fig. 3 is a diagrammatic view showing the loading conditions of the bogie illustrated in Fig. 1, and Fig. 4 is a diagrammatic view showing the loading conditions of the bogie illustrated in Fig. 2.

In both Figs. 1 and 2, 1 designates the frame of the bogie, 2 the wheels, 3 the axle boxes, 4 the girders or the like carrying the pivot pin, 5 the bottom of the carriage body, 6 the cradle springs, and 7 the lateral supporting springs.

As will appear from Fig. 1, the weight of the carriage body is transferred to the centre of the cradle spring 6 by pressing against the upper side of this spring, while the spring 6, in turn, transmits the weight to the frame 1 of the bogie through the links 8 mounted pivotally in the ends of the spring and in the frame. From the bogie, the weight of the carriage body and of the bogie is then transmitted to the axle boxes 3 of the wheels 2 by means of the resiliently mounted links 9, which are pivotally connected to the ends of the lateral supporting springs 7 so as to permit the lateral supporting springs 7 resting at their central portion on the upper side of the axle boxes 3 to transmit the total weight of the carriage to the wheels 2.

As will be seen from Fig. 1, the cradle spring 6 as well as the lateral supporting springs 7 are loaded in an unstable manner, promoting the production of longitudinal oscillations of the carriage body. It will be apparent, moreover, that the lateral supporting springs 7 cannot project past the end portions of the cradle spring 6, but must be kept comparatively short. Hereby, the cradle spring 6 is prevented from obtaining a short arm of moment relatively to the outer suspension points of the lateral supporting springs 7, while the latter springs will at the same time obtain a short arm of moment at their inner ends.

In this known embodiment, the frame of the bogie is thus carried as a girder supported at each end in two points, while the load acts in two points located nearer to the centre of the girder, see Fig. 3. On account of this, the frame of the bogie 1 is subjected to an unfavourable loading, necessitating a very rugged and heavy construction.

In the bogie constructed according to the invention, as shown in Fig. 2, these disadvantages are obviated to a considerable extent, it having been possible to make both the cradle springs 6 and the lateral supporting springs 7 longer.

This is facilitated, according to the invention, by the fact that the lateral supporting springs 7 are suspended in a stable manner in the bearing boxes 3 beneath the wheel axles, while at the same time supporting the frame 1 with their inner ends in points 10 situated nearer to the vertical transverse plane of symmetry of the frame than the suspension points 11 of the cradle springs in the frame, which springs are symmetrically arranged relatively to the said plane. The loading conditions in the bogie will then be as indicated in Fig. 4.

As will further appear from Fig. 2, the cradle spring 6, which is arranged in the same vertical plane as the lateral supporting springs 7, is loaded at the central portion thereof by the carriage body by a girder system 4 projecting down to the lower side of the cradle spring and carrying the pivot pin at the top thereof, said girder system engaging the cradle spring 6 by means of a link 12, whereby the cradle spring will also be loaded in a stable manner.

The ends of the cradle spring 6 engage the frame by links 14, which are formed with spherical heads 15 at the top portions thereof, said heads being mounted with friction in corresponding spherical bowls 16 in the frame 1 for the purpose of damping any oscillations of the carriage body. As will be seen from Fig. 2, the ends of the cradle springs 6 are suspended, according to

the invention, in the frame 1 at points outside the ends of the lateral supporting springs 7 facing the central portion of the frame, and the suspension points 15, 16 of the cradle springs 6 in the frame may preferably be arranged between the inner end of the corresponding lateral supporting spring 7 and the central axis of the wheel 2.

Having now particularly described the nature of my invention and the manner of its operation what I claim is:

In a bogie for railway cars, the combination of a frame, two pairs of wheels, axles for said wheels, a pair of bearing boxes for journalling each axle, below each bearing box a supporting leaf spring suspended at its centre to the bearing box and having its ends connected to the frame to support the latter, along each side of the frame a cradle leaf spring disposed at a higher level than said supporting springs and arranged substantially symmetrically relative to the centre of the frame, said cradle springs having their ends suspended by the frame, pivot means for journalling and supporting a railway car, means for transmitting the load from said pivot means to the centre of the cradle springs from underneath the latter, the suspended ends of said cradle springs being disposed between the adjacent ends of the supporting springs and the corresponding wheel axle.

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