

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN RUNNING-GEAR FOR CARS.

Specification forming part of Letters Patent No. **183,023**, dated October 10, 1876; application filed February 10, 1876.

To all whom it may concern:

Be it known that I, GARNET W. REMSEN, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Running-Gear of Railway-Cars, of which the following is a description:

The object of this invention is to provide a perfect adaptability of the running-gear of railway-cars to curves and irregularities in a railway without employing trucks and king-bolts, these being objectionable, especially for the smaller railway-cars drawn by horses, because they very materially increase the cost and weight of such cars. To this end the invention consists in the combination, with the pillow-blocks of a car, independent spring-supporting bars or plates, provided with arc-shaped and concentric or nearly concentric slots or grooves, and the axles, of journal-boxes provided with tongues or tenons fitting in the aforesaid slots or grooves adapted to move forward or back relatively to the pillow-blocks, and preferably held in place by springs, whereby the pairs of wheels are enabled to adjust themselves, independently of the car body or platform, into the position of radii of curves in a railway, and hence will pass over the same without binding, and without straining the car, or increasing the draft of the same.

The invention also consists in the combination, with the journal-boxes of a railway-car, of spherical or spheroidal bearing-pieces, or their equivalents, whereby, provision being afforded for radial play of the axle in vertical and horizontal planes, all straining of the car and binding of the journals in the journal-boxes incident to irregularities in the railway are obviated, and the car is made more durable, and its propulsion is facilitated.

The invention also consists in the combination, with the aforesaid adjustable journal-boxes, and preferably the spheroidal bearing-pieces, of a fulcrum-piece arranged midway between each pair of journal-boxes, whereby the adjustment of the pairs of wheels in passing over a curve is facilitated.

In the accompanying drawing, Figure 1 is a sectional side view of a pillow-block and a transverse vertical section of a journal-box,

spheroidal bearing-piece, and car-axle embodying my invention. Fig. 2 is a vertical section of the same, taken parallel with the axle. Fig. 3 is a plan of the bottom of the pillow-block, illustrating provision for the forward and backward movement of a journal-box arranged within it. Fig. 4 is a side view of a fulcrum-piece and transverse section of an axle passing through the same; and Fig. 5 is a horizontal section of such fulcrum-piece.

Similar letters of reference designate corresponding parts in all the figures.

A designates one of the wheels of a railway-car; B, the axle thereof, and C its journal. D designates a journal-box, fitting upon said journal C, and E a pillow-block, supported on such journal-box, and attached to the sill or frame-work F of a car.

The journal-box D is provided, respectively on the top and bottom, with tongues or tenons *a* and *a'*. The former fits in an arc-shaped slot or groove, *b*, in the bottom of the pillow-block E, and the latter in a similarly-shaped and parallel slot or groove, *b'*, provided in a plate, G, on which bear springs H, supporting the said pillow-block and the portion of the car to which the same is attached. The arc-shaped slots or grooves *b* and *b'* of each pillow-block and plate G are concentric or nearly concentric with those of the opposite pillow-block and plate, wherefore they provide for the shifting of the journal-boxes as the car passes over a curve, one forward and its fellow backward, to allow the axle on which said boxes are arranged to assume the position of a radius of such curve. It is obvious that, if the journal-boxes of each pair of wheels belonging to a car are free to shift in this manner, the several pairs of wheels will perfectly adjust themselves to curves, pass over the same without binding, and that, the straining of the car being thereby avoided, it will be more durable, and its draft will be decreased.

The slots or grooves, though preferably made arc-shaped when employed to provide for the shifting of ordinary journal-boxes, may, when used in conjunction with features which I shall presently describe, be made perfectly straight with equal advantage.

I J designate springs interposed between the sides of the journal-boxes and their pillow-

blocks. The springs I are ordinary leaf-springs, and the springs J consist of tubular pieces of india-rubber or other elastic material, and are interposed between the springs I and the adjacent sides of the pillow-blocks. These springs prevent violent concussions of the journal-boxes against the pillow-blocks, as the former adjust themselves during the travel of the car. They are not absolutely necessary, but I prefer to use them or others suitably applied, for the purpose just mentioned.

K L L' designate a fulcrum-piece, consisting of a hanger, K, and bearing-blocks L L', india-rubber or any other elastic substance or suitable springs being preferably interposed between the sides, top, and bottom of the bearing-pieces and hangers, to prevent violent concussions between them. The bearing is considerably elongated, so as to allow of the vertical play of the car as its springs H yield. I prefer to arrange on the axle, inside the said fulcrum-piece, a spherical or spheroidal fulcrum-boss or hub, N, and to hollow out the bearing-piece laterally opposite the same, though I prefer not concentrically with it. The office of this fulcrum-piece is to prevent the axle of a car from moving bodily forward or backward any considerable distance, and to form a center on which the same may bear as the wheels adjust themselves to a curve or bend in the railway. It also serves as a safeguard to hold the axle in case of the breakage of either journal-box. It is not by any means necessary to use this fulcrum-piece in connection with the adjustable journal-boxes, although it may be always used with advantage. Neither is it necessary to use springs with such journal-boxes when the fulcrum-piece is employed, though I prefer so to use them. The journal-boxes D are provided, as usual, with bearing-blocks O O, but these are somewhat different from the style hitherto used, as I shall presently explain. M designates spheroidal bearing-pieces applied to the axle-journals C and fitting within the bearing-blocks O O. They may either be fitted loosely on the journals or be rigidly secured thereto, and the bearing-blocks are hollowed out similarly to the exterior of said bearing-pieces, though they are of a much flatter curve, so as to allow of the free play of the former in every direction, as may be understood by reference to Fig. 2. I prefer to make these bearing-pieces hollow, as illustrated in the drawing, and to perforate them with small holes both through the inner and the outer shell, so as to reduce the friction and permit the lubricating oil or grease to pass freely through them.

It is obvious that these bearing-pieces may, with equal advantage, be made spherical instead of spheroidal, or, indeed, externally concave instead of convex, providing the bearing-blocks be made to correspond. It is, indeed, necessary in any case to employ only the upper half of the bearing-pieces and allow for

the play of the journals of the axle below. These bearing-pieces are preferably used in conjunction with the adjustable journal-boxes, as then provision is afforded for the universal adjustment of the axles relative to but independent of the car, the friction of the journals is reduced to a minimum, the straining of the car obviated, its passage around curves facilitated, and its draft decreased. I desire to remark, however, that they may be very advantageously used in connection with the ordinary fixed journal-boxes.

When such bearing-pieces are used in conjunction with the adjustable journal-boxes, the latter may move forward and backward in straight slots or grooves, as the said bearing-pieces provide for the radial and longitudinal play of the journals in the journal boxes.

This invention may, with the advantages before enumerated, be applied to the trucks of the larger kinds of railway-cars.

It will be seen from the foregoing description that my invention reduces the friction of the journals in the journal-boxes, provides for turning curves and passing over irregularities in a railway without straining a car, and enables cars to be made of any desirable length, or, in other words, the pairs of wheels to be apart any distance without employing trucks or king-bolts.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a railway-car, of pillow-blocks and independent spring-supporting bars or plates, provided with arc-shaped concentric or nearly-concentric slots or grooves, and automatically-adjustable journal-boxes provided with tongues or tenons fitting in the aforesaid slots or grooves, substantially as and for the purpose herein set forth.

2. The combination, with pillow-blocks provided with arc-shaped and concentric or nearly-concentric slots or grooves, and automatically-adjustable journal-boxes, provided with tongues or tenons fitting in such slots or grooves, of springs arranged between the said pillow-blocks and journal-boxes, for obviating violent concussions between them, substantially as set forth.

3. The combination, with a pair of wheels arranged on a continuous axle and capable of adapting themselves to curves in a railway, of a fulcrum-piece arranged midway between them and consisting of a hanger and bearing-blocks, and preferably an interposed packing, substantially as and for the purpose herein specified.

4. The combination, with the journal-boxes of a railway-car, of bearing-pieces applied to the axle-journals and bearing-blocks, substantially as described, whereby provision is afforded for the automatic adjustment of the axles in every direction.

5. The combination, with the pillow-blocks of a railway-car, of automatically-adjustable

journal-boxes and bearing-pieces, applied to the axle-journals, and providing for the independent adjustment of the axle, substantially as described, whereby provision is afforded for the universal and independent adjustment of the axles of a car.

6. The combination of the pillow-block E, plate G, springs H, adjustable journal-boxes

D, springs I J, fulcrum-piece K L L', and bearing-piece M, substantially as and for the purpose herein set forth.

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Witnesses:

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