

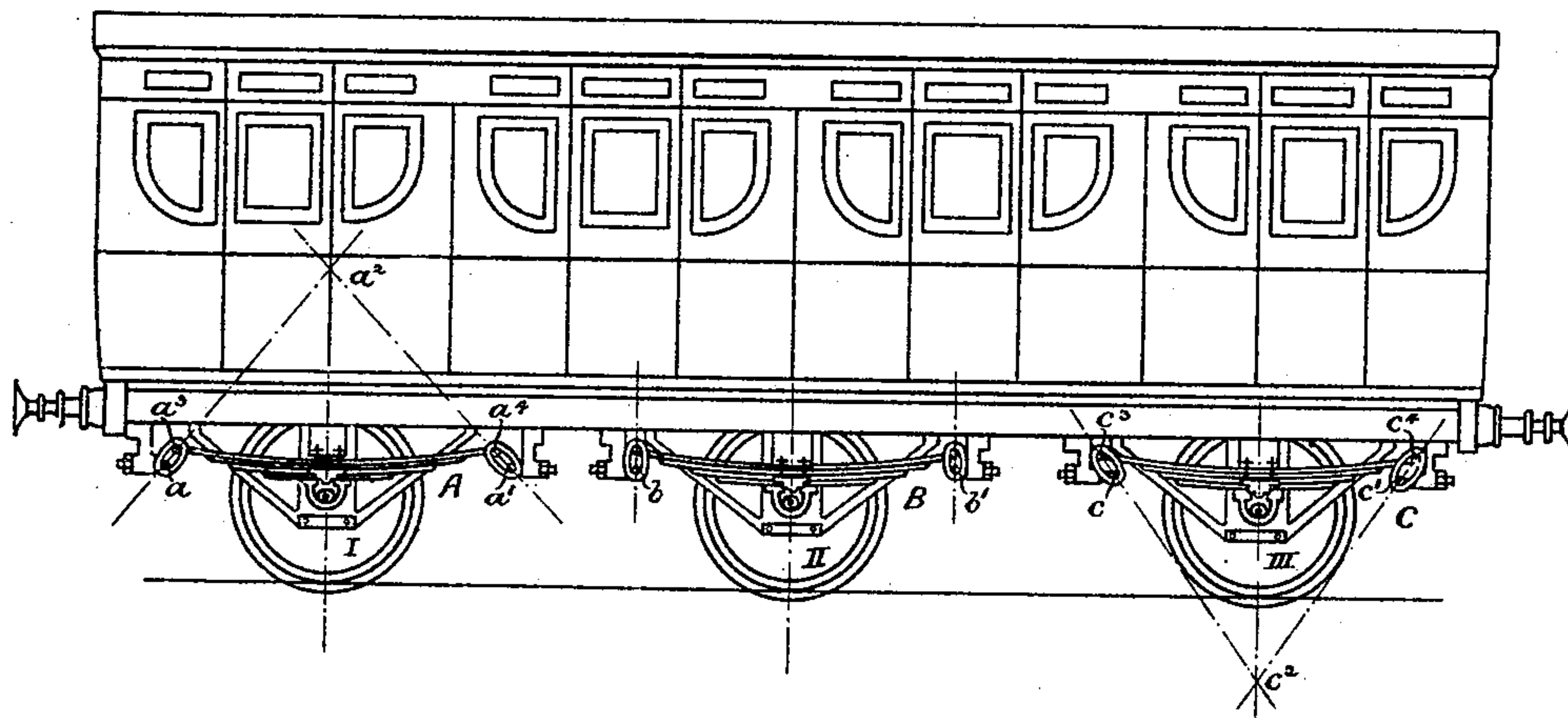
(No Model.)

A. L. FÉRAUD.

METHOD OF HANGING CAR BODIES.

No. 389,374.

Patented Sept. 11, 1888.



WITNESSES:-

Ernest Lambert
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UNITED STATES PATENT OFFICE.

ALPHONSE LUCIEN FÉRAUD, OF PARIS, FRANCE.

METHOD OF HANGING CAR-BODIES.

SPECIFICATION forming part of Letters Patent No. 389,374, dated September 11, 1868.

Application filed December 12, 1887. Serial No. 257,650. (No model.) Patented in France June 14, 1887, No. 184,215; in England June 14, 1887, No. 12,960; in Austria-Hungary August 29, 1887; in Belgium December 12, 1887, No. 79,880, and in Italy December 31, 1887, 22,748, XXI.

To all whom it may concern:

Be it known that I, ALPHONSE LUCIEN FÉRAUD, a citizen of the Republic of France, and a resident of Paris, (Seine,) France, have invented certain Improvements in Mounting the Bodies of Railway-Carriages, Tram-Cars, and Similar Vehicles, (for which I have been granted Letters Patent in France June 14, 1887, No. 184,215; in Great Britain June 14, 1887, No. 12,960; in Belgium December 12, 1887, No. 79,880; in Italy (for fifteen years) December 31, 1887, No. 22,748, v. XXI, and in Austria-Hungary August 29, 1887,) of which the following is specification.

My invention relates to the mounting of the body of a railway or other carriage on its springs through the medium of links; and the object is to provide a mounting that will reduce the loss of flexure of the spring, to reduce the strain on the main or longer leaf of the spring, to lessen the descent of the carriage-body as compared with the downward flexure of the ends of the springs, and to add to the smoothness of operation and stability.

My invention will be fully described hereinafter, and its novel features carefully defined in the claim.

The accompanying drawing represents in said elevation a railway-carriage having three wheels, my improved method of mounting being shown as applied to one of these pairs—namely, that at the right in said figure.

The links or straps $a\ a'$ of the bearing-spring A, which is attached to the axle I at the left, are arranged in the usual manner—that is to say, they are so inclined that their produced axes meet at a point, a'' , situated upon a vertical line passing through the center of the said axle I and above the horizontal line joining the centers of the curved or looped extremities $a^3\ a^4$ of the main leaf or blade of the said bearing-spring A. I shall hereinafter designate such ordinary position of the links or straps by the words “outer arrangement of the links or straps.” This mounting has the following defects: First, the loss of flexure is greater than that corresponding with the weight of the carriage-frame, in consequence of the horizontal strain exerted by the links or straps upon the said spring; second, the main leaf of the spring

is much more loaded than the others, and there is in consequence a tendency for the same to break; third, the flexibility of the spring is considerably diminished, and consequently there is a want of smoothness in the running of the carriage; fourth, until the spring becomes flattened the carriage-frame descends a greater distance than the centers of the curved or rolled ends of the leaf of the spring, this taking place without any benefit arising therefrom.

The links or straps $b\ b'$ of the bearing-spring B, which is attached to the middle axle, II, are arranged in such a manner that their axes are parallel with one another and with the vertical line passing through the center of the said axle II. I have shown this mode of mounting merely to serve as an illustrative transitional arrangement between the one above referred to and the one to be described hereinafter. It remedies to a certain extent the defects above mentioned; but it is subject to conditions of instability or unsteadiness which would necessitate the addition of extra parts—in the form of stop-pieces, for example.

The links or straps $c\ c'$ of the bearing-spring C, which is attached to the axle III at the right in the figure, are inclined in such a manner that their produced axes meet at a point, c'' , situated upon a vertical line passing through the center of said axle and below the horizontal line joining the centers of the coiled extremities $c^3\ c^4$ of the main leaf of the said bearing-spring C. I shall hereinafter designate this improved arrangement of the straps or links by the words “inner arrangement of the links or straps.” This system has the following advantages: First, the loss in flexure of the bearing-spring under the action of the weight of the carriage-frame is less than that produced with the outer arrangement of the links or straps; second, there is less strain on the main leaf of the bearing-spring than with the outer arrangement of the links or straps; third, the flexibility of the bearing-springs is considerably increased, and greater smoothness is consequently obtained on the movement of the carriage-frame; fourth, until the bearing-spring becomes flattened the carriage-frame descends a less distance than the centers of the coiled ends of the main leaf.

All the defects and advantages above mentioned may be readily explained by calculations and by the construction of curves representing the results of such calculations. Ex-
5 periments having reference to the flexibility of springs prove that the mere passage from the usual outer arrangement of links or straps to my improved inner arrangement of the same (the inclination of the links being equal
10 in both cases) nearly doubles the flexibility of the loaded spring. This considerable increase in the flexibility of the bearing-spring enables the suspension of carriage-frames upon other frames to be avoided, together with the numer-
15 ous isolated springs involved by their use, which are costly to keep in repair and almost impossible to get to work together. For the same reason, springs which have hitherto been considered too heavy may be brought into
20 use, the flexibility of each spring being altered at will by merely varying the inclination of its links or straps. With my improved arrangement of links I obtain as great rigidity as with the old arrangement.

What I claim as my invention, and desire to 25 secure by Letters Patent, is—

The improved means for suspending the bodies of railway, tramway, and other similar vehicles, the characteristic feature of which is the inward inclination of the links or straps 30 employed for connecting the extremities of the bearing - springs with the carriage - frames—that is, the said links or straps are so inclined that their axes when produced meet upon the vertical line passing through the center of the 35 main leaf of the spring at a point situated beneath the spring, or on the opposite side to that on which the main leaf is situated.

In witness whereof I have hereunto signed my name in the presence of two subscribing 40 witnesses.

ALPHONSE LUCIEN FÉRAUD.

Witnesses:

ERNEST LAMBERT,
EDOUARD CARÉNON.