United States Patent

Henricot

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[54] **DEVICE FOR SUSPENDING SIDE-FRAMES ON AXLE BOXES FOR RAILWAY CARRIAGES AND SIMILAR APPLICATIONS**

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[52] **U.S. Cl.** **105/224.1,** 267/63

[51] **Int. Cl.** **B60b 17/00**

[58] **Field of Search** 105/226, 218, 224.1; 267/35, 267/63; 152/47

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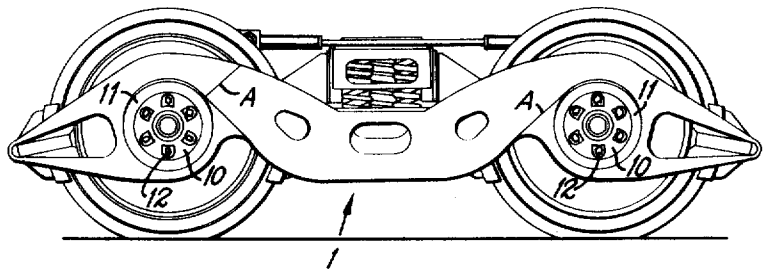
[57] **ABSTRACT**

The invention concerns a device for suspending side-frames on axle boxes for railway carriages and similar uses, wherein the housings in the side-frames are formed by openings with a central rim defining two side housings, the axle boxes having a generally cylindrical shape with, frontwards and rearwards, a crown forming a rim, rubber beads being pressed in said side housings of side-frames by the said rims of the axle box.

4 Claims, 7 Drawing Figures



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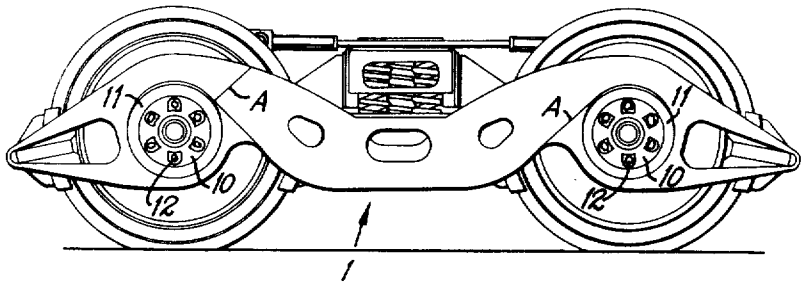
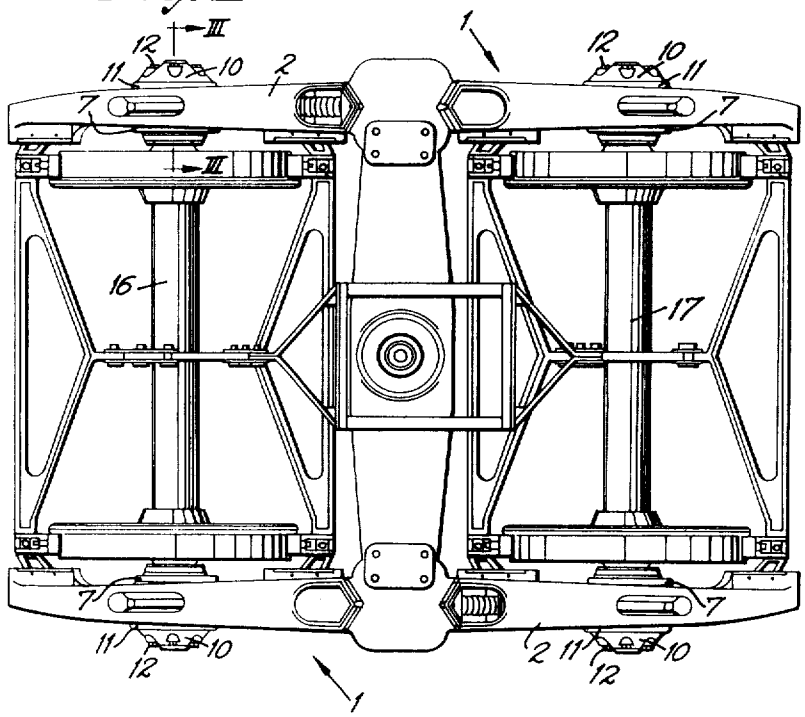


Fig. 1

Fig. 2



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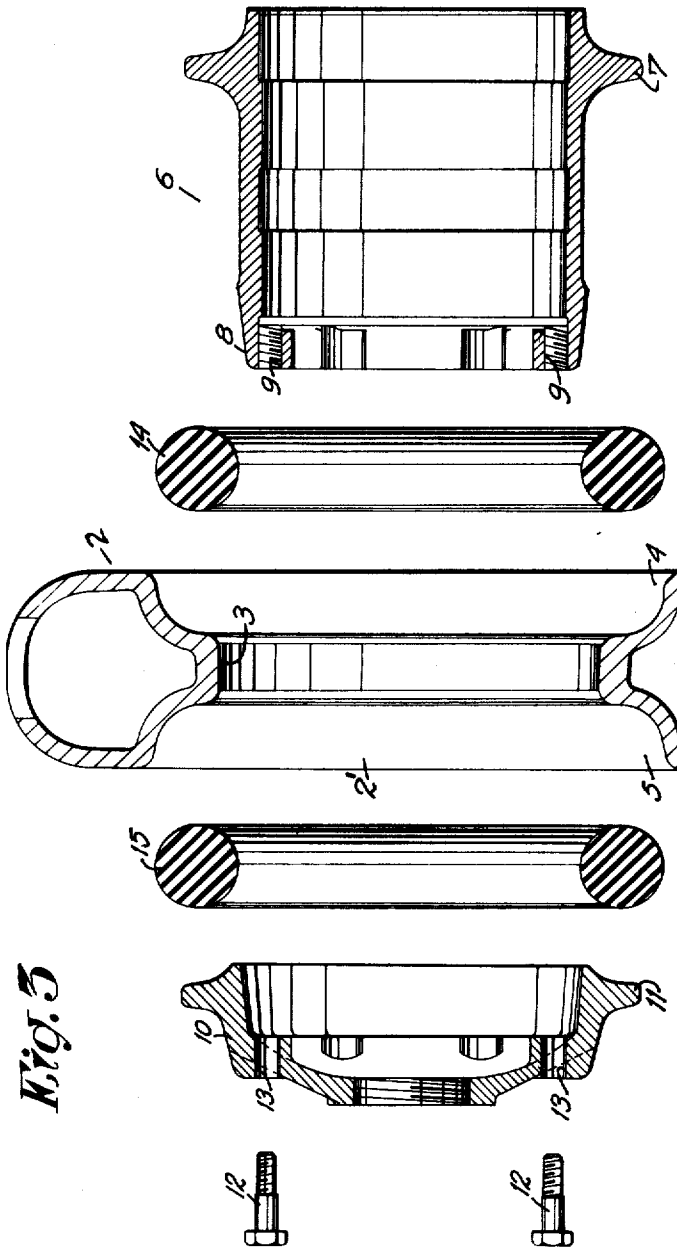

Fig. 5

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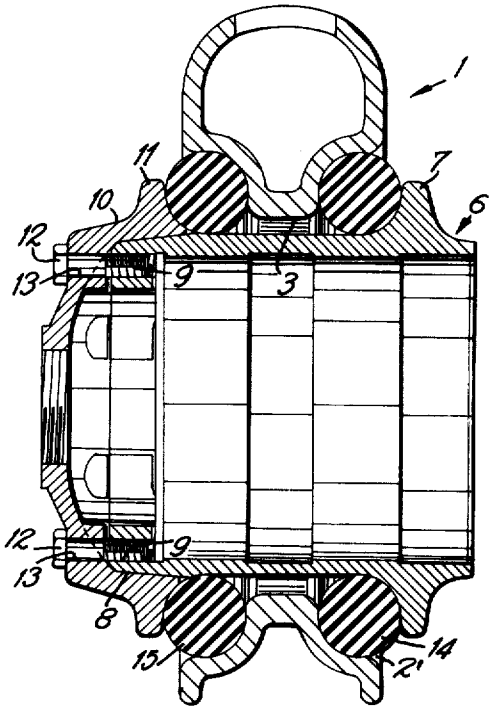

Fig. 4

Fig. 6

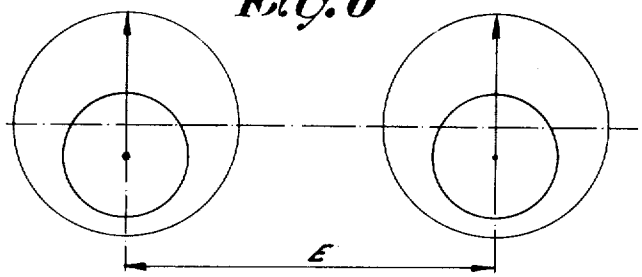

Fig. 7

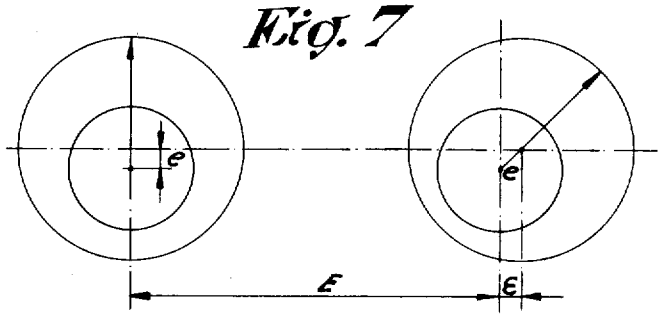

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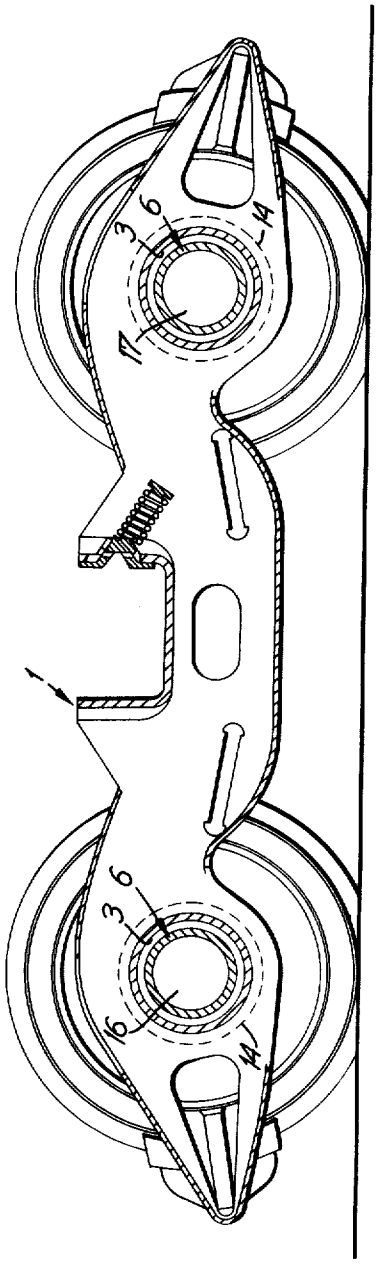
Fig. 5



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DEVICE FOR SUSPENDING SIDE-FRAMES ON AXLE BOXES FOR RAILWAY CARRIAGES AND SIMILAR APPLICATIONS

This invention relates more particularly to bogies the structure of which comprises substantially the combination of two side-frames and a bolster in cast steel or manufactured by any other process.

The object of the invention is to provide such simple suspending device readily mounted and dismantled, reducing substantially the wear and providing a good insulation against the noise and the shocks coming from the wheels rolling on the rails.

Said device is characterized in that the housings in the side-frames are formed by circular openings with a central rim defining two side housings; the axle boxes have generally a cylindrical shape presenting, frontwards and rearwards, a crown forming a rim, rubber beads being pressed into said side housings of the side-frames by said rims of the axle box.

One of said rims of the axle box is a part of a lid which may be removed for mounting and dismantling the suspending device.

The rubber beads may have a variable section so that the parallelism of the axles may be adjusted.

These features may be carried out by very different embodiments readily adapted to each application.

A non limitative example is described hereafter with more details, reference being made to the attached drawings in which:

FIG. 1 shows a vertical section of the essential elements of a bogie using the device according to the invention;

FIG. 2 is a plan view;

FIG. 3 shows an exploded partial section according to line III—III of FIG. 2;

FIG. 4 is similar to FIG. 3, the different elements being shown in the assembled position;

FIG. 5 shows a longitudinal section of a side-frame of the type used in the example of the preceding figures,

FIGS. 6 and 7 show diagrammatically two characteristic positions of the resilient suspending elements according to the invention.

In this embodiment, the side-frames **2** of the car truck **1** have each two circular recesses **2'** the adjoining wall of which is profiled to provide a median rim **3**, thereby defining two side housings **4–5**. The axle box **6** has a cylindrical shape. Rearwards, it has a rim **7**. Frontwards, it has a slightly tapered portion **8** and a number of tapped holes **9** uniformly distributed about the longitudinal axis of the axle box.

A lid **10** having an outer rim **11** is provided to engage the terminal tapered portion of box **6** and to be secured thereto through screws **12** traversing holes **13** of the lid, it being possible to secure it in the tapped holes **9** of the box.

Said device is completed by two rubber torus-shaped beads **14–15** having a suitable section which may be circular.

The chambers **4–5** of the side-frames together with the rims **7–11** respectively of the axle box **6** and the lid **10** have their shapes and sizes conditioned to form together spaces in which are enclosed and secured the rubber beads **14–15**.

In a particular embodiment, the rubber beads **14–15** may readily contribute to adjust or to provide the parallelism between the axles **16–17** of the bogie. For this

purpose, the rubber beads have a varying section, e.g. such that, as seen in plane, the circles respectively having the larger and the smaller diameter defining them are slightly out of center.

For mounting such suspending device, it is sufficient to separate the lid **10** from the axle box **6**, to thread in completely the first rubber bead **14** thereon and then the corresponding portion of the side-frame **1** and, finally, to replace the lid **10**.

The reverse order will be followed for dismantling.

In such embodiment, under the effect of the supported load, the side-frames **2** are compressing the rubber beads **14–15** between the median rim **3** of the circular holes **2'**, the rims **7–11** pressing the latter upon the outer face of box **6**.

This arrangement is such that slight relative movements between the box and the side-frames are still allowed in any direction, whereas said movements are limited and controlled by the return force due to rubber.

There is also produced a damping owing to the internal frictions of the rubber and the rubber-on-steel frictions.

Finally (FIGS. **6–7**), when one of the side frames of the bogie has been cast or manufactured with the box housings spaced on a distance $E+\epsilon$(represented case) or $E-\epsilon$, whereas the opposite side-frame has a correct spacing E, the spacing E of the axles will be readily maintained by pivoting the beads in such direction that the projection of the throwing off center e of the inner circumference of the bead on a horizontal axis is equal or approximately equal to ϵ.

Contrarily, when ϵ is negative, it will be possible to rotate the rubber bead clockwise.

Of course, it is apparent that the maximum value of ϵ may not be greater than the throwing off center of the inner and outer circumferences of the beads.

The advantages of such suspending device are numerous and important. It will be firstly observed that, after a stress or a shock having induced a distorsion of the rectangular structure of the bogie, return forces are originating at the level of the rubber beads, thereby tending to bring the bogie back to its initial rectangular shape.

The flexibility provided by the device for guiding the axles allows to suitably orientate the latter, thereby improving the behavior of the bogie in curves, particularly as regards the slidings at the level of the treads and the contacts of the wheel rim upon the rail.

It will be also observed that a slight primary suspension effect is additionally obtained since the rubber is crushed under the vertical load. The wear of the metallic parts is also systematically prevented at the contact locations with the rubber beads since, in the previous device, the wear results essentially from the steel-on-steel contacts.

For the same reason, the device according to the invention provides a good sound insulation while absorbing the effects resulting from the shocks of the wheels rolling on the rails.

Owing to the cylindrical shape of the axle box, it is then possible to adopt a continuous line with a relatively small curvature for the side-frames, thereby reducing the risks of concentration and tension in the areas indicated in A on FIG. 1.

Still another advantage of said suspending device lies in the use of a box having a very simple shape and relatively reduced sizes, namely a relatively light box.

Finally, still another advantage lies in the possibility of providing a correct parallelism of the axles and the certainty of meeting again said parallelism after resilient distortions.

A profitable consequence of the shape of said side-frames and the safety relating to the relative position of both side-frames is that slideway triangles may be used even for the outer triangles.

In practice, there will be adopted such sizes that, even in the case where the rubber beads would be lost so that the side-frame would rest directly upon the box, it would still be impossible to separate the box from the side-frame as long as the lid of the box is in its position.

A major safety is thereby provided.

The term rubber beads means, of course, any annular element having suitable shape, sizes and material and having a function and a result equivalent to those of rubber beads. The rubber may be natural or synthetic or manufactured from a suitable synthetic resin. The beads may be solid or hollow. In the second case, they will be generally interiorly pressurized.

Finally, said beads may be integral or they may be made in several parts in accordance with the manufacture method and the intended applications.

The invention relates to the suspending device as well as to each of its constituting characteristical parts.

What I claim is:

1. A suspending device for railway carriages, comprising in combination, a cylindrical axle box having front and rear portions, an outer rim upon said rear portion, a lid fixed to said front portion, said lid having an outer rim, a side-frame having a central rim and two curved recesses located on opposite sides of said central rim, said side-frame surrounding said axle box, a rubber bead fitting between the first-mentioned outer rim and one of said recesses and another rubber bead fitting between the second-mentioned outer rim and the other one of said recesses.

2. A device according to claim 1 wherein, the beads are made of natural rubber, synthetic resin or any other suitable material.

3. A device according to claim 2 wherein the resilient beads are solid.

4. A device according to claim 2, wherein the resilient beads have a homogeneous texture.

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