(No Model.)

E. B. MEATYARD.

CAR AXLE BEARING.

No. 301,510. Patented July 8, 1884.

Fig 1

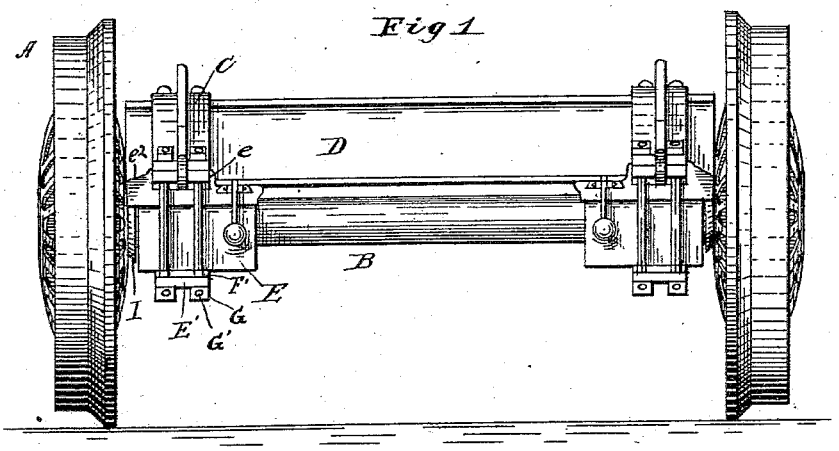


Fig 2

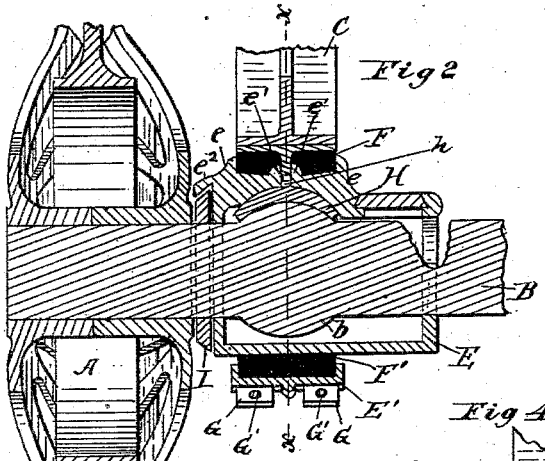


Fig 3

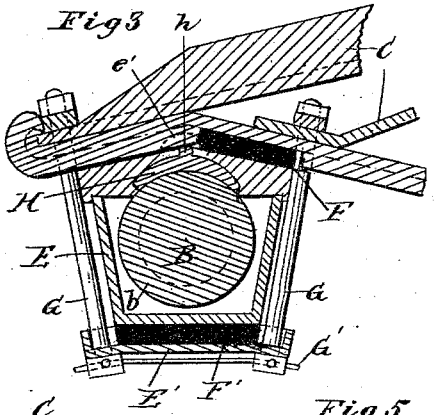


Fig 4

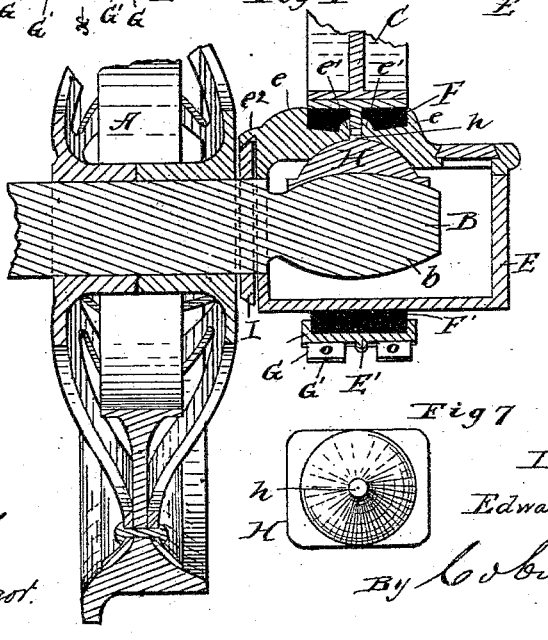
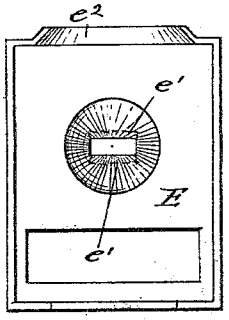


Fig 5



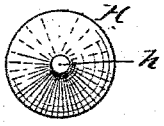


Fig. 6

Fig 7

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UNITED STATES PATENT OFFICE.

EDWARD B. MEATYARD, OF GENEVA, WISCONSIN.

CAR-AXLE BEARING.

SPECIFICATION forming part of Letters Patent No. 301,510, dated July 8, 1884.

Application filed June 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. MEATYARD, a citizen of the United States, residing at Geneva, in the county of Walworth and State of Wisconsin, have invented certain new and useful Improvements in Axle-Bearings for Railway-Cars, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a pair of wheels with axle, side beam, and cross-beam, showing my improvements. Fig. 2 is a vertical section of one wheel and the neighboring parts of the axle and its bearings. Fig. 3 is a section on the line *x x* in Fig. 2, the rib of the side beam being partly broken away, so as to show one of the cushions between which it rests. Fig. 4 is a similar section to Fig. 2, but showing a modified bearing. Fig. 5 is an inside elevation of the lid of the axle-box. Fig. 6 is a plan view of the brass shown in Fig. 2. Fig. 7 is a plan view of the brass shown in Fig. 3.

The same letters denote the same parts in all the figures.

My invention relates to the journal-bearings for railway-car axles, and the objects of it are to provide a substitute for the springs which in ordinary trucks sustain the weight of the car-body, to provide for a rocking of the axle-boxes to accommodate them to the changed positions of the wheels in rounding curves without communicating the jar to the rest of the truck, and, generally, to promote the perfection and durability of the bearing, while diminishing its expense; and to these ends the invention consists, partly, in axle-boxes provided with cushions above and below, and partly in the several devices and combinations of devices which will be fully set forth hereinafter, and definitely pointed out in the claims.

In the drawings, A denotes a pair of wheels, constructed of elastic material between the felly and the axle, on the principle set forth in my application for a patent allowed May 15, 1882.

B denotes the axle, C the side beams, and D the cross-beam, the construction of these forming no part of the present invention.

E denotes the axle-box, which is provided with a doubly-sloping top, as shown in my patent for car-trucks, No. 251,618, dated December 27, 1881, but which differs from the box shown in that patent, in that its front and back walls are at right angles each to the adjacent slope of the top. In the box now shown the slope is confined to that part of the top on which the side beam rests, that part which is farthest from the wheel being flat-topped. On each side of the sloping portion of the top is a rib, *e*, the two ribs forming a groove or seat for a pair of cushions, F, of india-rubber or other elastic and yielding material. About the apex of the sloping part of the top is a slight eminence, *e'*, surrounding a short longitudinal slot, which is cut through the top of the box. This slot receives the rib *c*, which is formed on the under side of the side beam, and rests between the cushions F. A plate, E', arranged under the axle-box, or so much of it as is directly under the side beam, supports another cushion, F', of similar material to F. A flange or rim on the margin of the plate keeps the cushion from shifting. Projecting a little in front and rear of the axle-box, this plate E' is fastened to the side beam through the projecting portions by means of screw-bolts G, two at each end. The side beam is thus firmly secured to the axle-box, and at the same time is kept by the intervening cushions, F and F', from contact or rigid connection with it. By this device, and by the use of the wheel shown in the drawings, I am enabled to dispense with the supporting-springs which are ordinarily placed between the car-body and the wheels. The cushions F and F' also admit of that slight rocking of the axle-boxes which is necessitated by the varying relative positions of the wheels, especially in rounding curves, without jarring the side beams or straining their fastenings to the axle-boxes. The nuts which fasten the bolts G are on the top of the side beam, so that the heads of the bolts, which are square, come below the plate E'. Through each head two holes are drilled in directions at right angles to that of the bolt, (which is parallel with the front or rear wall of the axle-box,) and crossing each other at right angles in the center of the head, so that at every quarter-turn the bolt is brought into a position in which it can be tied to the cor-

responding bolt of the opposite pair by means of a rod, G′, passing through the opposite holes. The directions of the holes are evidently not in line with each other, so that the rods G′ are necessarily bent somewhat in passing through them, and by making the rods of spring-steel I make these bends serve to hold them more tightly in their places. In the ordinary construction the brass or bearing-block H, which is placed between the axle and the top or bearing plate of the axle-box, is thin directly over the axis of revolution, where the pressure and strain and wear are greatest, while before and behind the axis it thickens into a superfluous weight of metal. I remedy this defect by forming the bearing-block with a convex enlargement directly over the axis of revolution, fitting into a corresponding concavity in the top of the axle-box, and diminishing it gradually front and rear on a curve of radius somewhat shorter than that of the axle itself, as shown in Fig. 3. This conformation of the brass also remedies an incidental evil, which has become quite serious in some sections of the country, where it is not at all uncommon for thieves to lift the axle-boxes of cars left standing on the track by means of small jack-screws or equivalent devices, and then slip out the brasses through the apertures in the ends of the boxes. A brass shaped as I have described it cannot be got through the end aperture of the box. In the ordinary construction, also, the diameter of the axle is diminished where it carries the brass, in order to prevent the latter from shifting lengthwise of the axle. The surface of contact is thus made very small. I provide a sufficient bearing-surface of the block on the axle, and also for retaining the former in its place on the latter, by enlarging the axle in that portion of its length, *b*, which turns under the block into the form of the central zone of a sphere, and conforming the inner curvature of the brass or block thereto, as shown in Fig. 2. The retention of the bearing-block in its place is also aided by the pin *h* on the top of its convex enlargement entering the slot which is cut through the rising portion *e′* of the top plate of the axle-box. By thus making the journal absolutely the thickest part of the axle, I obtain a firm bearing, and at the same time avoid any unnecessary weight in any other part of the axle, whereas if the axle is of a reduced thickness on each side of the journal, so as to allow the latter to rise from the depressed portion to a diameter not greater than the rest of the axle, the axle must either be unnecessarily heavy for the greater part of its length or too weak in the part immediately adjoining the journal. The conformation shown in Fig. 4 of the drawings avoids these objections. It, however, makes it necessary to arrange the wheels outside of the axle-bearings. If, for any reason, it is thought best to arrange the wheels between the bearings, the modified form shown in Fig. 4 may be adopted, though I regard that of Fig. 2 as far preferable. In this modification that part of the length of the axle on which the wheels are set is necessarily made somewhat larger than the greatest diameter outside of the wheel, and in order that the least diameter outside the wheel may not be too much reduced the enlargement *b* takes the form of the zone of a prolate spheroid, instead of a sphere. The greatest thickness of the bearing-block is correspondingly increased. The formation of the bearing-blocks and axles which has been described makes it practicable to make the former of less expensive material than brass and obtain equally good service. A washer, I, is shrunk on the axle between the box and the wheel for the purpose of excluding dust from the former. It is beveled, having its least diameter toward the wheel, so as to throw all dust that falls upon it down between it and the wheel. This diversion of the dust is aided by the beveled projection of the hub of the wheel, (shown in Fig. 2 of the drawings,) which, in connection with the washer, forms a sort of gutter, opening at its bottom into the space between the wheel and the washer. A housing, e^2, sloping the same way, projects from the axle-box, covering the junction of the washer and axle-box, and throwing down between the washer and the wheel whatever dust falls on it. The opening in the flat top of the axle-box for inspection and lubrication is covered by a sliding plate, K, which is kept down in its seat by beveled grooves e^3, in which it slides. A downwardly-turned flange at one end prevents it from sliding more than one way, and a gravitation-lever, K′, hinged at the other end, prevents it from accidentally moving that way. The short arm *k′*, which extends above the point where the lever is hinged, coming in contact with the top of the plate, prevents the lever from being thrown over on the plate, and thus insures its always being in an operative position.

I am aware that spherical or spheroidal bearings are not new, such having been heretofore shown in car-axles with the spherical or spheroidal parts of greater diameter than the other parts of the axle, and I do not broadly claim such construction, my object being to provide a universal joint, by means of the spherical journal-bearing block for the axle-box, which will permit the axle-box to rock or oscillate in all directions when used with axles permitted to have a certain amount of lateral movement, as in rounding curves, and in this respect I desire to limit my invention to the peculiarity referred to.

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

1. A railway-car axle provided with a spherical bearing, in combination with a journal-box having a corresponding concavity, and a bearing-block adapted to the convexity of the axle and the concavity of the box, whereby a universal joint is provided, sub-

stantially as described, and for the purpose set forth.

2. The side beam, C, the axle-box E, provided with a grooved top, the plate E′, arranged below the box, means for rigidly fastening the plate to the side beam, the cushions F, arranged in the grooved top, and the cushions F′, arranged between the box and the plate E′, all in combination, substantially as and for the purposes described.

3. The beveled washer I, set close on the axle between the axle-box and the wheel, in combination with the projection e^2 of the axle-box, arranged above the washer, and having a slope corresponding to the bevel of the washer, substantially as and for the purpose described.

4. In combination with an axle-box having a rectangular opening in its top, a cover arranged to slide in guides and provided with a stop-flange at one end, and with a gravitation-lever, arranged as described, at the other end, substantially as and for the purpose described.

EDWARD B. MEATYARD.

Witnesses:

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G. E. FAULKNER.