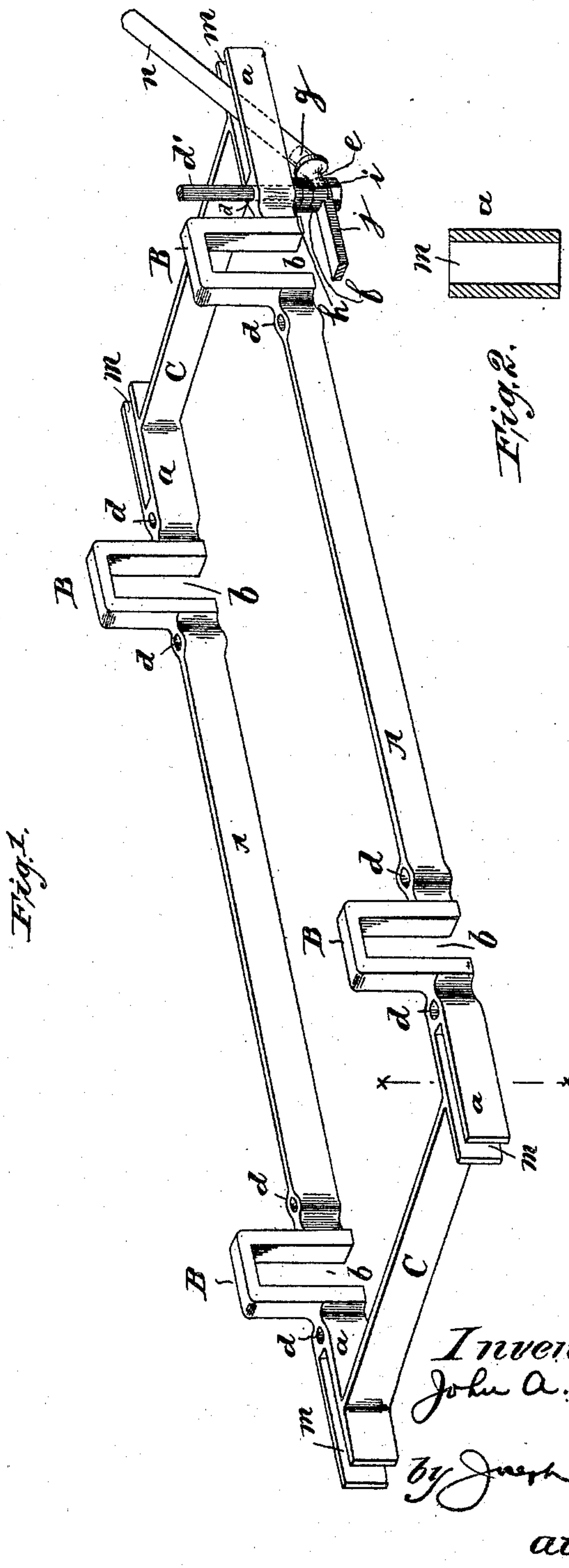


(No Model.)

J. A. BRILL.
AXLE BOX FRAME FOR CAR TRUCKS.

No. 492,525.

Patented Feb. 28, 1893.



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UNITED STATES PATENT OFFICE.

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AXLE-BOX FRAME FOR CAR-TRUCKS.

SPECIFICATION forming part of Letters Patent No. 492,525, dated February 28, 1893.

Application filed July 22, 1892. Serial No. 440,879. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. BRILL, a citizen of the United States, and a resident of the city and county of Philadelphia, and State of Pennsylvania, have made a new and useful Axle-Box Frame for Car-Trucks; and the following, when taken in connection with the accompanying drawings, is such a full, clear, and exact description of my invention as will enable others to practice and use the same.

My invention relates more particularly to street car trucks, and especially such as are in use on electric and cable railways, and the like.

My invention primarily consists of a new article of manufacture, to wit: an axle box frame, as it is called, made in one homogeneous piece, so that in the construction of the frame all bolts, rivets, &c. are dispensed with, and the said frame thus becomes a concrete thing, homogeneous throughout.

My invention further consists in the particular formation of the parts of this frame so that the said frame may be adapted for use upon cars having diagonal braces which pass up from the lower truck trusses or braces, or as usual from the lower part of the outside spring posts, and up to the projecting or overhanging ends of the car body supported on the truck.

Referring to the accompanying drawings: Figure 1 is a perspective view from above, showing my new article of manufacture. Fig. 2 is a cross section on the line $x x$ of Fig. 1.

At the present time it is almost a universal practice and especially in many motor and grip cars it is customary to construct the truck with what is commonly known as an axle box frame, which is a frame made up of two side bars composed of a single or a plurality of juxtaposed members, and lateral bars or braces bolted thereto, the frame being carried either on the tops of the axle boxes, or else being supported from the said axle boxes by suitable links or supports, which may, or may not, be so arranged as to allow the frame to have a lateral motion. Such frames are shown in earlier patents which have been granted to me and to George M. Brill. In some cases springs are interposed between such frames and the tops of the axle boxes for the purpose of furnishing a slight elastic cushion

between the metal of the frame and the metal of the axle box. The object of these axle box frames in a truck structure is to furnish a support which practically has no appreciable motion or no motion of any extent, in relation to the track; that is, motion up and down, or to and away from the ground over which the car is passing. The thing to be supported, or carried, by these axle box frames is either the motor, if the car is to be operated by electricity, or the grip, if the car is to operate in connection with a moving cable. It is also customary on these frames to support the brake mechanism, track sanding devices, &c.

The car springs may, or may not, at their lower ends bear upon the axle box frame. This detail may be arranged in various ways. It is customary, however, to locate the spring posts in such a position in relation to the axle box frame that the spring posts pass down through a hole in the said frame, which hole may be larger than the spring posts to allow of play between them; and if the bottom of the car spring bears upon the upper surface of the frame the lower ends of the spring posts may be suitably braced, and move up and down with the car body through the holes in the said axle box frame.

It is further customary to construct that part of the axle box frame in the shape of a saddle or yoke which embraces the axle box, which saddle is extended outwardly to form seats for the car springs, and through these seats the spring posts pass, they being braced together, the side bars or longitudinal members of the axle box frame being bolted to the saddles. The preferred plan of constructing the said axle box frame is to provide it with inverted U shaped housings or saddles, which embrace the top and side of the axle boxes and serve as guides, in a measure, for the said axle boxes; the spring posts serving, in most cases, as pedestals, in a measure, to keep the axle box frame in proper position. The parts are so co-related when put together that they tend to, and do, mutually preserve their proper relative positions, and preserve the parallelism of the axles.

The common method of constructing such frames before the date of my invention has been to provide two side bars, with or without the saddles or housings, which were either

riveted or made integral therewith, as before set forth. The said two side bars have then been united by cross braces, or lateral beams, extending between them, and which were riv-
 5 eted to the said side beams, thus making up the rectangular axle box frame.

There are certain difficulties in the manufacture of this structure, and there is a certain amount of liability of the bolts which
 10 unite the parts cutting from the continual wear to which the structure is subjected.

Now, my invention consists in forming this axle box frame as one single homogeneous piece of metal, having the housings the side
 15 bars and the lateral braces formed of one solid forging, or by casting, as hereinafter set forth.

I may form my new axle box frame either of wrought iron forged into shape; or I may
 20 form it from mild cast steel, and give it the desired shape by casting, my present invention not relating in any way to the methods of forming the new article herein described. I however prefer to forge the same.

25 Figure 1 shows a perspective view of an axle box frame constructed in accordance with my invention.

A, A, are the side beams; B are the housings or saddles; *b* shows openings in the hous-
 30 ings within which the axle boxes are located.

C are the lateral members, and there may be any number of these lateral members extending between the side bars at any desired point; *d* shows the openings adjacent to the
 35 saddles through which the spring posts *d'* may pass; and the car springs may, if desired, rest on the upper surface of the axle box frame about the hole through which the spring posts pass which is enlarged for this purpose.

40 Hitherto, so far as I am aware, no axle box frame has ever been made as a homogeneous piece, but that have always been constructed of parts bolted or riveted one to the other. I have found it highly advantageous to form
 45 this frame as a single piece, as shown in the drawings, the cross members C being formed homogeneous to the side members A of the frame, and the housings B being made homogeneous with the side pieces. The article
 50 produced in this way is superior to any of the structures that have hitherto been produced, as it possesses both the advantages of use and is advantageous in construction. The parts can never get out of line, if of sufficient strength, and there are no rivets or bolts,
 55 to be worn out or cut through.

Although the preferred form shows the internal saddles or housings as being present in the structure, I do not limit myself to them
 60 as the substance of my invention will be present without them.

The second part of my invention consists of the same article that has been previously described, but in which the ends *a* of the side
 65 beams A which are extended beyond the saddles are provided with the slots *m*, as clearly shown in Figs. 1 and 2 of the drawings. The

purpose and object of making the end A of the frame bifurcated, as shown, is to enable the frame to be used upon those cars wherein
 70 a brace passes up from the lower member of the truck frame to the car body, such as is shown in the patent to J. A. Brill and G. M. Brill, No. 430,418, June 17, 1890, in which said
 75 brace passes from the lower portion of the outer spring posts to the car.

At *d'* I have indicated one of the spring posts without the car spring, and have shown the brace at *n* passing upward from the spring posts *d'* through the bifurcation in the end of
 80 the axle box frame. In practice usually four of these braces *n* are used. It is usual, where this class of brace is used to provide a thimble, such as *e*, the rear end *f* of which is apertured to permit the spring post to pass through
 85 it, the forward end being provided with a preferable cylindrical boss *g* (shown in dotted lines) upon which the brace *n* rests and to which it is secured in any desired manner. The brace *n* is usually tubular in cross sec-
 90 tion, so I have shown the boss *g* so for apparent reasons, but any contour or shape of either boss, or brace can be used. Between the thimble and the side beams can be interposed elastic or other washers *h, i*, to act as users or
 95 cushions, and from the post *d'* the pedestal tie-bar *j* can be, all of which structure is not new in the present case. As these braces *n* at their upper ends unite with the car body, and at their lower ends connect with the spring
 100 posts, they of course have all the up and down motion of the car body; and as the axle box frame has practically no up and down motion, or only such as it may get by reason of the existence of the rubber washer, or thin
 105 spring, between the housings and the axle box, it is clear that provision must be made, first, for the running of the braces *n* upward; and second, for the movements of the braces
 110 *n* in relation to the axle box frame, which is, when compared with the movements of the car body, relatively stationary, so far as up and down motions are concerned.

The object of carrying out the axle box frame beyond the outer spring posts, as shown
 115 in the drawings, is to enable fenders to be secured thereto in front of the wheels, or springs, when desired, to be used in connection with such ends, and between such ends of the axle box frames and the car body, as
 120 is clearly shown in the patent of G. M. Brill, No. 478,218, dated July 5, 1892, and for many other purposes.

My main invention, to wit, the new article of manufacture consisting of an axle box
 125 frame of a single homogeneous piece, is not limited to a frame so extended; but the second part of my invention, to wit, an axle box frame having solid side bars (as distinguished from a plurality of bars) extended beyond
 130 the outer spring posts at each end, and bifurcated, is in this regard limited to that class of structure in which it is desirable to extend the ends of the axle box frame for the pur-

pose of supporting elliptic or other springs between the car body (or upper chord if one is used) and the extended ends of the axle box frame, or for any other purpose.

5 The spring posts *d'* may be secured to the sills of the car, or to the upper cord, as in the patent of July 5, 1892, to G. M. Brill before referred to.

10 What I claim, and desire to secure by Letters Patent, is—

1. An axle box frame made into a single homogeneous piece of metal, and comprising longitudinal members, axle-box housings or saddles having their bearing surfaces within
15 the plane of the web of the longitudinal members, and a transverse member or members, the union of the longitudinal members being made at or near their ends, substantially as described.

20 2. An axle box frame formed into a single homogeneous piece of metal having housings for the axle boxes formed integral with the longitudinal members, which are intermitted about the housings, the tops of the housings
25 lying above the plane of the longitudinal members, the housings being open between said intermitted portions, and a lateral member or members formed integral with the said longitudinal members, substantially as described.

3. An axle box frame formed into a single homogeneous piece of metal having longitudinal members, the lateral members uniting the
35 longitudinals at or near the ends thereof without the use of a central bolster or transom; the ends of the longitudinal member being bifurcated, substantially as described.

4. An axle box frame formed of one piece of metal, having housings for the axle boxes
40 formed integral with and extending above the longitudinal members, which are intermitted about the housings and a lateral member or members formed integral with the said longitudinal members, the ends of the longitudinal members being bifurcated, substantially as described.

5. An axle box frame having side beams, said side beams having extended ends formed
50 in one solid piece and bifurcated, the bifurcated ends being transversely united substantially as described.

6. An axle box frame having side beams, said side beams being formed of one solid piece, having integral housings, the side
55 beams being intermitted about the housings and having bifurcated extended ends, substantially as described.

7. An axle box frame formed of one homogeneous piece of metal, having integral axle
60 box housings between its ends, the frame being intermitted about the housings which extend above the frame, and integral lateral members extending between said ends, substantially as described.

8. An axle box frame, having side beams, housings on said side beams, and lateral members uniting the side beams between the ends

and the housings, said side beams, housings, and lateral members being formed into one single homogeneous piece of metal, substantially as described. 70

9. An axle box frame, having side beams, housings on the side beams, the side beams extending past the housings, and lateral members uniting the side beams between the ends
75 and the housings, the extensions of the side beams being bifurcated, substantially as described.

10. An axle box frame, having side beams and cross uniting members all made into one
80 single homogeneous piece of metal, the side beams having housings between its ends integral therewith, said beams being bifurcated, said housings being between the bifurcated ends of the side beams substantially as described. 85

11. An axle box frame, having side beams and cross uniting members all made into one single homogeneous piece of metal, the side
90 beams having bifurcated ends between which the cross uniting members extend, substantially as described.

12. An axle box frame, having side beams and a cross uniting member or members all made into one single homogeneous piece of
95 metal, the side beams having integral housings between its ends, and spring post apertures adjacent to said housings, substantially as described.

13. An axle box frame in which the side
100 beams, cross uniting members, and axle box housings are formed of one piece of metal, the side beams being intermitted about the housings which form openings or axle box bearing surfaces between the intermitted ends of the
105 side beams, substantially as described.

14. An axle box frame having side beams, housings on the side beams, the said side beams extending past the housings, and lateral members uniting the side beams between
110 the ends and the housings, the side beams, housings, and lateral members being formed of one piece of metal, substantially as described.

15. An axle box frame having side beams,
115 housings on the side beams, the side beams extending past the housings, spring post apertures in the side beams adjacent to the housings, lateral members uniting the side beams between the ends and the housings, the
120 side beams, housings, and lateral members being formed of one piece of metal, substantially as described.

16. An axle box frame having side beams intermitted at certain points between its ends,
125 within the intermitted portions of which lie axle box housings or yokes, the side beams extending past the housings, and lateral members uniting the side beams between the ends and the housings, the side beams, housings,
130 and lateral members being formed of one piece of metal, substantially as described.

17. The axle box frame having the side beams A, and housings B, spring post apertures *d*

adjacent to said housings, the side beams being enlarged about said apertures to form supports for superposed springs, substantially as described.

- 5 18. The axle box frame having the side beams A, and a cross uniting member or members lying in the same general plane, axle box housings or yokes on the side beams, the bearing surfaces of which extend beyond said
10 plane, either above or below, the side beams being intermitted about said housings, all of which are formed into a single homogeneous piece of metal, substantially as described.

19. The axle box frame having the side beams

A, the housings B extending above the side 15 beams, which are there intermitted, the open yoke of the housings being between the intermitted ends of the side beams, spring post apertures *d* adjacent the housings, and cross uniting members, all in one homogeneous piece 20 of metal, substantially as described.

Signed at the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, this 20th day of July, 1892.

JOHN A. BRILL.

Witnesses:

R. S. REED,
BENJ. C. WILSON.