(No Model.) 2 Sheets—Sheet 1.

W. B. SMITH.

CAR AXLE BEARING.

No. 444,943. Patented Jan. 20, 1891.

Fig. 1.

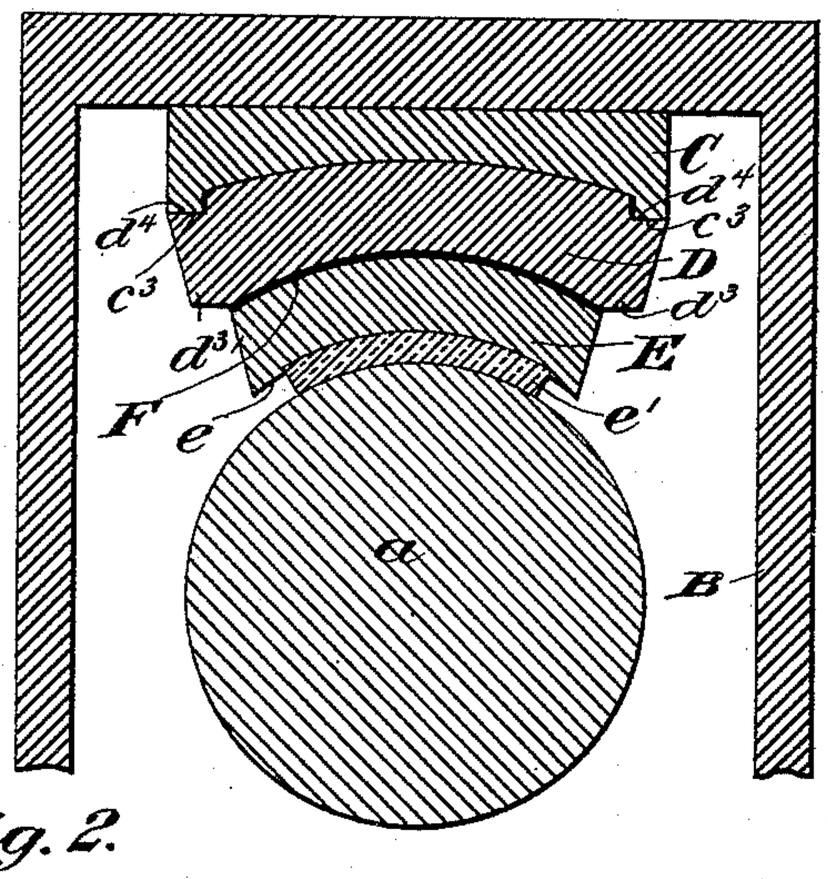
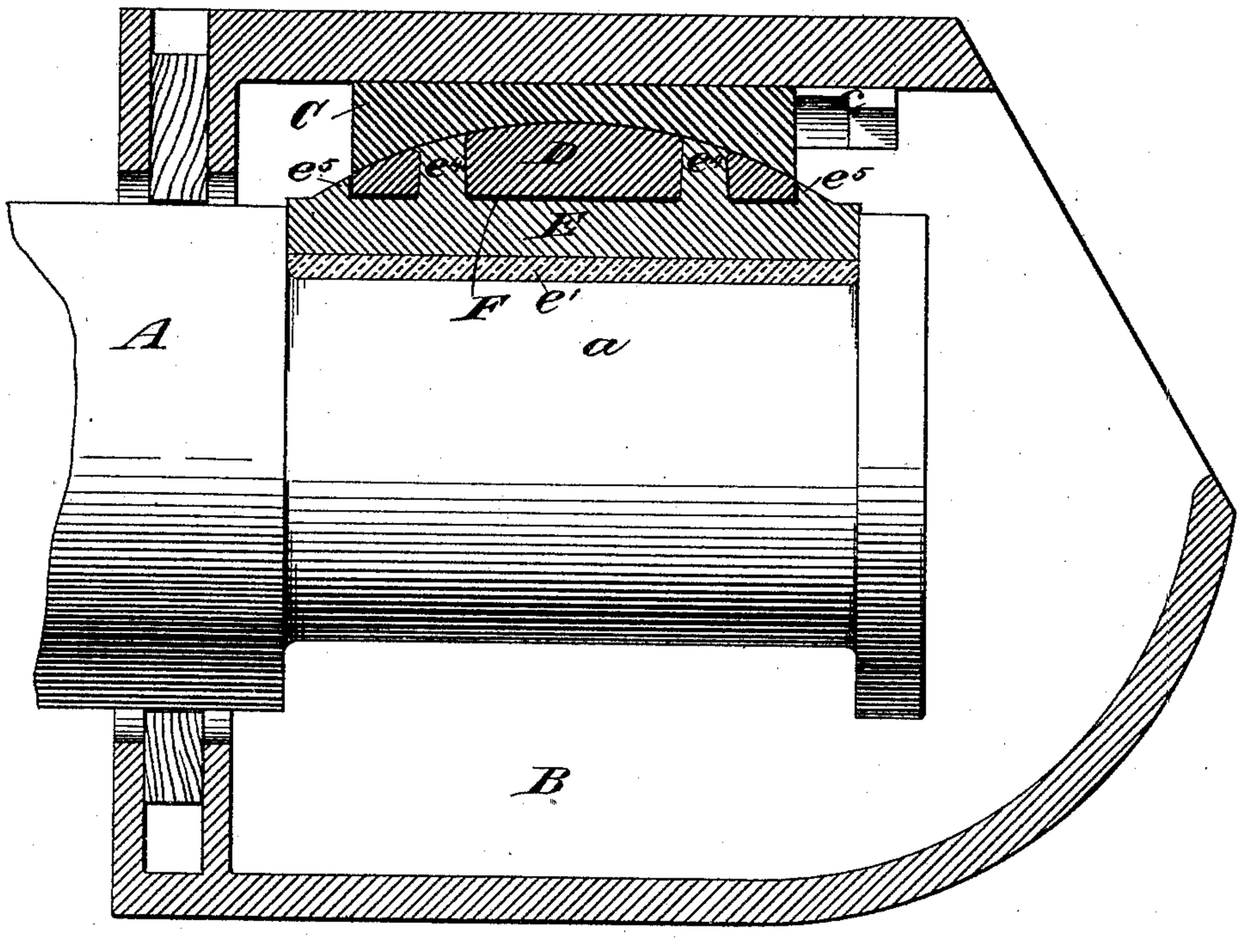


Fig. 2.



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George Barry

Inventor:-
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Brown & Seward

(No Model.) 2 Sheets—Sheet 2.

W. B. SMITH.

CAR AXLE BEARING.

No. 444,943. Patented Jan. 20, 1891.

Fig. 3.

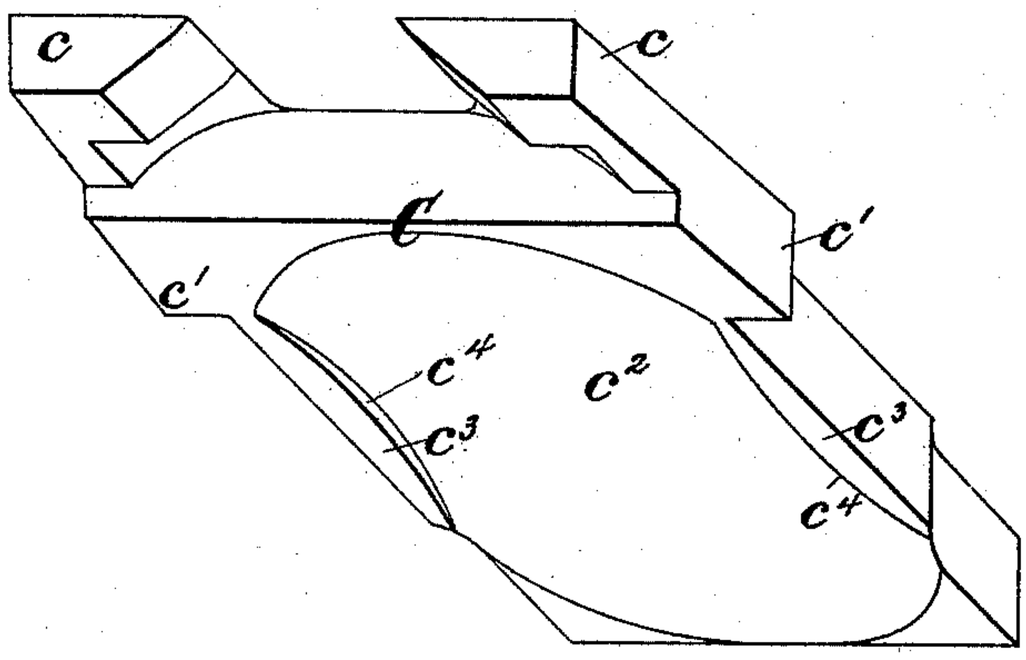


Fig. 4.

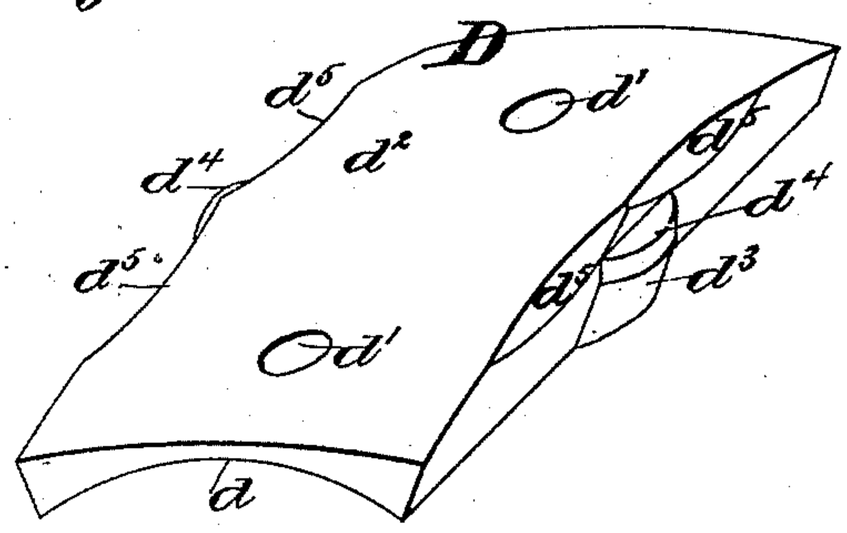
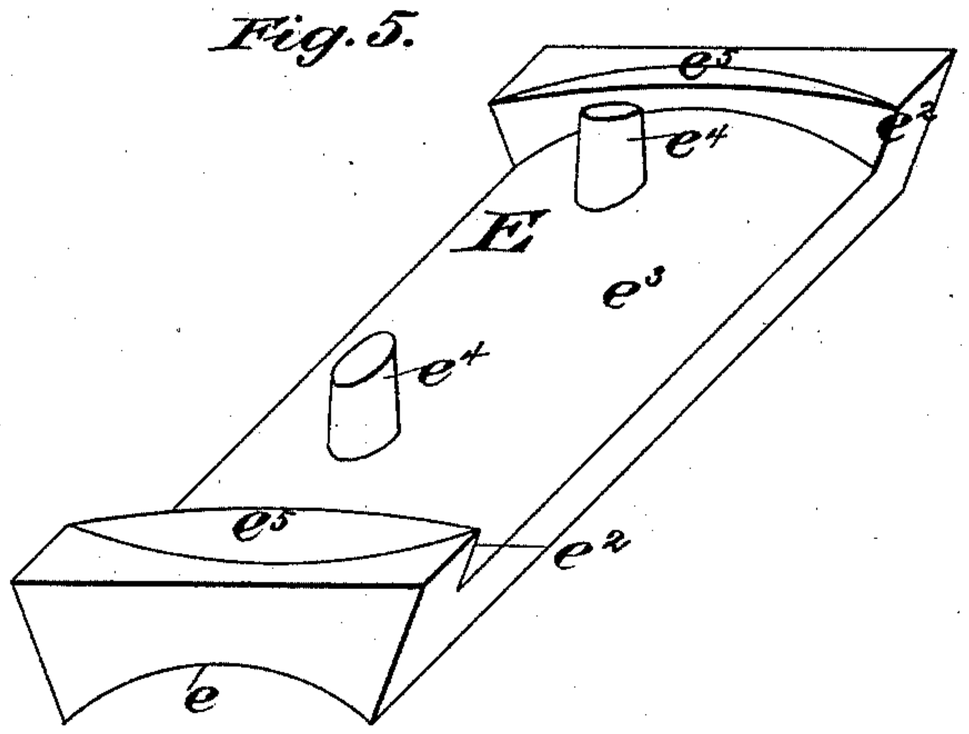


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM B. SMITH, OF ATLANTA, GEORGIA, ASSIGNOR OF ONE-HALF TO GEORGE W. McCARTY, OF SAME PLACE.

CAR-AXLE BEARING.

SPECIFICATION forming part of Letters Patent No. 444,943, dated January 20, 1891.

Application filed July 3, 1890. Serial No. 357,656. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. SMITH, of Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Improvement in Car-Axle Bearings, of which the following is a specification.

My invention relates to an improvement in axle-box bearings, and more particularly to box-bearings for use in connection with railroad-car axles. It often happens, owing to irregularities of the rails or to some slight distortion of the axle spindle or box which supports the car upon the spindle, that the spindle is caused to rotate in other than a true circular path about the longitudinal axis of the axle or to slightly tilt in a vertical plane. The former of these two results quickly heats or cuts out the bearings, or both, and the former gives the car a disagreeable rocking motion. Attempts have hitherto been made to overcome the disagreeable effect of the tilting of the axle because of the irregularities in the rails by providing a socket-bearing which would admit of a certain amount of play between the bearing-sections in a vertical plane. It is, however, desirable that the bearing-sections should have play not only in a vertical but also in a horizontal plane, in order at one and the same time to provide for both the tilting and the irregular rotary movement of the spindle, and it is further desirable that the bearing-sections should have no bodily lateral movement relatively to one another, as such movement would tend to pitch the spindle out of position relatively to the "brasses" and cause overheating or injurious wear in a very short time.

The object of my present invention is to provide means for the attainment of the above-stated desirable results and to further provide against the sharp impact of hard metal sections upon one another under the weight of the load carried.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical transverse section through the spindle, the box, and the bearings. Fig. 2 is a longitudinal section through the same. Fig. 3 is a view in perspective of the upper section of the bearing. Fig. 4 is a view in perspective of the middle section of the bearing, and Fig. 5 is a view in perspective of the lower or brass section of the bearing.

A represents the axle, and *a* one of its spindles or journals, upon which the bearings which support the car and its load rest.

B represents one of the boxes, of any well-known or approved construction.

The bearings are formed in three sections denoted by the letters C, D, and E, which for convenience I will designate as the "outer," "middle," and "inner" or brass section, respectively. The inner or brass section is provided with a curved face *e*, extending longitudinally thereof and adapted to conform to the curve of the spindle or journal *a*. Its curved face is provided with a lead facing *e'*, as is usual, and at its opposite ends the metal projects upwardly from its back, forming the retaining-shoulders e^2. The depressed portion e^3 along the back of the brass between the shoulders e^2 is provided with upwardly-projected retaining-studs e^4.

The middle section D is formed of hard metal—cast-iron, for example—and is made of such length as to fit between the shoulders e^2, its lower faces *d* being curved to fit the curve of the depressed portion e^3 of the brass, and it is provided with perforations *d'*, so located as to receive the studs e^4 therethrough. It may be secured to the brass by upsetting the ends of the said studs e^4. The upper surface d^2 of the section D is of curved form, the same being a portion of the surface of a sphere, and in order to make such curved surface as long as possible in the direction of the length of the axle the upwardly-extended ends of the brass are provided with curved-faced projections e^5, which form a continuation of the surface d^2 of the section D. The surface d^2 is essentially the bearing-surface between the sections C D of the bearing, and it is important that this should be extended as far as possible in order to distribute the weight as evenly as may be throughout the length of the brass E. The opposite sides of the sections D lie in the extended planes of the sides of the brass E and are centrally provided with rounded-faced lugs d^3, which

stop short of the upper face of the said section D, their upper ends d^4 forming stops to prevent the lateral pitch or displacement of the bearing-sections under the side impulse of the spindle, as when the brake is applied to the wheel or under the forward and backward jerking of the car. The opposite upper edges of the section D are further cut away, as shown at d^5, upon opposite sides of the lugs d^3 to allow the play of the bearing-sections in a horizontal plane and to prevent cramping.

The section C is fitted with a flat upper face, which fits against the top of the box, and with suitable recessed lugs c and shoulders c' for retaining the section securely in position when engaged with the lugs on the inside of a box—such, for example, as those in ordinary use. The under face of the said section C is provided with a curved-faced recess c^2, which corresponds to and is adapted to rest upon the convex-curved face d^2 of the middle section D. At the opposite sides of the concave face c^2 the section C is provided with downwardly-projecting ribs or lips c^3, the inner faces c^4 of which are curved convex toward the center of the surface c^2. The middle portions of the curved faces c^4 of the ribs or lips c^3 are adapted when the parts are assembled to overlap and engage the opposite sides of the section D, with the lower faces of the ribs or lips c^3 in proximity to the upper ends d^4 of the lugs d^3.

From the above construction it follows that when the axle tends to tilt in a vertical plane the section D will move relatively to the section C in a direction lengthwise of the axle, and the tilting motion of the axle will not be communicated to that extent to the car-support. Furthermore, any distortion of the spindle or journal a which will cause it to rotate in an irregular path will be compensated for by the rocking of the section D in a horizontal plane within its seat in the section C in connection with its rocking movement in a direction lengthwise of the axle, and at the same time there can at no time occur a displacement of the bearing-sections relatively to one another because of the engagement of the curved faces c^4 of the ribs or lips c^3 with the opposite edges of the section D and the further engagement of the lower edges of said ribs or lips c^3 with the ends d^4 of the lugs d^3.

To provide against the hammering of the section D against the brass and the injurious effects which naturally follow therefrom, I insert a sheet or facing F, of lead or other suitable soft metal, between the under face of the section D and the depressed portion e^3 of the brass E. This may be molded to the face of one of the sections, or it may consist simply of a sheet interposed and held in position by the studs e^4 and the shoulders e^2.

What I claim as my invention is—

1. In axle-box bearings, the combination, with the brass section fitted to the spindle or journal and a stationary section secured to the box, of an intermediate section secured to the brass, the said intermediate section and the stationary section secured to the box being provided the one with a convex surface and the other with a concave surface adapted to conform to and seat upon the said convex surface of the other, one of the said sections being further provided with inwardly-curved-faced ribs or lips which engage the opposite sides of the other section and permit a limited rocking movement in a horizontal plane and at the same time prevent lateral displacement of the sections, substantially as set forth.

2. In axle-box bearings, the combination, with the brass section fitted to the axle or journal and a stationary section secured to the box and provided with a concave seat and with depending ribs or lips at the opposite sides of the seat, the depending ribs or lips having inwardly-curved faces, of an intermediate section fixed to the brass and provided with a convex bearing-face adapted to conform to the said concave seat, the said intermediate section being further provided with lugs at its sides to form stops against the lateral displacement of the sections and having its upper edges cut away to afford play and prevent binding, substantially as set forth.

3. In axle-box bearings, the combination, with the brass section and the section fitted to the box, of an intermediate section fixed to the brass section, the said intermediate section being provided with a convex bearing-face, the ends of the brass being provided with upwardly-extending curved-faced projections at its opposite ends, which form continuations of the curve of the intermediate section, substantially as set forth.

4. In axle-box bearings, the combination, with the brass and the section fitted to the box, of the intermediate section fixed to the brass and provided with a seat for the section fitted to the box and an interposed layer of soft metal between the intermediate section and the brass, substantially as set forth.

WILLIAM B. SMITH.

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