No. 797,600. PATENTED AUG. 22, 1905.

S. OTIS.

JOURNAL BOX.

APPLICATION FILED APR. 25, 1903.

Fig. 1.

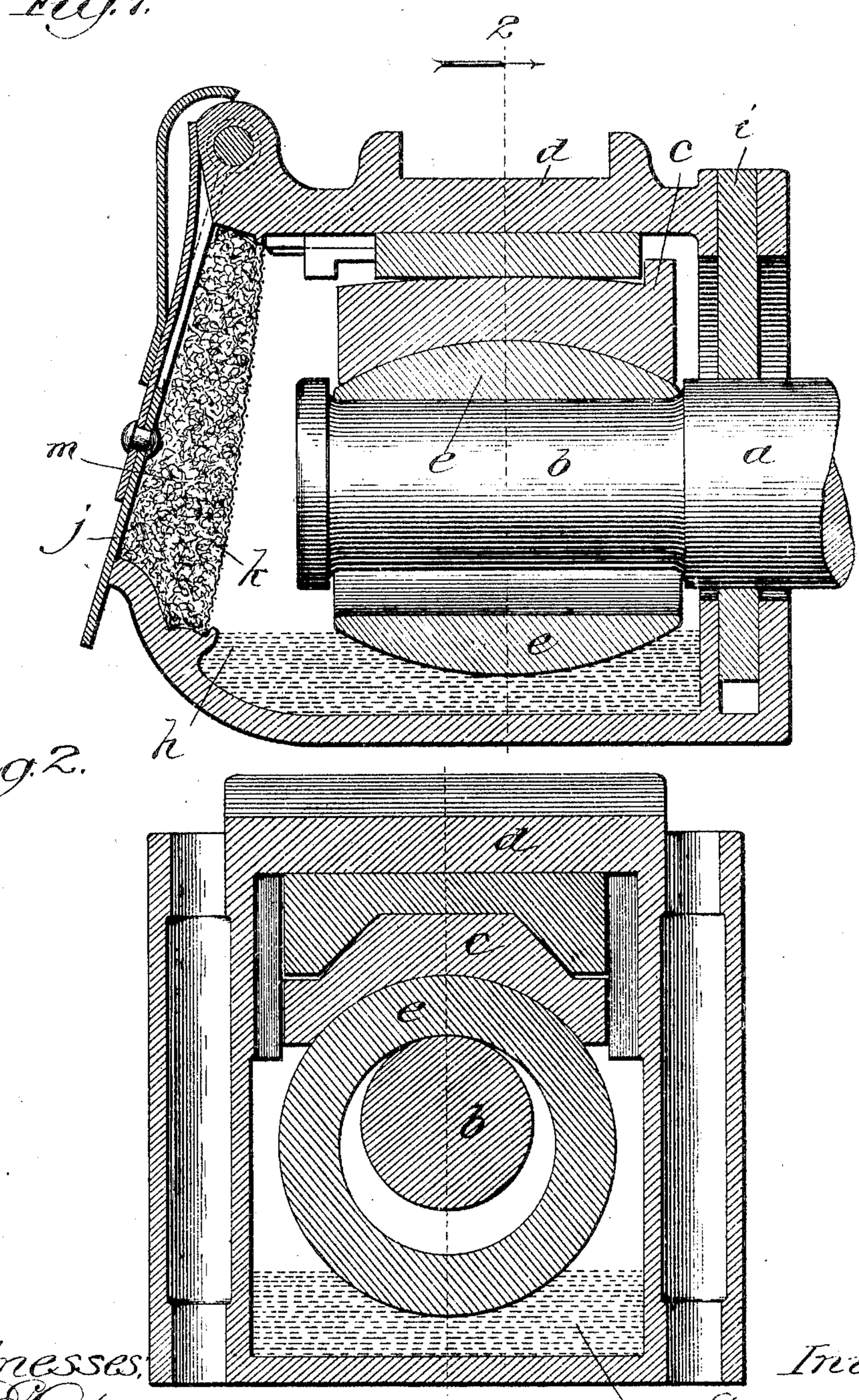

Fig. 2.

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JOURNAL-BOX.

No. 797,600 Specification of Letters Patent. Patented Aug. 22, 1905.

Application filed April 25, 1903. Serial No. 154,316.

To all whom it may concern:

Be it known that I, SPENCER OTIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Journal-Boxes for Car-Trucks, of which the following is a specification.

This invention relates to that class of mechanisms known as "journal-boxes" for car-trucks of railway-cars and used in connection with and so as to form a rotatable bearing for the journal of the axle, all of which will more fully hereinafter appear.

The principal object of the invention is to provide a simple, economical, and efficient rotatable bearing for a car-axle.

Further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists principally in a journal-box for railway-cars in which there are combined a car-axle having a journal portion, a journal-box therefor, and a rotatable bearing-ring provided with a parti-spherical outer surface arranged between it and the journal-box.

The invention consists, further and finally, in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of one end of a car-axle, showing the oil and journal box and other mechanisms hereinafter set forth; and Fig. 2, a cross-sectional view taken on line 2 of Fig. 1 looking in the direction of the arrow.

In the art to which this invention relates it is well known that various devices and expedients have been and are still being tried for the purpose of minimizing the development of frictional force between the journal of the car-axle and the support of the boxes thereon.

The principal object of this invention, therefore, is to provide a car-axle journal with a simple, economical, and efficient rotatable bearing-ring loosely fitted thereon and provided with a parti-spherical outer surface dipping into the oil of the oil-box, so as to carry the same up and into engagement with the bearing-surfaces, all of which will more fully hereinafter appear.

In illustrating and describing these improvements I have only illustrated and will here describe that which I consider to be new, taken in connection with so much of the older mechanisms as will properly disclose the invention and enable those skilled in the art to practice the same, leaving out of consideration other and well-known mechanisms which if set forth herein would only tend to confusion, prolixity, and ambiguity.

In constructing a journal-box and other parts in accordance with these improvements I use the old and well-known car-axle *a*, having a journal portion *b* at or near each end, upon which the entire weight of the car-body rests. As above suggested, it is well known that owing to the tremendous weight that rests upon the journal portions of car-axles of this type a great frictional force or resistance is developed and that as a consequence of this development the "brasses" wear out with great rapidity. In order to overcome these objections and provide a simple mechanism as a substitute therefor, and at the same time a mechanism which can be made and maintained as cheap, if not cheaper, than the older mechanisms, is one of the principal objects of this invention. To obtain this result I provide what may be termed a "brass" portion *c*, made in a measure similar to the older type of brasses, upon which the oil or journal box *d* rests in any usual manner. Instead, however, of making this part *c* of brass, as herein set forth, it may be made of cast-iron, and I prefer to make it of such material for reasons that will hereinafter appear. Arranged between this portion *c*, which may be termed a "non-rotatable" bearing portion, and surrounding the axle portion is a rotatable steel bearing-ring *e* of a diameter considerably larger than the diameter of the journal, so that when it is in position it not only touches the axial journal at the upper point, but the concave surface of the non-rotatable bearing throughout such surface. It will also be seen that such rotatable bearing-ring dips down into the oil in the lower part of the box portion, so that as the parts revolve—as they do with great rapidity during the movements of the train—centrifugal force and adhesion will carry up a sufficient quantity of the oil to lubricate the bearing-surfaces of both the non-rotatable bearing portion and the rotatable journal.

As is well known in this art, there should be more or less flexibility to the parts—that is, the car-axle should not only have a rotary motion, but if possible it ought to have lateral movements within slight limits—that is, one end of the car-axle should be allowed to rise while the other rests on the track, owing to the inequalities of the track or other parts, or one end of the axle might be retarded with relation to the other when a car is taking a curve without in any way disarranging or having a deteriorating effect on the other parts. To accomplish this result, the exterior surface of the rotatable bearing-ring is made substantially parti-spherical—that is, if the ends were not cut off, as shown in Fig. 1, the entire bearing-ring might partake largely of the shape of a sphere, though of course it will be understood that the outlines of a true sphere might be departed from in one direction or another so as to resemble an elliptical spheroid or egg. The non-rotatable bearing portion *c* is likewise concaved to fit the parti-spherical surface of the rotatable bearing-ring, thus permitting the axle to have slight lateral as well as rotary movements.

From the foregoing description and an examination of the drawings it will be seen that when the average of the superficial contact of the parts in this invention is taken into consideration a greater superficial contact exists between these bearing portions than in the usual car-axle journal, so that in this respect the frictional force or resistance is taken care of or divided over a larger area than usual. In other words, this mechanism provides for the distribution of this objectionable resistance over a greater surface than is possible with the devices now in use.

It is desirable to keep dust from entering into the oil-chamber *h*, and in order to provide for such contingencies the usual dust-block *i* is provided at the rear of the journal-box, and the front of such box inside the usual door portion *j* is provided with a wire mesh or screen *k*, between which and the door alluded to a piece of oil-waste *m* may be inserted.

I claim—

1. In mechanisms of the class described, the combination of a car-axle having a journal portion, a journal-box, a non-rotatable bearing portion therein, and a rotatable bearing-ring of larger diameter than the axle-journal provided with a parti-spherical exterior surface and extending between the axle-journal and the non-rotatable bearing forming a rotatable and oscillating bearing member adapted to support the journal-box and permit the oscillation of the opposite ends of the journal portion of the axle with relation to such journal-box, substantially as described.

2. In mechanisms of the class described, the combination of a journal-box, a car-axle having a journal portion, a non-rotatable bearing portion removably mounted in such journal-box, and a rotatable bearing-ring of larger diameter than the axle-journal provided with a parti-spherical exterior surface and extending between the axle-journal and the non-rotatable bearing-block, such ring forming the sole and only point of connection between the journal and the non-rotatable bearing and providing a bearing member adapted to permit the oscillation of the journal with relation to the non-rotatable bearing portion, substantially as described.

3. In mechanisms of the class described, the combination of a journal-box provided with a non-rotatable bearing-block mounted therein, having a concave bearing-surface, a car-axle journal in such box, and a single rotatable bearing-ring of larger diameter than the car-axle journal provided with a parti-spherical exterior surface and extending between such axle-journal and the non-rotatable block, such ring forming the only point of support of the journal-box upon the journal and permitting the oscillation of the journal with relation to the journal-box and its non-rotatable bearing-block, substantially as described.

4. In mechanisms of the class described, the combination of a journal-box, a non-rotatable bearing-block formed of cast-iron removably secured therein, a car-axle journal in such box, a rotatable steel bearing-ring of larger diameter than the axle-journal provided with a parti-spherical exterior surface arranged between the axle-journal and the non-rotatable bearing-block, substantially as described.

5. In a car of the class described, the combination of a car-axle having a journal portion, a journal-box provided with a non-rotatable bearing, and a bearing-ring having a smooth bearing-surface encircling the journal and curved longitudinally of the journal, such ring forming the only connection between the non-rotatable bearing and the journal and permitting the oscillation of the opposite ends of the journal with relation to the non-rotatable bearing.

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