S. R. HUGHES.

Car-Axle Boxes.

No. 152,377. Patented June 23, 1874.

Fig. 1

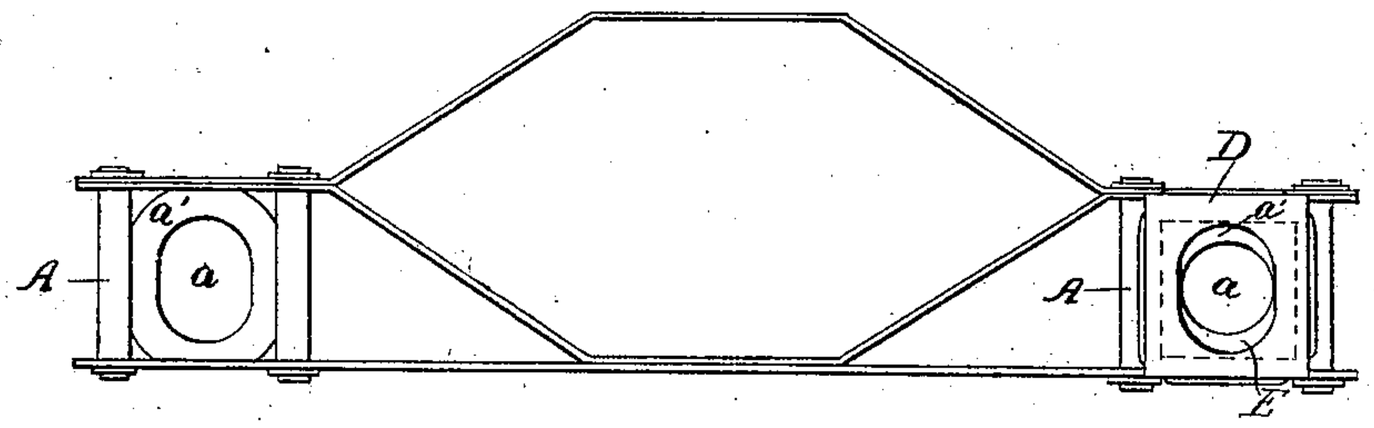


Fig. 2

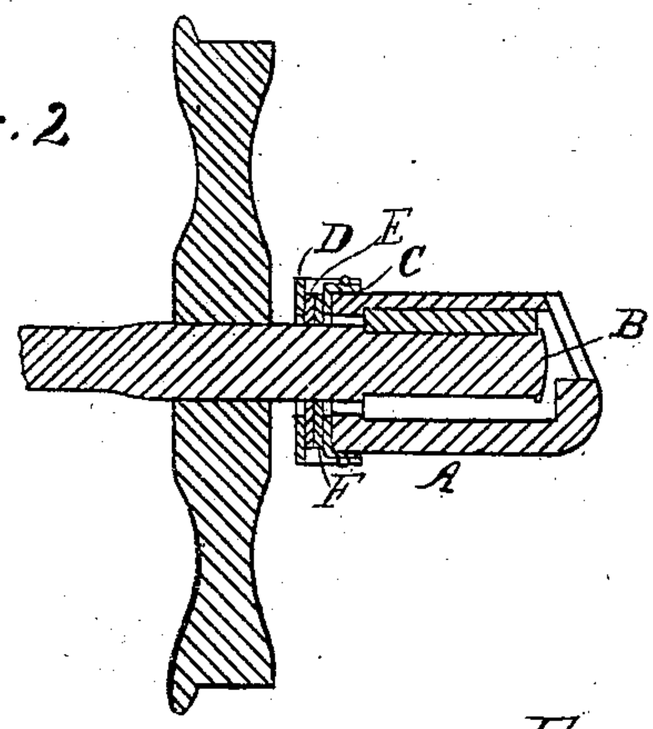


Fig. 3

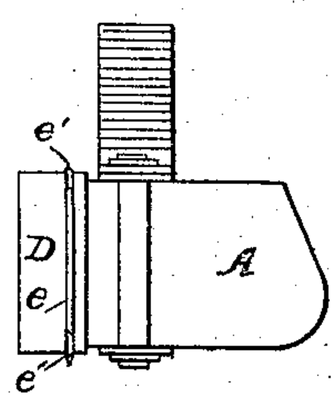


Fig. 4

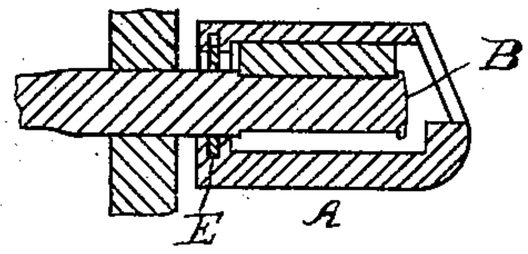
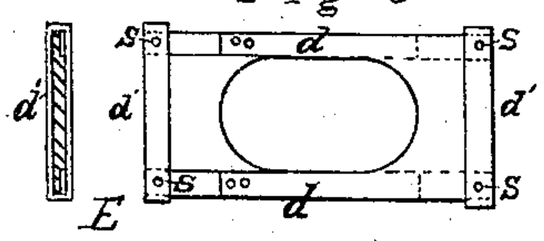


Fig. 5



WITNESSES.

John H. Taylor

Frederick A. Herring.

INVENTOR.

Samuel R. Hughes

By Ludlow & Warner

Attys

UNITED STATES PATENT OFFICE.

SAMUEL R. HUGHES, OF ST. JOSEPH, MICHIGAN.

IMPROVEMENT IN CAR-AXLE BOXES.

Specification forming part of Letters Patent No. **152,377**, dated June 23, 1874; application filed August 26, 1873.

To all whom it may concern:

Be it known that I, SAMUEL R. HUGHES, of St. Joseph, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Journal-Boxes for Railway-Cars; of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming a part hereof, and in which—

Figure 1 represents a side elevation of a part of a railway-car truck, the inner end of the journal-boxes being shown in order that the manner of applying my improvements may be clearly shown; Fig. 2, a vertical central longitudinal section through a car-wheel, its axle, and a journal-box provided with my improvements; Fig. 3, a side elevation of a journal-box provided with my improvements; Fig. 4, a view in all respects like Fig. 2, except that a modification in the manner of applying my improvements is shown; and Fig. 5 represents a modification in the construction of the diaphragm or washer.

The object of my invention is to prevent the dust and grit from entering the journal-boxes, and to retain the oil therein. This I aim to accomplish in such a manner that the means I employ for that purpose may be readily applied to journal-boxes now in use, and as now constructed, and so that a slight modification in the construction of new boxes will adapt them for the reception of my improvements, and enable me to render the latter much more simple.

For the purpose of accomplishing the objects above set forth, my invention consists of a washer or diaphragm, fitted to, and loosely mounted on, the car-wheel axle, and constructed and arranged to close the inner opening of the journal-box, the washer having free play, during the movement of the axle, either in a removable cap or recess constructed to receive it, and arranged on the inner end of the box, or in a slot in the journal-box, all of which will be hereinafter fully described and set forth.

In the drawing, A represents a journal-box constructed in the usual manner, and B is a car-wheel axle, also constructed in the usual manner, and having a bearing in the journal-box. It is essential that the axle should have some play in the box, and that provision should be made for a greater vertical play than forward and backward movement; and, in making provision for this play, the inner opening or mouth of the box is made oblong in form, as shown at *a*. It is also essential that the axle should have some lateral play, and during this lateral play the central part of the inner face of the wheel is frequently in contact with the inner end of the box. The surfaces thus brought in contact with each other are reduced as much as may be practicable, in order to avoid unnecessary friction; and, for this purpose, the inner end of the box is usually provided with an annular shoulder or rib surrounding the opening *a*, as shown at a^1, and the outer face of this shoulder should be smooth, in order to still further decrease the friction.

It will be observed from the foregoing description that dust and grit may enter the opening *a*, and that the oil employed for lubricating purposes may leak away through the same opening.

Having thus fully explained the nature and object of my invention, I will now describe the means I employ for the purposes above set forth.

C is a thin metallic plate, having an opening therein corresponding to the opaning *a;* and this plate is constructed to form a cap over the inner end of the journal-box, thereby admitting of a smooth surface being formed on the outer side of the said cap for the purpose hereinafter explained.

Instead of making the cap C of metal, it may be made of wood, cut away to clamp either the top and bottom of the box, or the sides thereof, or both. D is a metallic cap, in all respects like the metallic cap C, except as hereinafter described. E is a diaphragm or washer, fitted to the axle, and mounted freely thereon. This washer may be made either of metal or of hard fine-grained wood, and either in one or in two parts; and is of such a size and form that, when arranged on the axle in the manner shown, it will cover the opening *a* during all the movements of the axle. When made in two parts, each part is provided with extensions *d d*, lying in rabbets in the other part; and these extensions each extend into

loops or bands *d' d'*, attached to the outer end of each part, as shown in Fig. 5. Each part may then be attached to the other by means of pins or rivets, as shown at *s*. When made in two parts in this manner the diaphragm may be readily removed and replaced without disturbing any of the other parts.

In order to apply my improvements to boxes now in use and as now constructed, the cap C is arranged on the inner end of the box to give a smooth surface thereto. The cap D is arranged on the box in such a position as to set over the cap C. The washer E is arranged between the caps C and D, and sufficient room is left between the said caps to allow the washer to be readily acted upon by the axle; but this space is not so great as to prevent the washer from also operating as a packing as well as a diaphragm. As the vertical movement of the axle is the greatest, the cap D may be slotted or left open at the top and bottom, if necessary, to admit of the free vertical movement of the washer. I deem it preferable, however, in order that the oil may not drip or leak away, to close the bottom of the space in which the washer is arranged. F is a packing of either rubber, leather, or similar packing material, which, for additional security against leakage of oil, may be arranged on the axle, and between the washer E and cap C, and this packing is in form like the washer.

The caps C and D may be attached to the box either by means of screws, or by any suitable means. A convenient and efficient way of attaching them to the box is represented in Fig. 3, wherein *e* represents a band, arranged around the outer cap, and tightly clamped, both caps and the box being cut at the corners to receive the band, as shown at *e'*.

The aggregate thickness of all the parts attached to the inner end of the box should be such that the axle may have considerable lateral play.

When the inner cap is made of wood, and in the manner described, it will be retained in position by means of the outer cap and diaphragm.

In order to construct the box to receive the diaphragm or washer, I slot the inner end of the former, either through the sides, above the bottom, or through from the top to the bottom, leaving the sides closed. The washer may then be placed in the slots thus cut or cast, as shown in Fig. 4, the slots being of such dimensions as to allow the washer to play in the manner described.

It will be perceived from the foregoing description that dust and grit will be prevented from entering the opening *a*, and that the oil cannot leak therefrom when the box is provided with my improved device in the manner described, and that the latter may be readily applied either to boxes now in use, and as now constructed, and that a simple change in the construction of the boxes will admit of the essential feature of my invention being applied without employing all the parts herein shown and described. It will also be perceived that the moving parts of my device may be constructed of such material that the friction will be either of metal against metal, wood against wood, wood against metal, and rubber or other similar packing against either wood or metal. I deem useful the employment of wood in the manner described, for the reason that the wood will, in time, absorb a quantity of oil, and thus make an effectual packing, and create little friction.

By making the outer cap of metal a smooth surface may be presented to the inner face of the wheel when it and the cap are in contact.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The removable diaphragm E, made in two parts, each provided with the arms *d d*, and with rabbets to receive said arms, the parts being combined with retaining-bands *d' d'* and the retaining-pins *s s*, the diaphragm being fitted to, and freely mounted on, the journal, to play in an open recess in the journal-box, substantially as and for the purposes specified.

2. The combination of the removable cap C, the removable cap D, and the removable diaphragm or washer E, with relation to the axle and journal-box, substantially as and for the purposes specified.

SAMUEL R. HUGHES.

Witnesses:

PERSONS P. ALLEN,

ALBERT H. POTTER.