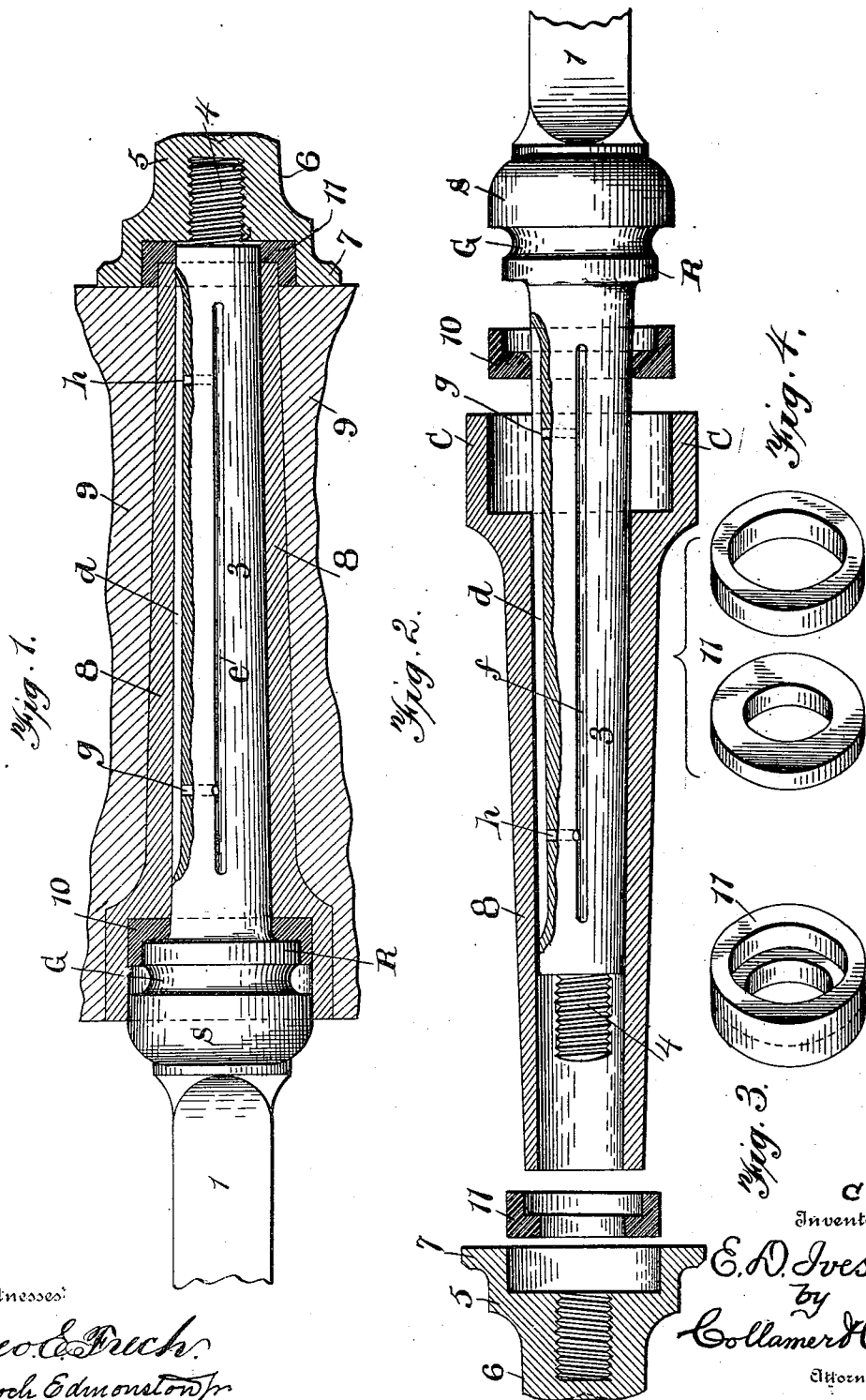


E. D. IVES.

AXLE BOX.

(Application filed June 15, 1900.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

ELLSWORTH D. IVES, OF NORFOLK, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO MERIT N. WOODRUFF, OF SOUTHLINGTON, CONNECTICUT.

AXLE-BOX.

SPECIFICATION forming part of Letters Patent No. 667,779, dated February 12, 1901.

Application filed June 15, 1900, serial No. 20,482. (No model.)

To all whom it may concern:

Be it known that I, ELLSWORTH D. IVES, a citizen of the United States, and a resident of Norfolk, Litchfield county, State of Connecticut, have invented certain new and useful Improvements in Axle-Boxes; (Case C); and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to vehicles, and more especially to the axles thereof; and the object of the same is to produce a lubricating axle-arm having means for retaining the oil, excluding dust and foreign matter from the bearing portion of the device, and preventing the rattling of parts.

To these ends the invention consists in the reversal at the inner end of the axle-box of the construction shown and described in a companion application filed this day by me and bearing Serial No. 20,481, whereby in the present instance a collar on the box surrounds a shoulder on the axle instead of having the collar on the axle surround the inner end of the box.

The present invention also contemplates the use of washers of L-shaped cross-section at both ends of the box or at its inner end in conjunction with any suitable washer at its outer end, and in some instances I may make such L-shaped washer in two members.

The invention is more fully set forth in the following specification and in the accompanying drawings, wherein—

Figure 1 is a central longitudinal section of this device complete with its parts assembled. Fig. 2 is a similar section with the parts slightly removed from their relative positions looking toward the other side of the axle-arm. Fig. 3 is a perspective detail of the washer made in one piece. Fig. 4 is a similar detail of the washer made in two pieces.

Referring to the drawings, 1 designates the axle-bed, having an enlarged shoulder S, with a reduced portion R at its inner end and an annular groove G between its larger and smaller portions.

3 is the axle-arm, having grooves *d e f* and ducts *g h* and reduced and threaded at its

outer end, as at 4; 5, the nut, made angular, as at 6, for the reception of a wrench and having at its inner end a flange 7, with a cup-shaped recess facing inward; 8, the axle-box surrounding the axle-arm and extending at its outer end into the recess of the nut; 9, the hub surrounding this box and secured thereon in any suitable manner, and C a collar at the inner end of the box provided with a recess facing inwardly toward the axle-bed and of sufficient size and depth to completely surround the reduced portion R and the groove of the shoulder and to extend a short distance over and fit closely around its enlarged portion S.

Coming now more particularly to the present invention, 10 designates a washer of L-shaped cross-section, which is seated within the recess in the collar C, so that its vertical portion shall rest against the outer extremity of the shoulder on the axle and its horizontal portion shall closely surround the outer radial face of the reduced portion R of such shoulder without closing the groove G, which latter is for the reception of oil or foreign matter.

11 designates a washer of L-shaped cross-section, seated within the recess in the nut, with its vertical portion lying against the base of said recess and having an opening of sufficient size to pass not only over the threaded portion 4, but also over the outer end of the axle-arm 3 when the nut is screwed in place. The horizontal portion of this washer passes inward for about a quarter of an inch over and around the outer end of the axle-box 8, with its edge preferably standing flush with the inner face of the flange 7 of the nut and also preferably resting close against or in proximity to the outer end of the hub. Both said washers are made removable, so that they can be replaced when damaged or worn, and they are of any suitable material, while their size and the proportion of their parts depend upon the construction of the members of the bearing with which they are employed. Merit is claimed for the use of these washers in connection with an axle-arm having grooves or other means for receiving, containing, and distributing a lubricant. The reason is because I have found by experience that axle-arms so provided with lubricant-

receptacles are liable to leak at both ends of the hub and are also likely to admit dirt and other foreign matter as well as to rattle. By using the washers above described I not only prevent leakage and rattling and avoid the entrance of foreign matter, but I also give the axle-box its greatest possible length or bearing upon the axle-arm.

I find that it is no detriment to have the hub a trifle shorter than the box. In fact, the horizontal portion or flange of the washer in the nut, which surrounds the outer end of the box and rests against the outer extremity of the hub, forms an additional means by its contact therewith for preventing the egress of oil and the ingress of dirt, while the groove G in the shoulder on the axle will soon fill with dirt and grease, which assists the washer in preventing the egress of oil and the ingress of dirt at the inner end of this bearing. It will be clear that with this construction there will be no necessity for the employment of the dust-cap or double nut so commonly used to close the outer end of the bearing.

In Fig. 3 I have shown in detail one of said L-shaped washers made of a single piece of material, and in Fig. 4 I have shown how the vertical and horizontal portions of this washer could be made in two pieces of material, yet it will be clear that when these two pieces are assembled within the recess which contains the whole the washer will be L-shaped to all intents and purposes. Therefore where I speak herein of an "L-shaped" washer I desire to be understood as covering this washer either in one piece or in a plurality of pieces.

What is claimed as new is—

1. The combination with an axle having its outer end threaded, a shoulder thereon between the bed and arm and comprising an enlarged body and a reduced outer end with an annular groove between, and a nut having a washer; of an axle-box surrounding the arm and contacting at its outer end with said washer, its inner end having a collar with an inwardly-facing longitudinal recess fitting around the enlarged portion of the shoulder, and a washer of L-shaped cross-section closely surrounding the axle-arm and located within said recess in the box with its vertical portion against the longitudinally outer end of the shoulder and its horizontal portion fitting around the reduced portion of the shoulder, substantially as described.

2. The combination with an axle having its outer end threaded, a shoulder thereon between the bed and arm and comprising an enlarged body and a reduced outer end with an annular groove between, and a nut having a washer; of an axle-box surrounding the arm and contacting at its outer end with said washer, its inner end having a collar with an inwardly-facing recess surrounding the enlarged portion of the shoulder, and a washer of L-shaped cross-section located within said recess with its vertical portion against the

end of the shoulder and its horizontal portion surrounding the reduced portion of the shoulder but not covering the groove, substantially as described.

3. The combination with an axle having its outer end threaded, a shoulder thereon between the bed and arm and comprising an enlarged body and a reduced outer end, a nut having a recess in its inner face, and a washer therein of L-shaped cross-section; of the axle-box surrounding the arm and extending at its outer end into said washer, its inner end having a collar with an inwardly-facing recess surrounding the enlarged portion of the shoulder, and a washer of L-shaped cross-section located within said recess with its vertical portion against the end of the shoulder and its horizontal portion surrounding the reduced portion of the shoulder, substantially as described.

4. The combination with an axle having an enlarged shoulder between its bed and arm, said arm having ducts and grooves for the reception of the lubricant, and a nut at the outer extremity of the arm, said nut having a radial flange at its inner end provided with a recess facing longitudinally inward; of an axle-box surrounding the arm, the hub thereon standing normally against said flange, a collar at the inner end of the box having a recess surrounding said shoulder, and washers of L-shaped cross-section fitting in both said recesses with the horizontal portion of each projecting toward the axle-bed, substantially as described.

5. The combination with an axle, a nut at the outer end of its arm, a box journaled on the arm, and a shoulder and recessed collar on the axle and box; of a washer within the recess and of L-shaped cross-section, the washer being in a plurality of pieces one of which stands between the bottom of the recess and the end of the shoulder while the other stands within the recess and surrounds the shoulder, substantially as described.

6. The combination with an axle having its outer end threaded, a shoulder thereon between the bed and arm, a nut having a recess in its inner face, and a washer therein of L-shaped cross-section; of the axle-box surrounding the arm and extending at its outer end into said washer, its inner end having a collar with an inwardly-facing recess surrounding the shoulder, and a washer of L-shaped cross-section located within said recess with its vertical portion against the end of the shoulder and its horizontal portion surrounding the shoulder, substantially as described.

In testimony whereof I have hereunto subscribed my signature this the 14th day of June, A. D. 1900.

ELLSWORTH D. IVES.

Witnesses:

N. L. COLLAMER,
GERTRUDE C. LYDDANE.