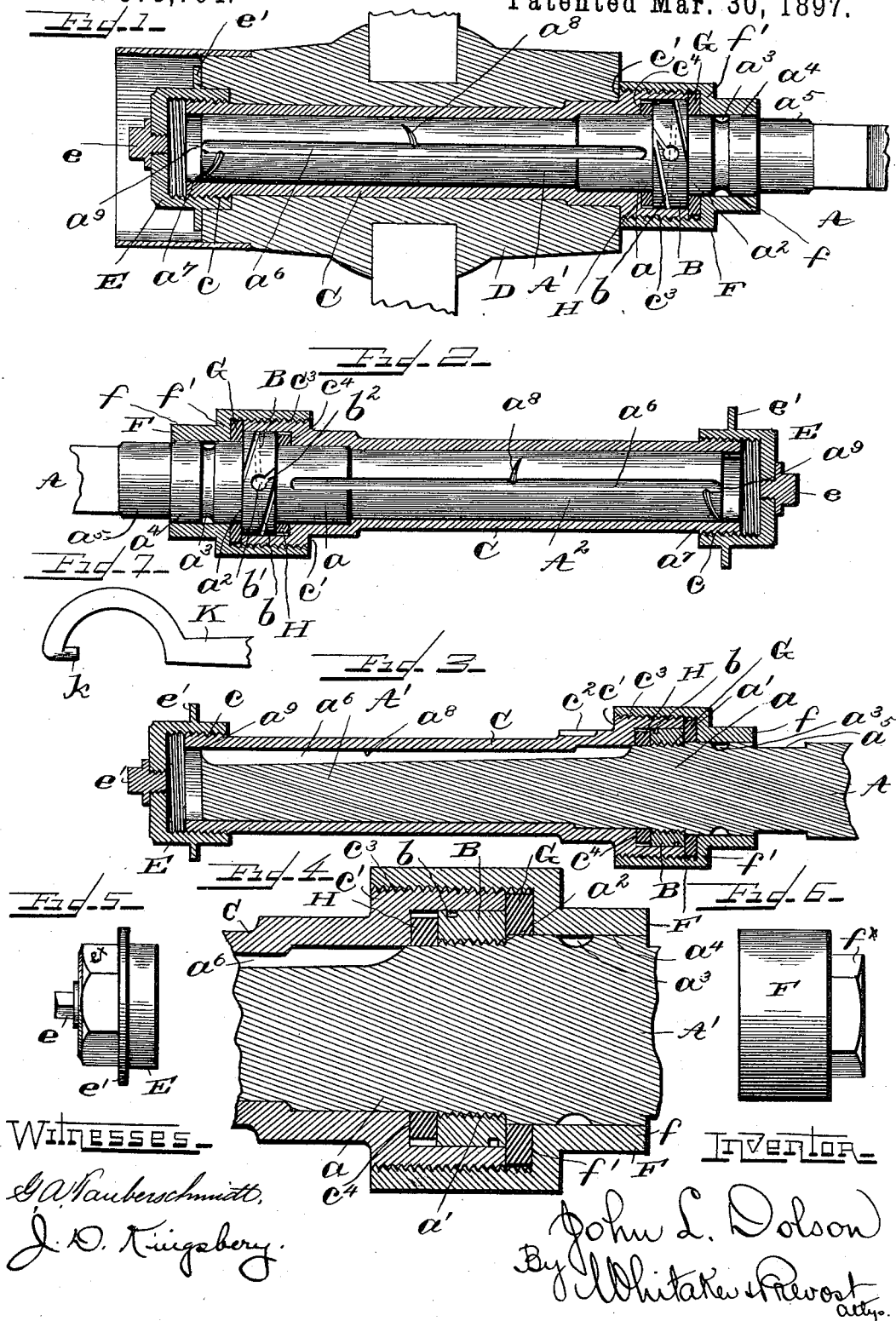


(No Model.)

J. L. DOLSON.  
LUBRICATING AXLE.

No. 579,704.

Patented Mar. 30, 1897.



# UNITED STATES PATENT OFFICE.

JOHN L. DOLSON, OF CHARLOTTE, MICHIGAN.

## LUBRICATING-AXLE.

SPECIFICATION forming part of Letters Patent No. 579,704, dated March 30, 1897.

Application filed November 10, 1896. Serial No. 611,648. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN L. DOLSON, a citizen of the United States, residing at Charlotte, in the county of Eaton and State of Michigan, have invented certain new and useful Improvements in Lubricating-Axles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improvement in lubricating-axles; and it consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

Referring to the said drawings, Figure 1 represents a horizontal sectional view of a hub and box for the left-hand spindle of an axle, the axle being shown in elevation. Fig. 2 is a similar view of the box and right-hand spindle of axle. Fig. 3 is a vertical longitudinal sectional view of the left-hand spindle of axle and its box. Fig. 4 is an enlarged view of the construction shown at the right in Fig. 3. Figs. 5 and 6 are exterior views of the cap and collar which engage the box. Fig. 7 is a view on a reduced scale of a wrench for screwing up the spindle-collar.

In the drawings, A represents the axle proper, and A' A<sup>2</sup> the spindles which receive the boxes, A' representing the left spindle and A<sup>2</sup> the right. The spindle A' (see Figs. 1, 3, 4, 5, and 6) is provided with the usual shouldered portion *a* at its inner end, provided for a portion of its extent with screw-threads *a'*, at the inner end of which is a shoulder *a*<sup>2</sup>.

B represents a screw-threaded collar which is screwed over the threaded portion *a'* in the same direction as the forward rotation of the wheel until it abuts tightly against the shoulder *a*<sup>2</sup>. (See Fig. 4.) On the inner side of the shoulder *a*<sup>2</sup> is a sand-groove *a*<sup>3</sup>, which is preferably in the center of a smooth turned portion *a*<sup>4</sup> of the spindle. On the inner side of this turned portion *a*<sup>4</sup> is another turned portion *a*<sup>5</sup> to allow the inner screw-collar to be slipped back from over the collar B, as will appear hereinafter.

In the top of the spindle and extending longitudinally thereof is the usual oil-groove *a*<sup>6</sup>, which is deeper adjacent to the point of the spindle than it is adjacent to the shouldered part *a*, said groove extending from the point of the spindle to a point near the collar B.

*a*<sup>7</sup> represents a spiral groove which I term the "feed-groove" and which is cut in the spindle from a point on the under side at the end or point of the spindle extending around the rear side of the spindle to a point on the upper side slightly back from the point of the spindle, where it empties into the main oil-groove *a*<sup>6</sup>.

*a*<sup>8</sup> represents a groove which I term the "distributing-groove," which is cut in the front side of the spindle from the main oil-groove *a*<sup>6</sup> nearly half-way around the spindle, where it vanishes, this groove being for the purpose of distributing the oil in the groove *a*<sup>6</sup> to the exterior of the spindle.

*a*<sup>9</sup> represents an overflow-space at the outer end of the oil-groove *a*<sup>6</sup> of the spindle.

C represents the box, which is of tubular form, made to fit the spindle in the usual manner, and adapted to engage the aperture in the hub D. The outer end of the box is provided with a threaded portion *c*, which is engaged by a screw-cap E, which is so formed as to constitute a reservoir for oil and is provided with a central screw-plug *e*, which can be removed to fill the cap with oil without removing the cap E. The said cap is also provided with a laterally-extending flange *e'* to engage the outer end of the hub when the cap is screwed onto the box and thus securely hold the box in the hub, as shown in Fig. 1. The inner end of the box C is provided with a shoulder *c'*, against which the inner end of the hub abuts, and is clamped by the flange *e'* on the screw-cap E. The exterior of the box is also provided with longitudinally extending ribs *c*<sup>2</sup> to prevent the hub from turning on the box, and beyond the shoulder *c'* is a screw-threaded portion *c*<sup>3</sup>, which is engaged by a screw-threaded retaining-collar F, which retains the box upon the spindle. This retaining-collar is provided with a bored portion *f*, which fits easily over the turned portion *a*<sup>4</sup> of the spindle and covers the sand-groove *a*<sup>3</sup>, and said collar has a shoulder *f'*, which is parallel to the inner face of the col-

lar B. A washer G, of leather or rubber, is placed on the spindle between the collar B and the shoulder  $f'$ , so that when the retaining-collar is screwed on the box the said washer prevents any dust from getting between the spindle and box, even if it should pass the sand-groove  $a^3$ .

It is to be understood that the screw-cap E and retaining-collar F will be so threaded as to screw on in the opposite direction to the forward movement of the wheel on each end of the axle.

The collar B is provided with a spiral groove  $b$ , extending around the periphery of the same in the direction of the forward revolution of the box, said groove extending from a point on the upper side of the collar at its inner side entirely around the same to a point opposite its beginning on the outer side of the collar, so that if any oil collects upon the periphery of the collar it will enter the groove  $b$ , and by the revolution of the box will be carried around and conducted to the outer side of the collar adjacent to the main oil-groove of the spindle. A washer H is interposed between the collar B and a shoulder  $c^4$  of the box, which is parallel to said collar, and said washer is made of less diameter than the box, as shown, so that the oil may pass from the periphery of the collar B outward to the spindle.

It will be seen that the collar B is clamped between the shoulder  $c^4$  of the box and the shoulder  $f'$  of the retaining-collar, with the washers G and H interposed between the parts, as described, so that there will be little or no lateral play of the box upon the spindle.

In order that the collar may be screwed upon the spindle, I provide it with an aperture  $b'$  to receive the point  $k$  of a wrench K, which is conveniently used for this purpose, the said wrench being shown on a reduced scale in Fig. 7. In order to prevent oil from collecting in the said aperture  $b'$ , I provide an overflow-groove  $b^2$  from said aperture to the outer face of the collar to conduct the oil back to the spindle, said groove  $b^2$  extending forwardly in an inclined direction.

As shown in Fig. 2, the right-hand spindle and box are constructed exactly the same as the left, except that the direction of the grooves and the screw-threads of the threaded parts are reversed, so as to bear the proper relation to the forward movement of the wheel and box, as will be readily understood.

In assembling the parts of the device the retaining-collar F is first placed over the spindle and pushed back as far as possible over the turned portion  $a^5$ , and the washer G is placed within said collar. The collar B is then placed on the spindle and screwed up against the shoulder  $a^2$  by means of the wrench K, and the washer H is placed against its outer face. The box is of course driven into the hub and provided with the cap E, after which the box is slipped over the spindle and the retaining-collar F is then screwed onto the

box until the parts are held in position, but permitting the box to turn easily on the spindle. Exterior portions of the cap E and collar F are provided with polygonal portions, as shown at  $e^x$  and  $f^x$ , Figs. 5 and 6, to permit of their being turned up with a wrench. The screw-plug  $e$  is then removed and the cap E is filled with oil, which is fed to the oil-groove  $a^6$  by the forward revolutions of the wheel by the spiral groove  $a^7$ , and the oil is distributed to the spindle and box by the groove  $a^8$ .

It will be seen from the drawings that the main portion of the oil-holding recess of the cap or plug  $e$  is below the plane of the main oil-groove  $a^6$ , and the revolutions of the box cause the oil to travel up the inclined groove  $a^7$  into the main groove  $a^6$ .

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

1. The combination with the box, of the spindle provided with a longitudinal main oil-groove on its upper side and a spiral feed-groove extending from a point in the main groove back from the end of the spindle, to the end face of the spindle at a point below the main oil-groove, and a recessed oil-holding cap engaging the box and having the main portions of its oil-recess below the plane of the main oil-groove, whereby the oil is carried from said oil-recess upward through the spiral groove to the main oil-groove by the revolution of the box, substantially as described.

2. The combination with the box, of the spindle provided with a longitudinal main oil-groove on its upper side, a spiral feed-groove extending from a point in the main groove back from the end of the spindle to a point on the end of the spindle below said main groove and an overflow from the oil-groove at the extreme end of the spindle, and a recessed oil-holding cap engaging said box and having the main portions of its oil-recess below the plane of the main oil-groove whereby the oil will be carried from the oil-recess upward through the feed-groove to the main oil-groove by the rotation of the box, substantially as described.

3. The combination with the box provided adjacent to its inner end with a shoulder, of the spindle provided with a longitudinal main groove and a spiral feed-groove adjacent to the point of the spindle, a detachable collar secured to said spindle and provided on its periphery with a spiral groove extending from a point near the inner face of the collar forwardly around the collar to the outer face to conduct lubricant outwardly toward the main oil-groove, a retaining-collar on the spindle engaging the box and having a shoulder on the inner side of the said spindle-collar, and an oil-holding cap engaging the outer end of the box and communicating with the spiral feed-groove, substantially as described.

4. The combination with the spindle provided with an annular sand-groove, a longitudinal main oil-groove and a spiral feed-

groove adjacent to the spindle-point, communicating with the main groove, of a collar detachably engaging the spindle between the main oil-groove and the sand-groove and provided with a spiral groove extending around its periphery from the inner face to the outer face, the box engaging the spindle and provided with a shoulder adjacent to the outer face of the said spindle-collar, a retaining-collar having a portion engaging the spindle and covering said sand-groove, a shoulder adjacent to the inner face of the spindle-collar and a portion for engaging the box, a washer of less diameter than the box interposed between the shoulder of the box and the spindle-collar, and an oil-holding cap secured to the outer end of the box and communicating with said feed-groove, substantially as described.

5. The combination with the spindle provided with an annular sand-groove, a longitudinal main oil-groove, and a spiral feed-groove adjacent to the spindle-point communicating with the main oil-groove, and a shoulder adjacent to the sand-groove, of a

collar detachably secured to the spindle and engaging said shoulder and provided with a spiral groove extending around its periphery from its inner face to its outer face, the box surrounding the spindle and provided with a shoulder adjacent to said collar, the retaining-collar having a portion surrounding the spindle and covering said sand-groove, a shoulder adjacent to said spindle-collar and a portion detachably engaging the box, a washer interposed between the retaining-collar and the spindle-collar, fitting tightly in said retaining-collar, a washer of less diameter than the box interposed between the shoulder of the box and the spindle-collar, and an oil-holding cap detachably secured to the box communicating with said spiral feed-groove and provided with a removable plug, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN L. DOLSON.

Witnesses:

J. M. C. SMITH,  
ADA O'NEIL.