No. 710,944. Patented Oct. 14, 1902.

J. Y. BROWN.

SELF LUBRICATING AXLE SPINDLE.

(Application filed Nov. 21, 1901.)

(No Model.)

Fig. 1.

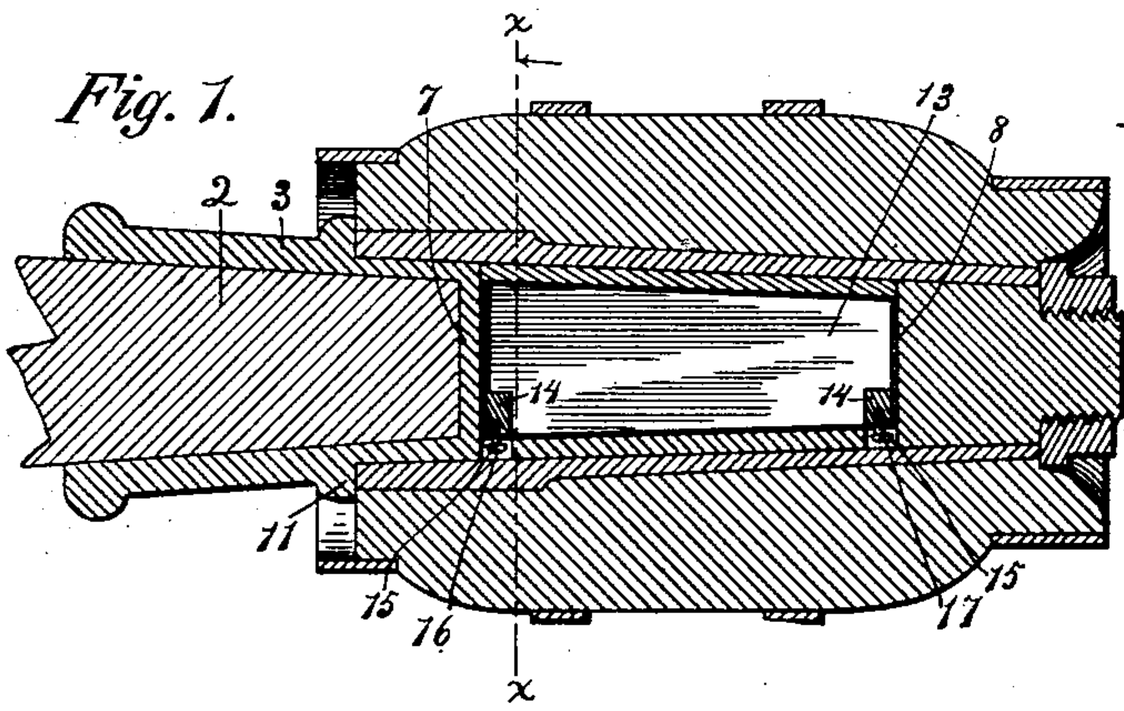


Fig. 2.

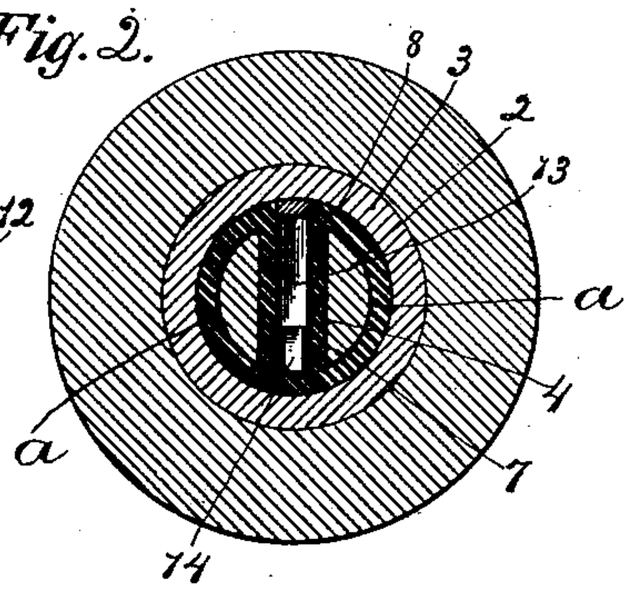


Fig. 3.

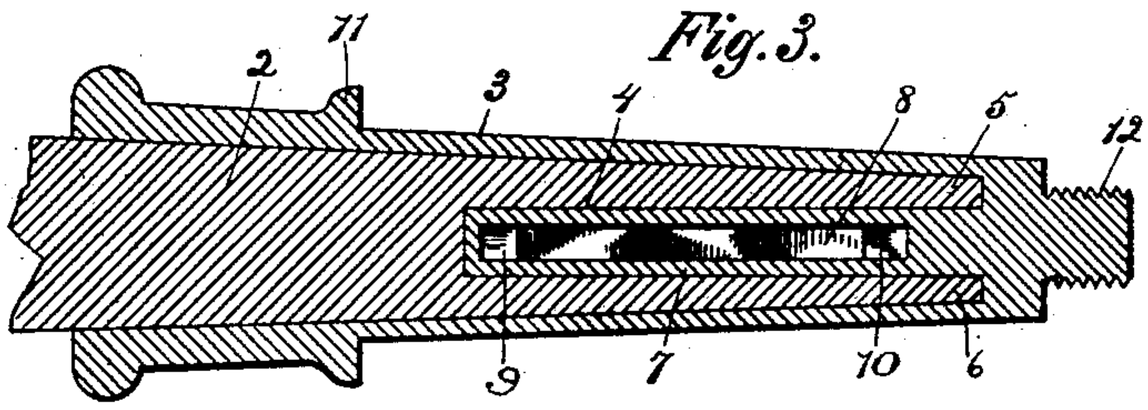


Fig. 4.

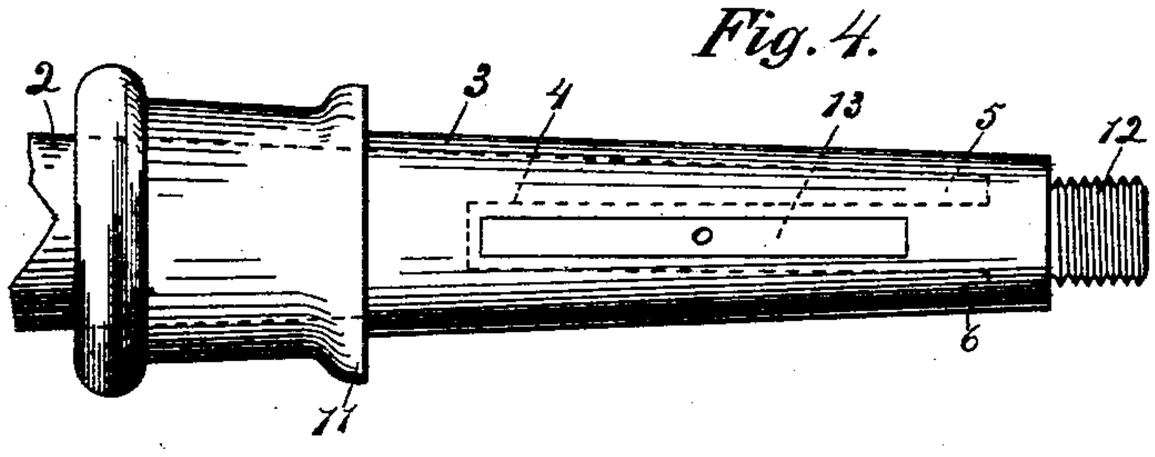


Fig. 5.

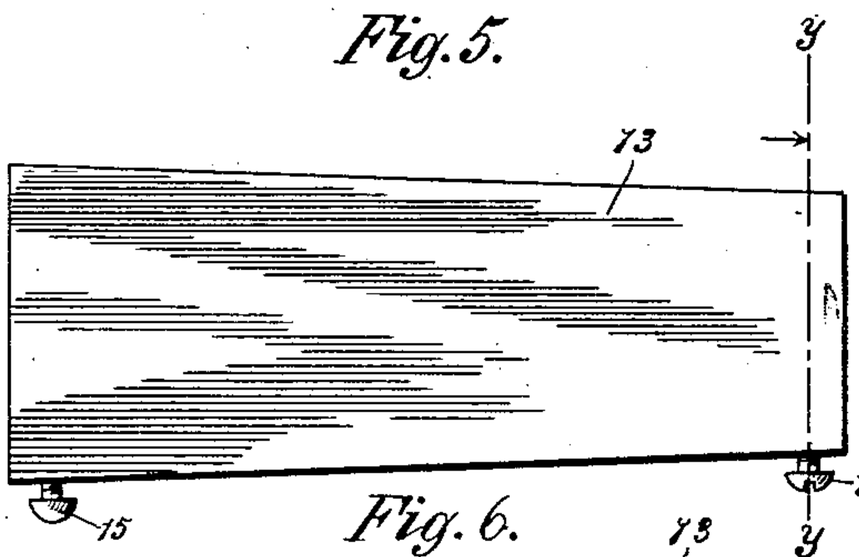


Fig. 6.

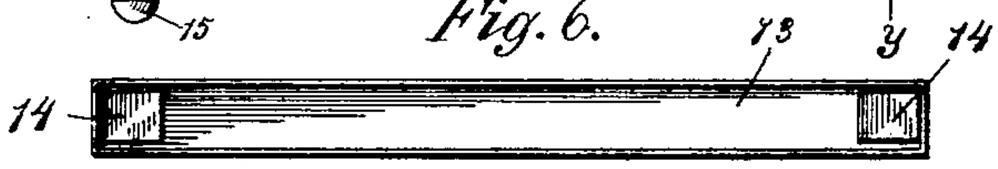
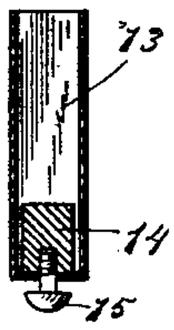


Fig. 7.



WITNESSES:

W. H. Colton

E. D. Pell

INVENTOR.

BY James Y. Brown.

Fred A. Bowerman ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES Y. BROWN, OF LEAVENWORTH, KANSAS.

SELF-LUBRICATING AXLE-SPINDLE.

SPECIFICATION forming part of Letters Patent No. 710,944, dated October 14, 1902.

Application filed November 21, 1901. Serial No. 83,148. (No model.)

To all whom it may concern:

Be it known that I, JAMES Y. BROWN, a citizen of the United States, residing at Leavenworth, in the county of Leavenworth and State of Kansas, have invented certain new and useful Improvements in Self-Lubricating Axle-Spindles, of which the following is a specification.

This invention relates to self-feeding devices for the lubrication of axles, and particularly to self-lubricating axle-spindles for vehicles.

The object of my invention is the construction of a device which may with comparatively little difficulty and expense be applied to ordinary vehicle-axle spindles to obviate the necessity for frequent removals of the wheels and the consequent delay in oiling in the usual manner.

In a general way my invention consists in a suitable chamber within the axle-spindle to be used either with or without a removable reservoir or cup and means for automatically controlling the emission or supply of oil from said chamber or reservoir to the bearing-surfaces.

My invention further consists in means for equipping axles of ordinary construction with my improved self-feeding device, and my invention further consists in the various details of construction and in combinations of parts, all as hereinafter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal vertical central section of an axle-spindle embodying my complete invention. Fig. 2 is a vertical section of the same substantially on the line $x\,x$ of Fig. 1. Fig. 3 is a horizontal central section of the same, the oil-reservoir having been removed. Fig. 4 is a top plan view of the same, interior parts being shown by dotted lines. Fig. 5 is an enlarged side elevation of the removable reservoir or cup. Fig. 6 is a top plan of the same. Fig. 7 is a vertical section of the same substantially on the line $y\,y$ of Fig. 5.

Referring now to the drawings in detail, the numeral 2 refers to the spindle of a vehicle-axle, which may have been turned down to a smaller average diameter to permit of the employment therewith of a thimble or sleeve-spindle 3 of usual or standard size or gage, snugly incasing the same. In applying my device to ordinary vehicle-axles the original spindle must be solid; not tubular. The butting ring or collar and the threaded plug at the end thereof having been removed the vertical rectangular slot 4 is cut to fork said spindle 2, leaving the two similar and opposite longitudinal projections 5 and 6. The sleeve-spindle 3 is provided with longitudinal cavities at the extremity thereof of the same size and shape as the projections 5 and 6 and located to receive said projections, which fit snugly therein. Said sleeve-spindle may be fastened in any suitable manner. A central wall 7 of said sleeve-spindle is thus provided between said cavities, within which is provided the vertical rectangular longitudinally-extending slot or chamber 8, open at the top and extending nearly but not quite through said spindle. I have shown this slot or chamber 8 provided with two bottom apertures 9 and 10, one at each end thereof, opening to the bushing of the hub. It may be, however, that one aperture will be sufficient for ordinary uses, in which case this aperture will be located at the end of said slot or chamber nearest the butting-ring, that the swing and gather of the axle will tend to distribute the lubricating fluid over the whole surface of the axle-box. The sleeve-spindle is further provided with the usual butting ring or collar 11 and the threaded projection 12 for the axle-nut.

The reservoir or oil-cup 13 is preferably made of tin or light sheet metal and is shaped to fit the chamber 8 of the sleeve-spindle. Said reservoir is thus adapted to be removably inserted within said chamber and may or may not be provided with a suitable lid or cover, none being shown. This reservoir is further provided with one or more bottom apertures, (two being shown,) each contiguous to the corresponding aperture of the chamber 8. Immediately above each aperture in said reservoir is a small cap or lid 14, preferably of metal and of sufficient height to be retained in somewhat unstable equilibrium. This cap 14 is preferably rectangu-

lar in configuration, so that the engagement of its sides with the side walls of the reservoir 13 will prevent rotation of said cap. A screw 15, threaded into said cap, extends through the aperture in said reservoir and terminates in a head larger than said aperture. The bottom wall of the chamber 8 in the sleeve-spindle 3 is thick enough to provide small chambers 16 and 17, wherein are contained the screw-heads to prevent the latter from coming in contact with the bushing of the hub. The cap 14 is designed to keep the aperture normally closed by its own weight when the vehicle is not in motion, but being in somewhat unstable equilibrium, the diameter of the aperture being slightly in excess of the diameter of the screw and a slight freedom of vertical movement being permitted by the proper adjustment of the screw, it is evident that the jar of the spindle when the vehicle is in motion will slightly displace said cap and permit the emission under force of gravity of a small but comparatively steady flow of the lubricating fluid to the axle-box, the amount of fluid delivered being easily regulated in advance by the adjustment of the screw and cap. When the vehicle is stopped, the weight of the cap or lid will again close the aperture and cut off the supply of fluid.

It is evident that the slot or chamber 8 may, if desired, be cut in the ordinary spindle, and one object in providing a sleeve-spindle is to give the axle additional strength. Another object is to provide a device which may be readily applied to an ordinary axle, it being much easier to fork the end of the axle than to cut the rectangular chamber therein, and while the use of a removable reservoir or cup for the oil has many advantages it is nevertheless not an essential element of my invention, as it is obvious that the oil may be poured directly into the chamber 8 and the same means utilized for controlling the supply to the bearing.

Many modifications of the minor details of my improved self-lubricating axle-spindles will doubtless readily suggest themselves to those skilled in the art to which it appertains, and I therefore do not desire to limit my invention to the specific construction herein shown and described.

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

1. In a self-lubricating axle-spindle, the combination with an inner forked spindle of a sleeve-spindle having longitudinal cavities to receive and incase the members of said forked spindle and having a chamber within the wall between said cavities, there being at least one lower aperture to said chamber, and means for automatically controlling the flow of lubricating fluid through said aperture.

2. In a self-lubricating axle-spindle, the combination with a spindle of a non-revolving sleeve-spindle incasing the same, said sleeve-spindle having a chamber therein provided with at least one lower aperture, a removable reservoir within said chamber having at least one corresponding aperture, and means for automatically controlling the flow of lubricating fluid through said aperture to the bearing-surfaces.

3. In a self-lubricating axle-spindle, the combination with an inner forked spindle of a sleeve-spindle having longitudinal cavities to receive and incase the members of said forked spindle and having a chamber within the wall between said cavities, there being at least one lower aperture to said chamber, a removable reservoir within said chamber having at least one corresponding aperture, and means for automatically controlling the flow of lubricating fluid through said aperture to the bearing-surfaces.

4. In a self-lubricating axle-spindle, the combination with a spindle of a non-revolving sleeve-spindle incasing the same, said sleeve-spindle having a chamber therein provided with at least one lower aperture, a cap over said aperture, and means for retaining said cap in somewhat unstable equilibrium.

5. In a self-lubricating axle-spindle, the combination with an inner forked spindle of a sleeve-spindle having longitudinal cavities to receive and incase the members of said forked spindle and having a chamber within the wall between said cavities in said sleeve-spindle, there being at least one lower aperture to said chamber, a cap over said aperture, and means for retaining said cap in somewhat unstable equilibrium.

6. In a self-lubricating axle-spindle, the combination of a spindle having a chamber therein extending vertically nearly but not quite through said spindle and provided with at least one lower aperture, a removable reservoir within said chamber having at least one corresponding aperture, a cap over the aperture in said reservoir, and means for retaining said cap in somewhat unstable equilibrium.

7. In a self-lubricating axle-spindle, the combination with a spindle of a non-revolving sleeve-spindle incasing the same, said sleeve-spindle having a chamber therein provided with at least one lower aperture, a removable reservoir within said chamber provided with at least one corresponding aperture, a cap over the aperture in said reservoir, and means for retaining said cap in somewhat unstable equilibrium.

8. In a self-lubricating axle-spindle, the combination of a spindle, a chamber therein having at least one lower aperture, a removable reservoir within said chamber having at least one corresponding aperture, a cap over the aperture to said reservoir of sufficient height to be retained by gravity in somewhat unstable equilibrium, a screw threaded into the bottom of said cap the shank of which is less in diameter than the diameter of said ap-

erture and which terminates in a head of greater diameter than that of said aperture.

9. In a self-lubricating axle-spindle, the combination with a spindle of a sleeve-spindle incasing the same having a chamber in said sleeve-spindle provided with at least one lower aperture, a removable reservoir within said chamber having at least one corresponding aperture, a cap over the aperture in said reservoir, which cap is of sufficient height to be retained by gravity in somewhat unstable equilibrium, a screw threaded into the bottom of said cap the shank of which is less in diameter than the diameter of said aperture and which terminates in a head of greater diameter than that of the aperture in said reservoir.

10. In a self-lubricating axle-spindle, the combination with an inner forked spindle of a sleeve-spindle having longitudinal cavities to receive and incase the members of said forked spindle and having a chamber within the wall between the cavities in said sleeve-spindle, there being at least one lower aperture to said chamber, a removable reservoir within said chamber having at least one corresponding aperture, a cap over the aperture in said reservoir, and means for retaining said cap in somewhat unstable equilibrium.

In testimony of the foregoing I have hereunto set my hand, this 22d day of October, 1901, in the presence of two subscribing witnesses.

JAMES Y. BROWN.

Witnesses:
F. M. McHALE,
JOHN Q. A. NORTON.