No. 785,128 PATENTED MAR. 21, 1905.

E. T. THAYER.

SELF OILING CAR WHEEL.

APPLICATION FILED APR. 30, 1904.

Fig. 1

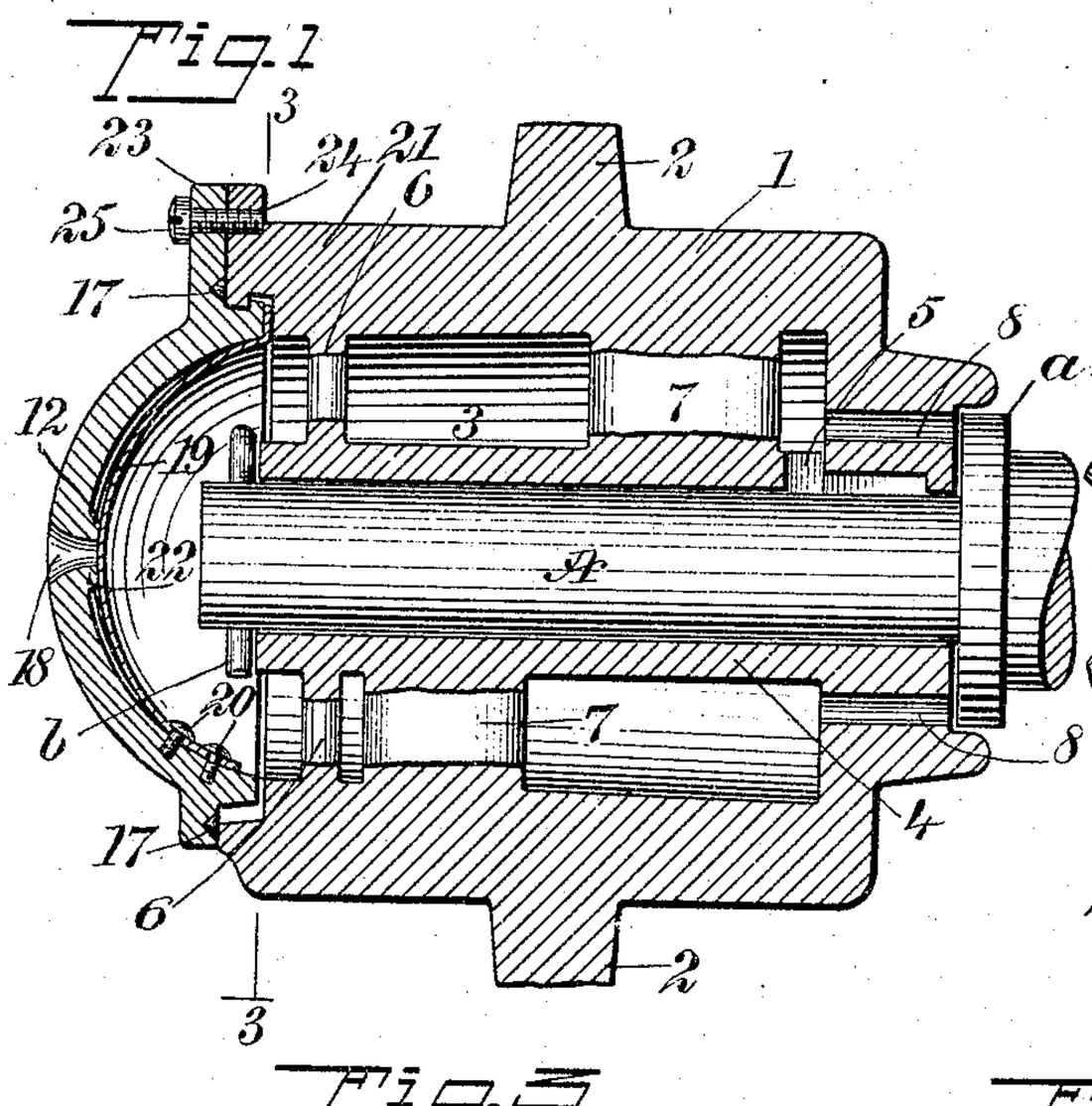


Fig. 2

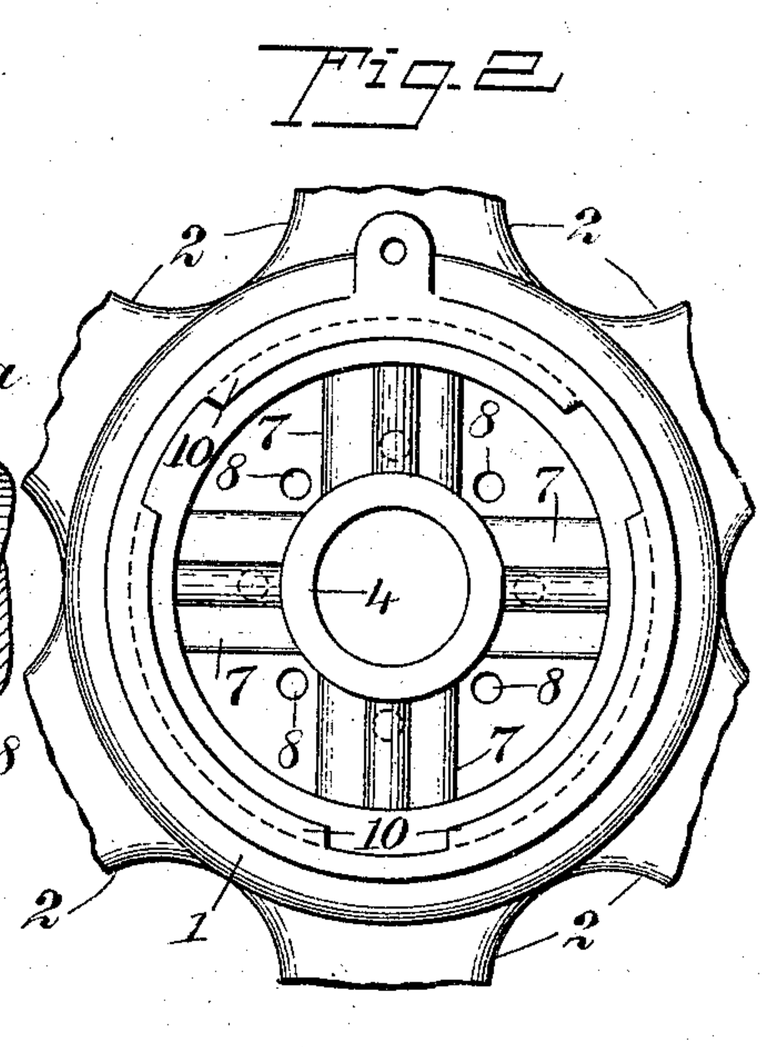


Fig. 3

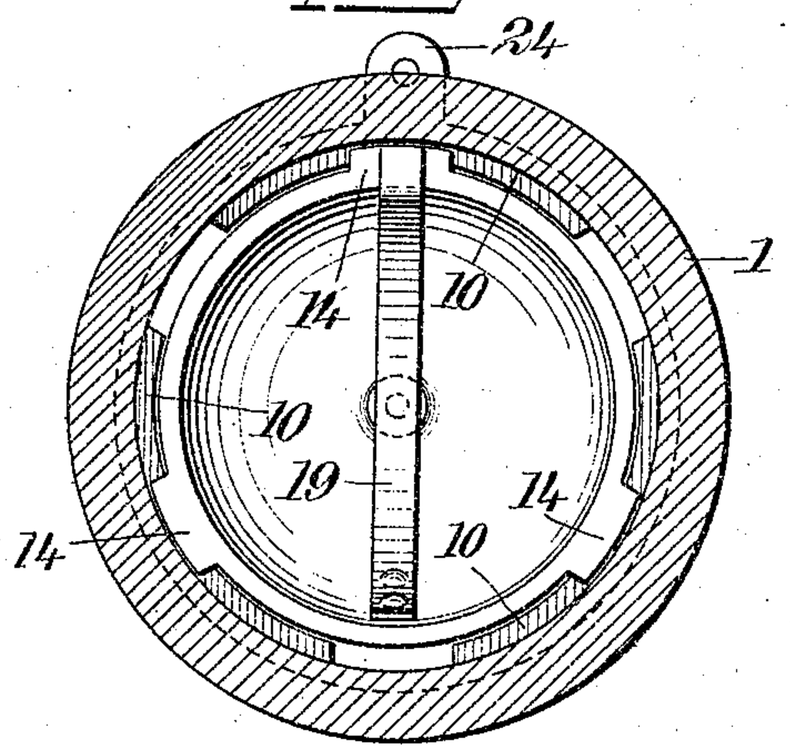


Fig. 4

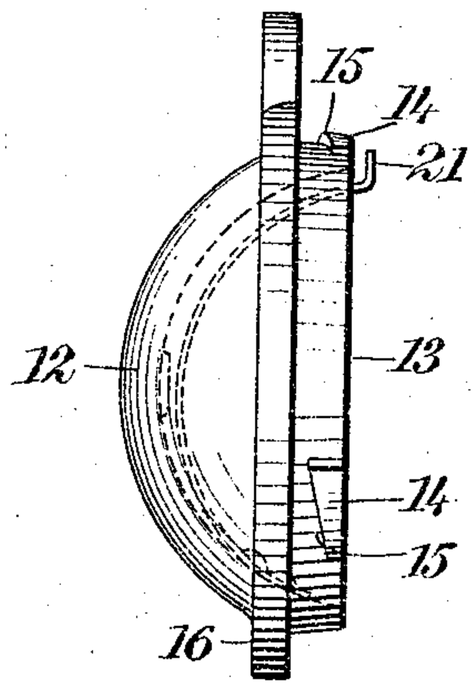


Fig. 5

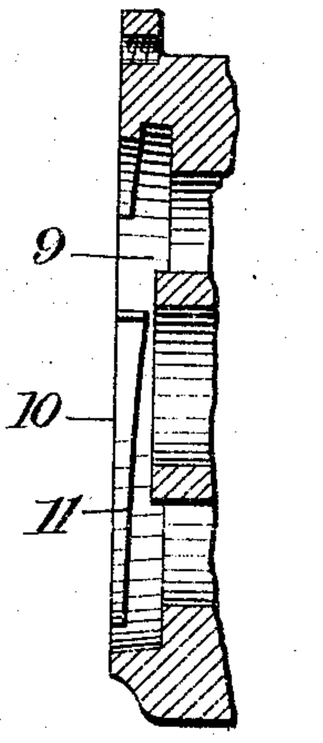


Fig. 8

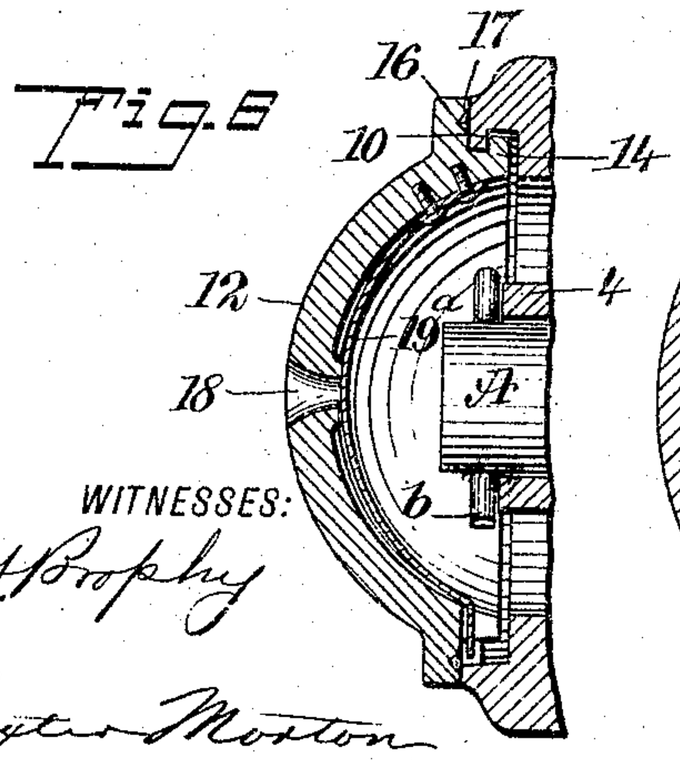
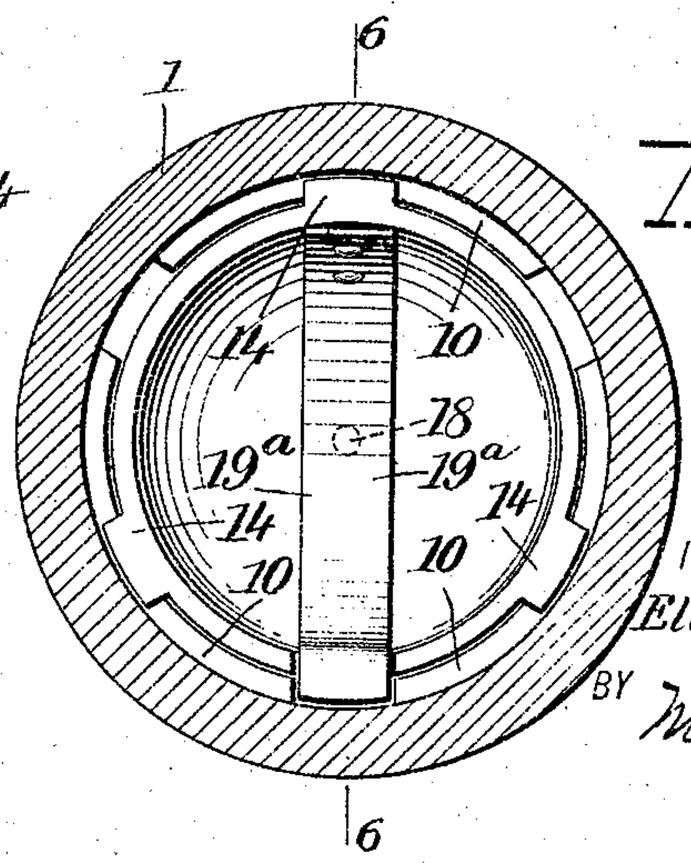


Fig. 7



WITNESSES:

J. A. Brophy

Dexter Morton

INVENTOR

Ellis Taylor Thayer

BY Munn & Co.

ATTORNEYS

No. 785,128. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

ELLIS TAYLOR THAYER, OF CHARLESTON, WEST VIRGINIA, ASSIGNOR OF ONE-THIRD TO JAMES E. CRAWFORD, OF CHARLESTON, WEST VIRGINIA.

SELF-OILING CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 785,128, dated March 21, 1905.

Application filed April 30, 1904. Serial No. 205,712.

To all whom it may concern:

Be it known that I, ELLIS TAYLOR THAYER, a citizen of the United States, and a resident of Charleston, in the county of Kanawha and State of West Virginia, have invented a new and Improved Self-Oiling Car-Wheel, of which the following is a full, clear, and exact description.

The object of this invention is to provide in a car-wheel of the same general type as that for which Letters Patent No. 317,243 were granted to me May 5, 1885, a novel removable closure-cap at the outer end of the wheel-hub to facilitate the cleaning of the oil-chamber within the hub and to provide for the introduction of oil within the chamber with less difficulty than in the car-wheel described in the above-mentioned patent.

With the objects above stated and others in view, as will hereinafter appear, the invention consists in a novel car-wheel constructed as hereinafter described in a preferred form of embodiment and having the novel features thereof particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, and arrangement of the parts may be made within the scope of the appended claims without departing from the spirit of the invention.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal sectional view through the hub of the improved car-wheel. Fig. 2 is an end view of the hub with the improved closure-cap removed. Fig. 3 is a transverse sectional view on the line 3 3 of Fig. 1. Fig. 4 is a side elevation of the closure-cap detached. Fig. 5 is a detail view in section of a portion of the outer end of the hub of the improved car-wheel with the closure-cap removed to show the improved form of retention-lugs provided therein for engagement with lugs upon the closure-cap; and Figs. 6 and 7 are sectional views showing a slightly-different means for securing the closure-cap in position upon the hub, Fig. 6 being taken upon the line 6 6 of Fig. 7.

Referring to the drawings by the reference characters marked thereon, A designates the journal of the axle upon which the car-wheel is rotatably mounted, the axle being provided with a flange or collar *a*, as usual, to form a shoulder against which the hub of the car-wheel is held when in position upon the journal of the axle by means of a key *b*, which extends transversely through the outer end of the journal of the axle.

1 designates the hub of the car-wheel, from which the spokes 2 project radially in the usual manner. The hub is formed with an oil-chamber 3, concentric with the hub and of somewhat greater diameter at the inner end than at the outer end, as shown clearly in Fig. 1. Concentric with the outer shell of the hub is a bearing-sleeve 4, within which the journal A of the axle fits, and one or more oil-passages 5 are formed in the sleeve 4 near its inner end to permit the passage of oil from the oil-chamber 3 to the journal of the axle. At its inner end the bearing-sleeve 4 connects directly with the outer shell 1 of the hub, and at its outer end a plurality of radially-arranged connections 6 are formed between the bearing-sleeve and the shell.

To provide for the agitation of the oil in the oil-chamber 3, a plurality of blades or agitators 7 are provided between the sleeve 4 and the shell 1 of the hub, these blades or agitators being arranged preferably in staggered order and being made, if desired, of slightly different widths, as shown. To provide for the transmission of the oil to the shoulder formed by the flange or collar *a*, a plurality of oil-passages 8 are formed in the inner end of the shell 1 of the hub, which open against the flange or collar *a*.

At its outer end the shell 1 of the hub is formed with a shallow counterbore 9, and in this counterbore there are preferably formed a plurality of inwardly-projecting lugs 10, each presenting a cam-surface 11 for engagement with a lug formed upon the removable closure-cap, which is secured upon the hub. These lugs 10 are spaced slightly apart, as clearly shown in Figs. 3 and 5, and the cap 12, which forms the preferred form of closure for

the outer end of the hub, is provided with an extension 13, which is adapted to enter the counterbore of the hub and which is provided with a plurality of outwardly-projecting lugs 14, each of which presents a cam-surface 15, which is adapted to coöperate with the cam-surface 11 of one of the lugs 10, formed in the counterbore of the shell 1 of the hub. The lugs 14 are of course of such dimensions that they will pass easily through the spaces left between the lugs 10 in the counterbore 9, and the cam-faces 15 of the said lugs are brought into operative engagement with the cam-faces 11 of the lugs 10 by imparting to the cap a partial rotation after the extension 13 of the cap has been introduced into the counterbore of the hub. In order to make the closure of the hub dust-proof and oil-proof, the cap 12 is formed with an outwardly-projecting flange 16, and a V-shaped groove 17 is formed in the face of the flange, which is adapted to contact with the outer end of the hub. This groove 17 is filled with any suitable packing, and when the cap is secured in position at the outer end of the hub the packing filling the groove 17 is compressed against the outer end of the hub and forms a joint therewith, which prevents the passage of grit to the interior of the hub and also prevents the escape of oil from the hub.

To facilitate the introduction of oil into the interior of the hub without removing the closure-cap 12, an inwardly-tapering aperture 18 is formed at the center of the cap, and to prevent the passage of grit through the aperture 18, as well as to prevent the escape of oil therethrough, a spring 19 is secured in the interior of the cap in such a position that it extends across the opening 18. The spring 19 is preferably fastened by means of a pair of small screws 20, which pass through the spring near one end, and at the other end the spring is bent to present a portion 21, which extends between the extension 13 of the cap and the inner end of the counterbore 9 in the hub. The normal position of the spring is indicated in Fig. 4, the terminal portion 21 of the spring lying a slight distance from the end of the extension 13 of the cap. When, however, the cap is secured in position, the terminal portion 21 of the spring is forced into contact with the extension of the cap, and the arch of the spring is pressed against a small boss 22 in the interior of the cap, through which the opening 18 is pierced. The spring 19 therefore serves, when the cap is secured upon the hub, to completely close the aperture 18 and prevent the passage of any material through the opening as long as the spring is in contact with the boss 22.

As the cap 12 is secured in position by a slight rotative movement in the counterbore of the hub and can be released by a slight rotative movement in the opposite direction, it is necessary to provide some means to hold the cap against rotation after it has been secured in position, and for this purpose the laterally-projecting lugs 23 and 24 are provided upon the cap and upon the shell 1 of the hub, respectively, these lugs being pierced by a threaded opening to receive a locking-screw 25. When the cap has been turned in the counterbore of the hub sufficiently to lock the lugs upon the cap and in the counterbore 9, the openings in the lugs 23 and 24 will be in registry and the screw 25 may be inserted. As long as the screw is in position no rotative movement of the cap relative to the hub can take place, as will be readily seen, and hence the lugs 10 and 14 will remain interlocked to hold the cap secured in position.

The retention of the cap in position upon the hub may be effected in slightly different manners, as shown in Figs. 6 and 7. In these two figures the hub and cap are shown as constructed as above described, except that the lugs 23 and 24 are omitted. The spring 19, moreover, is replaced by a spring 19ª, which is approximately as wide as one of the spaces between two adjacent lugs 10. This spring 19ª is attached within the cap so that its fixed end corresponds in position to one of the lugs 14 and its free end lies midway between the other lugs 14. The spring 19ª differs from the spring 19 in that the free end is held normally in contact with the extension 13 of the cap, as shown in Fig. 6, instead of being held at a slight distance therefrom, as shown in Fig. 4.

The cap provided with the spring 19ª is secured in position by first introducing the free end of the spring 19ª beneath one of the lugs 10 of the counterbore, then introducing the extension 13 of the cap into the counterbore, the lugs 14 passing between the lugs 10, as shown. A partial rotation is then given to the cap in the proper direction, and the cam-faces 11 and 15 of the lugs 10 and 14 respectively engage to lock the cap in position. When the retention of the cap is checked by the jamming of the cam-faces of the lugs upon the cap with the upper faces of the lugs in the counterbore, the spring 19ª will have reached the position indicated in broken lines in Fig. 7, and its elasticity will cause the spring to drop into the space between the lugs 10 on either side of the spring. The spring, therefore, will serve as a latch to prevent the rotative movement of the cap to cause the lugs 10 and 14 to become disengaged and the necessity of providing any other means for locking the cap in position is entirely obviated. The elasticity of the spring also causes it to close the aperture 18 effectively when it is in position to lock the cap in place.

In the operation of the improved car-wheel above described the distribution of the oil to all parts of the chamber is affected by the blades or agitators 7, and the increased diameter of the chamber 3 at its inner end causes

the oil to flow inward as the quantity of oil in the chamber decreases. The agitators near the inner end of the hub continue to cause the oil to pass through the passage 5 after the quantity of oil has become greatly reduced, and consequently it is unnecessary to refill the oil-chamber until the oil therein is almost wholly exhausted. The removal of the closure-cap 12 need not take place except when it is necessary to clean out the chamber, as pressure against the spring-closure within the cap will open the aperture 18 sufficiently to permit the introduction of oil through that opening.

When it is desired to remove the cap 12, it may be easily effected by simply disengaging the locking means and giving the cap a slight rotative movement in the direction opposite to that by which the cap was locked in position. If the cap be secured by means of the locking-screw 25, that must first be removed. If the cap be secured by the spring 19[a], as shown in Figs. 6 and 7, the cap may be unlocked by simply pressing through the opening 18 clean against the spring to force it inward against the inner end of the counterbore 9 of the hub. The cap may then be turned to cause the disengagement of the lugs 10 and 14.

In the construction of the improved self-oiling car-wheel it is to be understood that wear is to be diminished as much as possible by forming all wearing or bearing parts of the wheel in the hub or outside of the hub with chilled surfaces similar to the tread or flange of the wheel, as the chilling hardens the wearing-surfaces and diminishes greatly the rate of wear.

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

1. The combination with a wheel-hub having an oil-chamber therein open at one end and provided with cam-lugs at said open end, of a cap for said oil-chamber, said cap having cam-lugs for coöperating with the lugs at the end of the oil-chamber, and also having an opening for the introduction of oil, and a strap-spring carried upon the inner face of said cap and extending across said oil-opening therein and adapted to close said opening when the cap is in its normal position on the hub.

2. The combination with a wheel-hub having an oil-chamber therein open at one end, and provided with cam-lugs at said open end, of a cap for said oil-chamber, said cap having cam-lugs for coöperating with the lugs at the end of the oil-chamber, and a yielding plate carried upon the inner face of said cap and having a free end adapted to spring between two of said lugs when the cap is screwed home to lock said cap on the hub.

3. The combination with a wheel-hub having an oil-chamber therein open at one end and provided with cam-lugs at said open end, of a cap for said oil-chamber, said cap having cam-lugs for coöperating with the lugs at the end of the oil-chamber, and means for locking said cap against rotation when the same is screwed home on the hub.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELLIS TAYLOR THAYER.

Witnesses:

E. T. CRAWFORD,

LUCY J. HANSFORD.