(No Model.) 2 Sheets—Sheet 1.

F. L. SHALLENBERGER.

CAR AXLE LUBRICATOR.

No. 328,257. Patented Oct. 13, 1885.

Fig. 1.

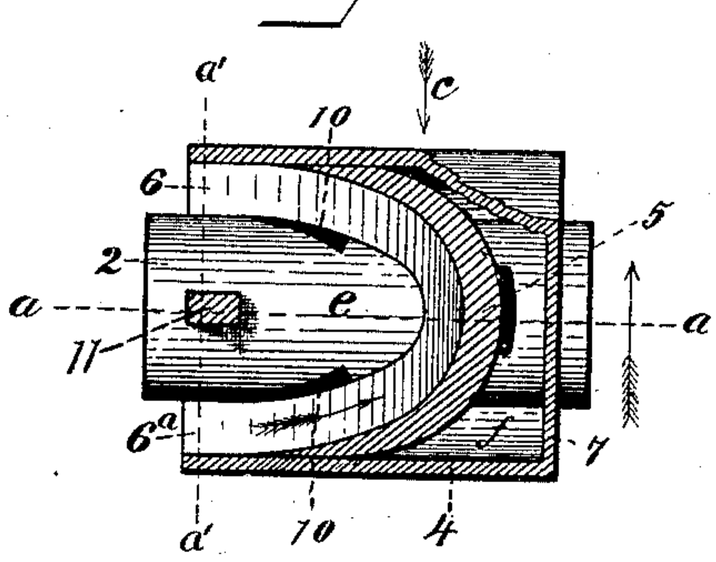

Fig. 2.

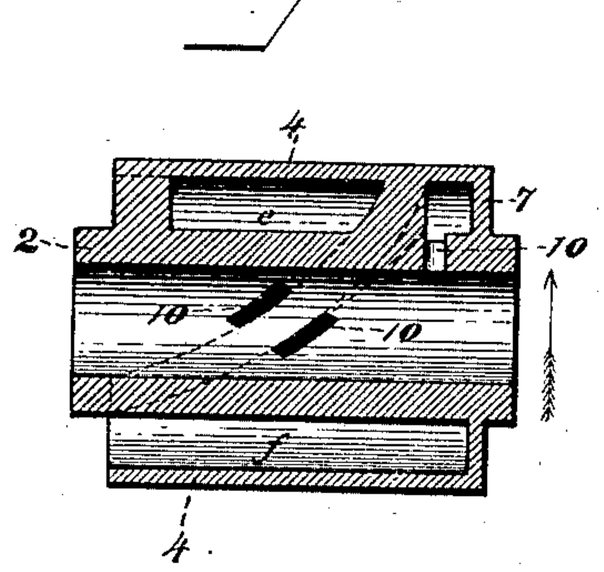

Fig. 3.

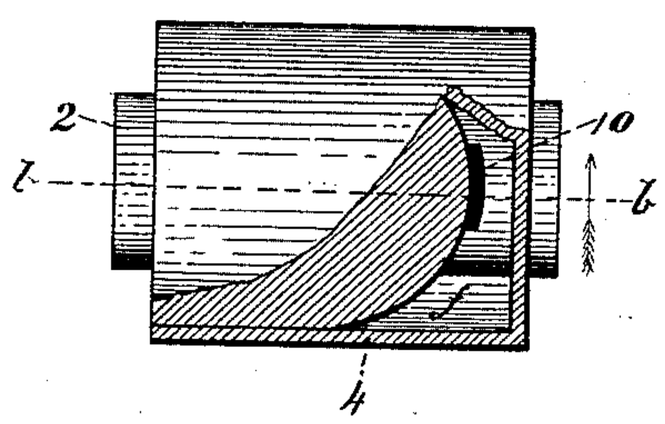

Fig. 4.

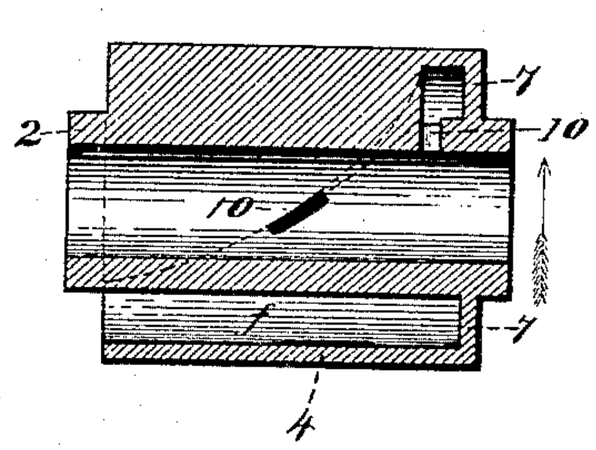

Fig. 5.

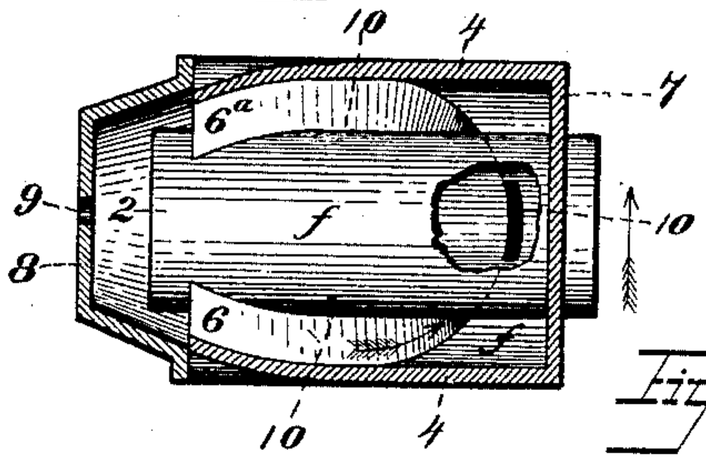

Fig. 6.

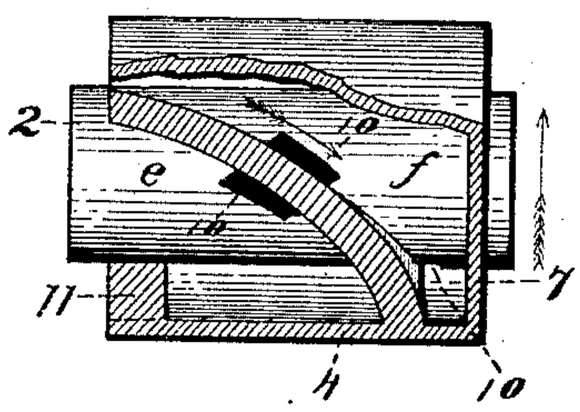

Fig. 7.

Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

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CAR AXLE LUBRICATOR.

No. 328,257. Patented Oct. 13, 1885.

Fig. 8.

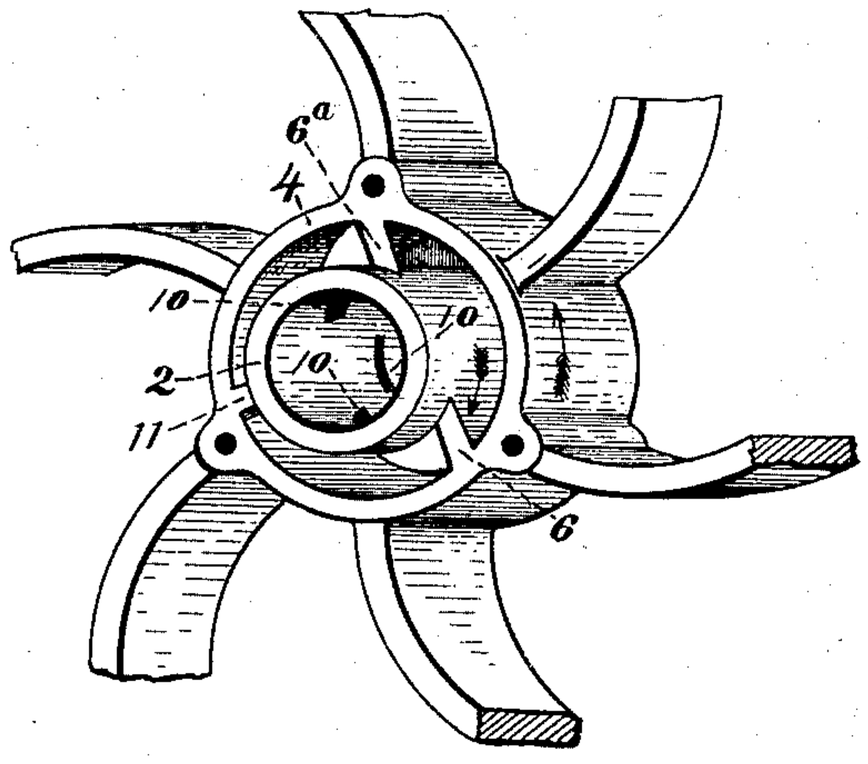


Fig. 9.

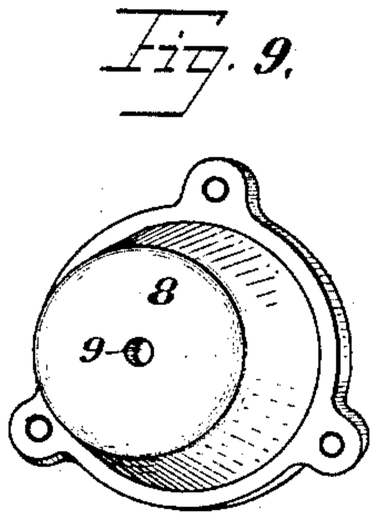


Fig. 10

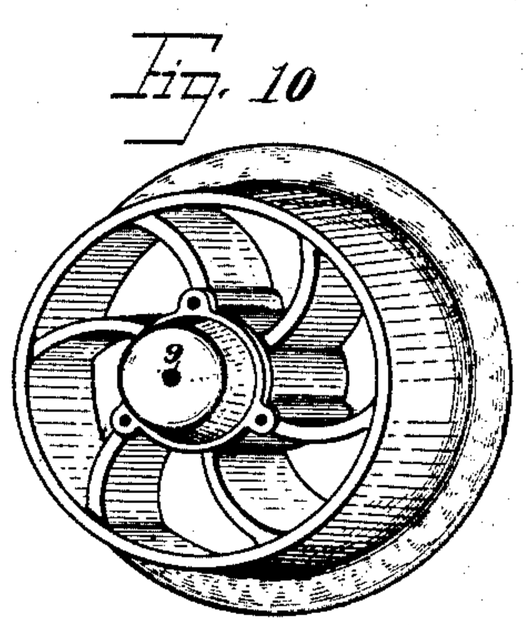
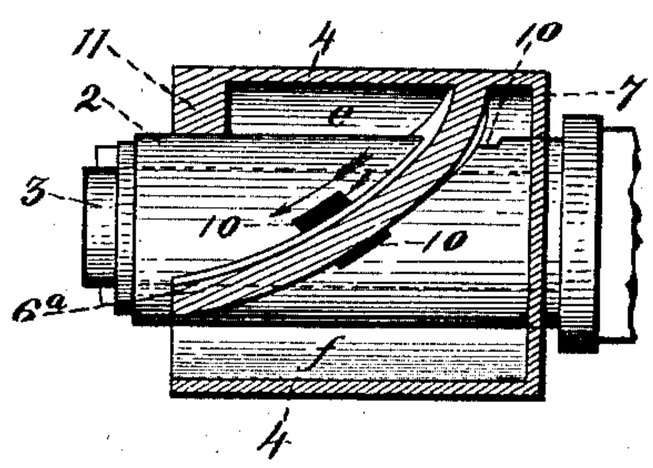


Fig. 11.



Witnesses.

J. A. Burns.

W. B. Corwin

Inventor.

Frank L. Shallenberger

by his Attorneys

Bakewell & Kerr

UNITED STATES PATENT OFFICE.

FRANK L. SHALLENBERGER, OF BRADDOCK, ASSIGNOR TO WILSON, WALKER & CO., (LIMITED,) OF PITTSBURG, PENNSYLVANIA.

CAR-AXLE LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 328,257, dated October 13, 1885.

Application filed July 24, 1885. Serial No. 172,533. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. SHALLENBERGER, of Braddock, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Axle-Lubricators; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a car-wheel hub provided with my improved lubricating device. Fig. 2 is a vertical longitudinal section on the line *a a* of Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing a modification. Fig. 4 is a vertical longitudinal section on the line *b b* of Fig. 3. Fig. 5 is a rear view of the hub shown in Figs. 1 and 3. Fig. 6 is a plan view of the hub, looking in the direction of the arrow *c* in Fig. 1. Fig. 7 is a vertical cross-section on the line *a' a'* of Fig. 1. Fig. 8 is a perspective view of the hub, shown in connection with the spokes. Fig. 9 is a perspective view of a cap for containing lubricating-fluid. Fig. 10 is a perspective view of the complete wheel. Fig. 11 is a view of the hub similar to Fig. 2, but showing it in connection with an axle.

In Figs. 1, 3, 5, and 6 the outer shell or crust of the hub is shown partially broken away for purposes of illustration. All the figures of the drawings except Fig. 10 are made on the same scale, and like figures and letters of reference indicate like parts.

My invention relates to an improvement in hubs for the wheels of cars or other vehicles in which the wheel rotates around a fixed axle; and its object is to enable the hub to carry oil for its own lubrication, and to automatically distribute the oil over the axle during its motion. A salient disadvantage in axle-lubricating devices of this class heretofore used is that the centrifugal force caused by rapid rotation of the wheel tends to fling the oil away from the axle at a time when increased friction renders the use of oil more imperative. Another common disadvantage is that revolution of the wheel forces the oil outward toward the face of the hub and leaves the inner portion of the axle-bearing comparatively unlubricated. Both of these objectionable features are completely obviated in the operation of my improved hub.

Referring to the drawings, the hub consists of two parts, an inner cylindrical shell, 2, which encircles the axle 3, and is the hub proper, and an outer shell or casing, 4, which surrounds the part 2 and is concentric therewith. Between the hub 2 and its casing there is an annular space which is designed for circulation of lubricating-oil. This space is divided by a U-shaped rib, 6 6ª, the ends of which are situate near the outer face of the hub, at any desired distance apart, preferably less than one hundred and eighty degrees. The legs of the rib are not parallel with but inclined to the axis of rotation of the hub, and are connected by a gradual recurrent curve, which crosses over its axis of curvature at a point, 5, near the butt or back part of the hub, but separate sufficiently therefrom to leave a small passage between the rib and the vertical shell 7, which forms the rear of the annular oil-space. The rib 6 6ª thus divides the oil-space into two compartments or chambers, *e* and *f*, which communicate at the front of the hub around the termini of the legs of the rib. As before stated, an annular vertical shell, 7, connects the shell 4 with the inner hub, 2, near the butt of the hub or back of the rib 6 6ª, and as a matter of construction the inner hub, its casing, the interposed rib, and the connecting-shell 7 are all cast in the same piece of metal. The inner part, 2, of the hub preferably projects beyond its casing at both ends, and at the front end an oil cap or vessel, 8, is secured to the outer casing and covers the face of the hub. There is no shell similar to the shell 7 to connect the two shells of the hub at its face, so that both the oil-chambers *e* and *f* have free communication with the oil cap or vessel 8. A suitable hole, 9, is made in the cap 8, through which the necessary oil may be supplied. Thus constructed, suppose the car-wheel to be revolving in the direction of the arrow of motion shown in the several figures, the oil from the cap 8 entering the chamber *f* will be caught by the forward side of the leg G, and by centrifugal action of rotation will be carried in a continuous current along the face of the rib within the chamber to the middle point of the rib,

where a part of it will traverse a hole, 10, made through the shell 2 at this point, and will fall upon the axle, and the remainder will reenter the oil-cap through the chamber. If the motion of the wheel be reversed, there will be a similar current of oil in an opposite direction through the chamber *f* along the rib 6ª, from the front end thereof to the hole 10 at its middle point. At intervals along the course of the oil in the chamber *f* and in the chamber *e* the inner shell, 2, of the hub is perforated with any desired number of holes, 10, and as the oil passes over them it will fall therethrough onto the axle. In this manner there will be maintained an unintermittent flow of oil through the chamber *f* and to the bearing of the axle through the holes 10, and as the hole in this can be made very near to the butt of the hub the lubricating will be effected in a perfect manner. The action of the curved rib 6 6ª in guiding the oil around the chamber prevents it from being thrown away from the axle by centrifugal force.

The oiling within the front chamber, *e*, is accomplished by the direct entrance of the oil thereinto from the reservoir, the face of the ribs therein being so inclined to the axis of rotation as not to distribute the oil in a continuous current from the oil-cap, as described with reference to the chamber *f*. The rib, however, serves to catch the oil within the chamber *e*, and to guide it into the adjacent oil-holes 10.

If desired, the hub may be strengthened by the interposition of any suitable number of standards or braces, 11, between the shells 2 and 4, preferably cast integral therewith.

I do not desire to limit myself to the use of the two oil-chambers *e* and *f*, because the chamber *e* may be omitted and substituted by a solid casting, as shown in Figs. 3 and 4. In this case the whole distribution of oil will be through the remaining chamber.

The rib 6 6ª need not be made perfectly continuous, but may be broken away at intervals to afford communication between the chambers *e f*, although I do not think that any material benefit would be derived from such construction.

The principal advantages of my improvement are as follows: First, the guide-rib being inclined to the axis of rotation of the hub the oil is carried to and distributed principally upon the back part of the journal, thereby overcoming the natural liability of a dry bearing at that place; second, the open front of the oil-chambers *e* and *f* admits of their being readily cleansed from molding-sand after the casting process, thereby precluding the destructive effects so common in wheels whose shape does not permit easy removal of the grit; third, when the wheel is revolving most rapidly and the friction on the journal-bearing is at a maximum, the oil is then most forcibly and thoroughly caused to circulate through the distributing-chambers and to the heated axle.

I am familiar with Letters Patent No. 304,359, dated September 2, 1884; but my improved lubricator differs from that principally in that I employ no recurrent groove or channel described in said patent, but employ a simple reflexed rib to guide the lubricating-oil. The features which give comparative utility to my wheel over the patented wheel are increased strength, lightness of weight, simplicity of construction, and the greater facility with which molding-sand and grit can be removed.

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

1. A hub for vehicle-wheels having an oil-chamber in its body for circulation of a lubricating medium, a reservoir for containing the latter, and an oil-passage communicating with the oil-chamber and the journal-bearing, said chamber opening freely into the reservoir as distinguished from a recurrent groove or channel made through the body of the hub and provided with a guide wall or rib which extends in a direction inclined to the axis of rotation of the hub from the front part of the chamber toward the rear and then in a recurrent direction toward the front thereof, substantially as and for the purposes described.

2. A hub for vehicle wheels having an annularly-hollowed space for circulation of a lubricating medium, a reservoir for containing the latter, and a passage or passages communicating with the oil-circulating space and with the journal-bearing, said space being divided into chambers *e* and *f* by a U-shaped rib, 6 6ª, the legs of which extend longitudinally with the bore of the hub and are arranged so as to be capable of catching oil from the reservoir during rotation of the wheel and of distributing the same, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 20th day of July, A. D. 1885.

FRANK L. SHALLENBERGER.

Witnesses:

W. B. CORWIN,

J. K. SMITH.

Letters Patent No. 328,257.

Correction in

It is hereby certified that in Letters Patent No. 328,257, granted October 13, 1885, upon the application of Frank L. Shallenberger, of Braddock, Pennsylvania, for an improvement in "Car-Axle Lubricators," an error appears in the printed specification requiring the following correction: In line 97, page 1, the reference letter "G" should be stricken out and the reference figure *6* inserted instead; and that the Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 20th day of October, A. D. 1885.

[SEAL.]

H. L. MULDROW,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.