No. 825,757. PATENTED JULY 10, 1906.

E. A. RECORD.

OIL CUP.

APPLICATION FILED MAY 11, 1905.

Fig. 1.

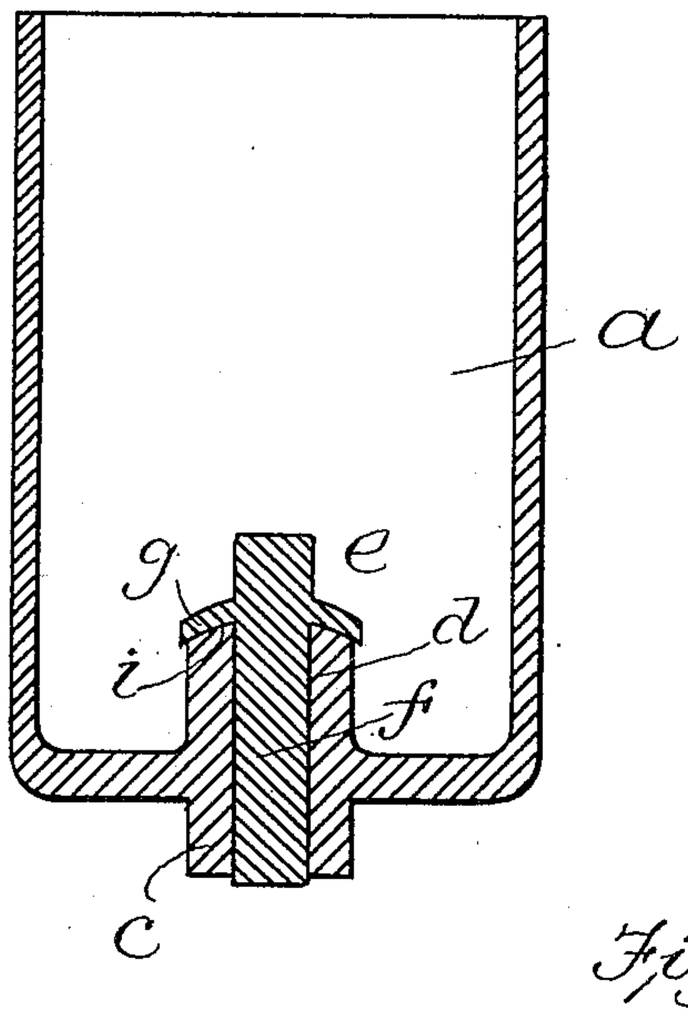


Fig. 2.

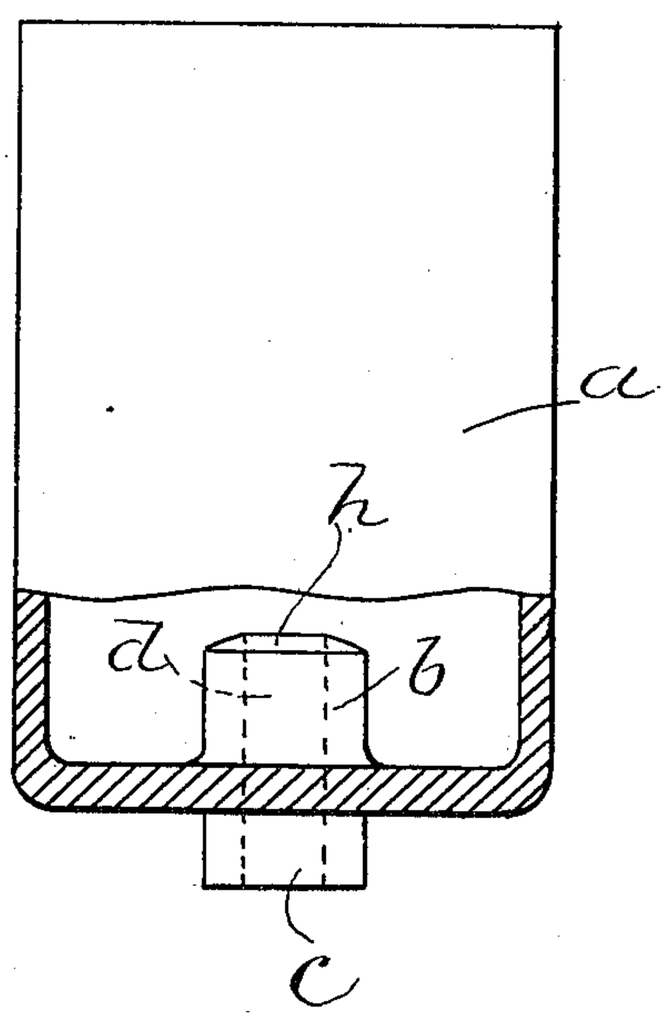


Fig. 3.

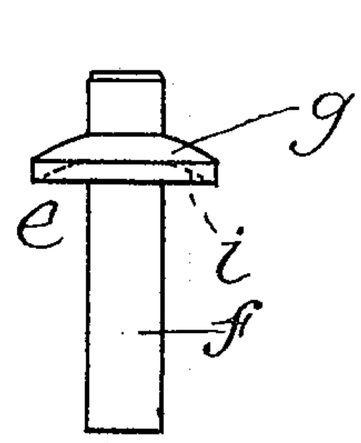
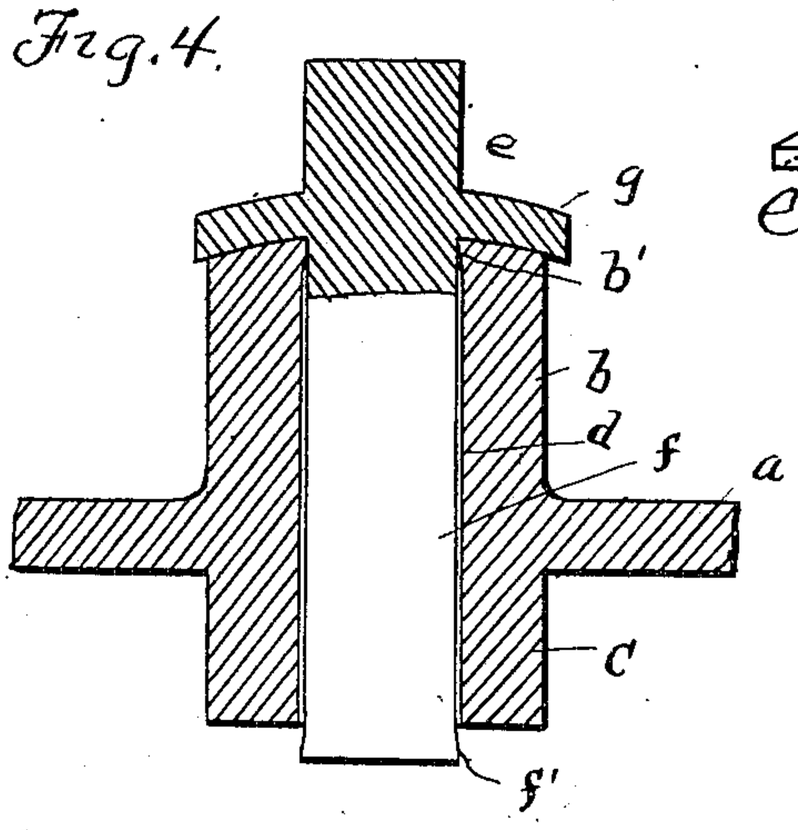


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWIN A. RECORD, OF MEDFORD, MASSACHUSETTS.

OIL-CUP.

No. 825,757. Specification of Letters Patent. Patented July 10, 1906.

Application filed May 11, 1905. Serial No. 259,972.

To all whom it may concern:

Be it known that I, EDWIN A. RECORD, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Oil-Cups, of which the following is a specification.

This invention relates to oil-cups designed particularly for application to journal-bearings of movable structures, such especially as street and railway cars; and its particular object is to feed oil to the wheel-bearings while the car is in motion and to stop the flow of oil entirely when the car is stationary. To that end I have embodied the invention in the novel form of oil-cup and valve therefor illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical central section of the oil-cup and valve. Fig. 2 represents an elevation of the oil-cup with one side partly broken away. Fig. 3 represents an elevation of the valve. Fig. 4 represents in section and on an enlarged scale the valve and parts of the cup immediately adjacent thereto.

The same reference characters indicate the same parts in all the figures.

The oil-cup body *a* is intended to be held in any desired secure manner over one of the axle-bearings of a car, particularly a street-car. It is capable of other applications; but the one for which it is primarily intended and best adapted is that above referred to. Within the cup and rising from the bottom thereof is an internal boss *b*, and externally of the cup in line with said boss is a nipple *c* of sufficient length to carry the oil flowing through a passage in the same away from the bottom of the oil-cup to the bearing.

Through the boss *b* and nipple *c* is formed a bore *d*, making a vertical passage through which oil may flow from the interior of the cup to the bearing and for which there is provided a valve *e*, consisting of a tubular stem *f* and an annular flange *g*, surrounding the same. The passage *d* and stem *f* are both cylindrical and turned with diameters nearly equal, that of the valve-stem being only slightly smaller than that of the passage, so that the stem fits closely in the passage, there being only sufficient play to permit it to move up and down when displaced by the vibrations of the car. In such movements the part of the stem which rises above the upper part of the boss becomes coated with oil, and this part falling a short distance through the passage carries a thin film of oil between the walls of the stem and passage, this film being gradually caused to work down through the extremely-narrow space surrounding the valve-stem by the joltings of the car and successive movements of the stem until it finally emerges from the bottom of the passage and drips on the bearing.

In order to prevent leakage of oil through the passage and around the stem when the car is stationary and free from vibration, I provide the flange *g*, which seats upon the upper surface of the boss *b*, making a tight enough connection to prevent leakage of oil.

For the purpose of making the joint as tight as possible and most effectively preventing leakage the valve-seat *h*, formed upon the upper surface of the boss *b* and surrounding the passage *d*, is made spherical with a convex curvature, so that it slopes downward and outward on a curved line in all directions from the edge of the passage to the sides of the boss. The valve-flange *g* has a correspondingly-curved concave spherical seating-surface *i*, which is ground so as to fit with absolute accuracy on the seat *h*. Thus when the car is stationary the valve rests upon the seat *h*, bearing with sufficient tightness to prevent leakage of oil. When, however, the car is put in motion and driven over an uneven track, it is jolted and vibrated, which causes the valve to rise and fall rapidly, separating the valve-flanges *g* from its seat sufficient to allow a certain quantity of oil to flow in and supply a film upon the valve *h*, which film is then carried down to the bearing in the manner previously described.

To keep the valve from being entirely thrown out of the passage *d* by severe joltings, I prefer to upset and widen its lower end slightly, as shown at *f'* in Fig. 4, and also contract at *b'* the upper opening of the passage, so that the end of the valve-stem is slightly larger than the opening of the passage, and thus accidental removal of the valve is prevented. Fig. 4 illustrates in an exaggerated way these features, the differences in diameter of the valve-stem and passage being greatly increased to permit illustration of the enlarged valve end and contracted mouth of the passage, the variation in diameter of these parts being actually so slight as scarcely to be perceptible.

By forming the valve-seating surface *h*

with a convex spherical curvature the outer periphery of the seat is thus at a lower level than the opening to the passage, and, further, by having the spherical curvature of the seat and valve a closer fit and one in which more points are in contact is thus produced than when the surface is either plane or conical. Thus the valve is more positive and effective, and thinner oil can be used with it than with valves of either of the characters referred to. By making the valve-stem of a size to fit closely in the aperture and also making the same solid I can secure a finer regulation in the amount of oil fed than with valves in which wide spaces are left between their stems and the outlet-passages or those which are internal passages. When a valve which fits very closely is used, the flow of oil is much restricted in amount except when the car is in motion and the stem thereby reciprocated by its vibrations.

I claim—

1. An oil-cup having an outlet-passage, a valve having a close sliding fit in said passage and movable longitudinally therein, and a projection forming part of the valve having its under surface inclined outwardly and downwardly therefrom, adapted to seat against a complemental surface beside the passage.

2. An oil-cup having an outlet-passage, a solid cylindrical valve having a close sliding fit in said passage and movable longitudinally therein, and an outwardly and downwardly inclined seating portion surrounding a part of the valve adapted to coöperate with a complemental seat surrounding the passage.

3. An oil-cup provided with an internal boss having a vertical passage therethrough, its upper surface surrounding the passage being formed with a convex spherical curvature, and a valve comprising a solid stem closely fitting on all sides the said passage and a flange formed on its under side with a concave spherical surface ground to fit the spherical surface of said boss.

4. An oil-cup provided with an internal boss having a vertical passage therethrough, its upper surface surrounding the passage being inclined downwardly toward its periphery, and a valve comprising a stem fitting said passage closely with a sliding fit and a complementally-inclined portion adapted to seat on the inclined surface of said boss.

5. An oil-cup provided with an internal boss having a vertical longitudinal cylindrical bore the upper end of which is slightly contracted, and a solid cylindrical valve-pin slidingly mounted in such bore and having its lower end upset to a diameter less than the internal diameter of the main portion of the bore but greater than that of the contracted upper end thereof.

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

EDWIN A. RECORD.

Witnesses:

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