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CAR WHEEL LUBRICATOR.
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Inventor:

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By

Attorney.

THE HANCOCK PETERS CO., WASHINGTON, D.C.
To all whom it may concern:

Be it known that I, MATTHEW CAMPBELL, of Mount Savage, in the county of Allegany, State of Maryland, have invented certain new and useful Improvements in Car-Wheel Lubricators, of which the following is a complete specification, reference being had to the accompanying drawings.

The present invention relates to improvements in lubricators for car-wheels, and particularly, but not exclusively, to mine-car wheels of that class in which a supply of liquid lubricant, preferably carried in compartments provided for it in the wheel, is fed between the box and the axle of the wheel through the relative movements of those parts.

Car-wheel lubricators of the general class referred to have been long known in the art to which they relate and there is no novelty claimed for the present invention in respect to the provision of means for the mere passing of a liquid lubricant from one compartment of a wheel to another between the box and the axle and in contact with both of those members; but there is novelty as well as great utility in providing means for arriving at the object of the present invention, which is to produce improvements in the class of devices above referred to, whereby the efficiency of the device as a whole as a means of lubrication of a wheel through its rotation is increased, and whereby also adequate provision is made against the drying out of a lubricant from between the bearings of the wheel and its axle during ordinary periods however protracted when the car is idle and its wheels are at rest.

There are a number of car-wheel lubricators which may be relied upon to afford some degree of lubrication, more or less satisfactory, to a car-wheel during its periods of activity, but there are none which may be relied upon to take up operation after any considerable period of inactivity without special attention and preparation prior to resump-
ber, of oil-tight compartments, preferably carried between the tread 1 and the hub 5 of the wheel. Such compartments may be readily formed by providing a face-plate 10, uniting adjacent spokes 3, between which also the web 4, if it be non-continuous, extends. Each of the plates 10 is preferably provided with a filling-aperture, provided, preferably, with a tap 12 for opening and closing it.

The construction of the wheel above specified constitutes a simple, economical, and therefore preferred form of embodiment of my present invention; but it should be distinctly understood that it is presented only as a representative form of embodiment of my invention, which I do not intend to limit to any of the structural details herein specified, nor even to that general form of embodiment preferred, in which the oil-compartments are contained exclusively within and are carried by the wheel.

Means of direct communication between each oil-compartment and the axle is provided in an elongated narrow slit 15, which penetrates the hub and is disposed endwise within the same. It is a characteristic and important feature of my invention that the several slots 13 are disposed, respectively, in planes parallel to the longitudinal axis of the axle 9 or bore of the hub.

By the aid of the slots 15 provision is made for the direct supply of lubricant from one or another of the plurality of oil-compartments;

but without other provision there would necessarily follow in practice leakage and waste of the lubricant from between the bore of the hub and the axle, a wasteful condition which is present in many types of car-wheel lubrications now in use. To overcome this objection, I provide a series of grooves, preferably V-shaped in cross-section and three in number—to wit, 16, 17, and 18—each of which intercepts a pair of adjacent slots 15, between which slots from end to end thereof they are distributed collectively, as shown in Fig. III. The number of the grooves preferably corresponds to the number of the oil-compartments employed in the wheel. Each groove extends through the arc of a circle and preferably, but not essentially, in a direction at right angles to the slots 15. Collectively the grooves 16, 17, and 18 encircle the entire periphery of the inner bore of the hub; but they are disallowed one with another, as clearly shown in Fig. III of the drawings. Moreover, as shown in that figure, each of the slots 15 is intercepted by a plurality, preferably, of grooves. The disallowance of the grooves affords extension of the area of distribution of the lubricant in passing by gravity from one or more compartments to another compartment or compartments. At the same time through the employment of a plurality of grooves for each slot ample provision is made for the passage without waste or leakage of the lubricant between compartments, means of communication between which is afforded by the grooves.

The presence within the hub of the slots 15 having disallowed grooves, establishing communication between adjacent slots, affords means of lubrication to the bearing-surfaces of the hub and axle in service without leakage or waste of lubricant, while, on the other hand, the presence of the slots 15, disposed with respect to the axle as specified and communicating with the grooves substantially at right angles, affords means of retaining within one or more of the slots a modicum of lubricant in contact with the surface of the axle and ready to perform initially a lubricating function after a wheel has remained at rest for a considerable period—protracted, it may be, through several days or even weeks. The cause which produces the effect of holding a residual quantity of lubricant in reserve during periods of rest is that the horizontal disposition of the slots 15 resists the operation of the force of gravity to drain them. If the slots 15 be made to deviate from the true horizontal in whole or in part, they will be in consequence thereof in whole or in part be drained of their contents by gravity and in comparatively little while become dry, thereby causing the wheel either to stick upon the axle or, turning upon it with difficulty, to cut its bearings.

In explaining the operation of the subject-matter of this invention the preferred form of embodiment thereof illustrated in the drawings is of course referred to, and from the explanation of the mode of operation the reason for the preference for a number of lubricant-compartments limited to three will be apparent, because it will appear that that number is amply sufficient, although possibly two compartments might suffice, and a greater number might be employed, possibly to advantage, especially in connection with an unusually long hub and axle. With this observation the operation of the device may be described as follows:

The wheel being secured upon its axle 9, each of its oil-compartments is partially filled, with oil, for example, and is closed with its proper tap 12. The quantity of the lubricant supplied to the compartments is preferably proportionate to the number of compartments. For example, if three compartments, as illustrated, be used each should be accommodated with one-third of its total capacity of oil. The several compartments all being charged with oil, as specified, there being three compartments, it follows that there must always be above the plane cutting the horizontal diameter of the axle one or more of the feed-slots 15. Con-
sequently whenever the wheel is at rest upon its axle the contents of one or more of its oil-compartments is discharged from a slot or slots 15 against the axle and flowing around the surface thereof through one or more of the grooves 16, 17, and 18 passes through another slot or slots 15 into a compartment or compartments below the plane cutting the horizontal diameter of its axle. The feed-slots 15, united by the grooves in the inner or bearing wall of the hub, afford free passage at all times for the lubricant between the different compartments and in contact with the smooth unbroken surface of the axle. Moreover, by providing non-continuous grooves application of the lubricant to different areas of surface of the axle during the rotation of its wheel is insured, the said grooves being disaligned—that is, located in different vertical planes, and therefore intercepting the feed-slots 15 at different points. With each change of position of the wheel a new feed-slot 15 is brought into requisition and each time a new groove carries the lubricant from one slot to the other around a portion of the axle. The groove referred to, constituting means for the flow of oil or other lubricant from one compartment to another, are widely distributed—that is to say, the flow of lubricant does not always follow the same course, but is distributed in its flow over all surfaces of the axle, dependent in part upon the position which the wheel assumes when at rest. Besides the means provided, as specified, for preserving through extended periods a residual quantity of lubricant within the uppermost slot or slots 15 when a car is at rest the ordinary flow of the lubricant, in the manner previously referred to, is retarded and slowed, and it therefore in itself promotes the continuance of the wheel and axle in good working order during considerable but ordinary periods of enforced idleness, when without special provision to the contrary they would dry out, requiring considerable time and expense to insure their being in good order whenever called into requisition after having remained idle for a period. This is an important and valuable feature of my invention.

What I claim is—

1. A wheel provided with a plurality of lubricant-compartments and with a hub having elongated, narrow slots making direct communication between the interiors of the compartments and the bore of the hub, respectively, and disaligned grooves in the inner face of the bore of the hub connecting adjacent slots, said grooves being distributed between the slots from end to end thereof, collectively.

2. A wheel provided with a plurality of lubricant-compartments and with a hub having elongated, narrow slots making direct communication between the interiors of the compartments and the bore of the hub, respectively, and grooves in the inner face of the bore of the hub connecting adjacent slots, a plurality of grooves being provided in communication with each slot.

3. A wheel provided with a plurality of lubricant-compartments and with a hub having elongated, narrow slots making direct communication between the interiors of the compartments and the bore of the hub, respectively, and disaligned grooves in the inner face of the bore of the hub connecting adjacent slots, a plurality of grooves being provided in communication with each slot.

4. A wheel provided with not less than three lubricating-compartments and with a hub having an elongated, narrow slot for each compartment making direct communication between its compartment and the bore of the hub, and a corresponding number of disaligned grooves in the inner face of the bore of the hub, each groove serving to connect adjacent slots.

5. A wheel provided with not less than three lubricating-compartments and with a hub having an elongated, narrow slot for each compartment making direct communication between its compartment and the bore of the hub, and a corresponding number of disaligned grooves in the inner face of the bore of the hub, each groove serving to connect adjacent slots, and each slot being provided with a plurality of intercepting grooves.

6. A wheel provided with a plurality of lubricant-compartments and with a hub having elongated, narrow slots making direct communication between the interiors of the compartments and the hub, respectively, and means of operative communication between adjacent slots, each of said slots being disposed in a plane parallel to the horizontal axis of the bore of the hub.

7. A wheel provided with a plurality of lubricant-compartments so disposed with respect to the wheel and to each other that one or more of said compartments must be above the horizontal or longitudinal axis of the axle whenever the wheel is at rest, narrow, elongated slots establishing communication between the interiors of the compartments and the hub, respectively, means of operative communication between said slots formed in the inner face of the bore of the hub, each slot being located in a plane parallel to the longitudinal axis of the bore of the hub, said slots and means of communication collectively constituting distributive means of communication for flow of lubricant between the said several compartments, by way of the bearing-wall of the hub and against the axle, whereby, whenever the wheel is at rest upon its axle, the contents of one or more of its
oil-compartments, located above a horizontal plane cutting the longitudinal axis of the axle, finds means of discharge into a compartment or compartments below said horizontal plane, but leaving a residual quantity of lubricant undrained within the uppermost slot or slots.

In testimony of all which I have hereunto subscribed my name.

MATTHEW CAMPBELL.

Witnesses:

Patrick Barrett,

C. O. Goodrich.