

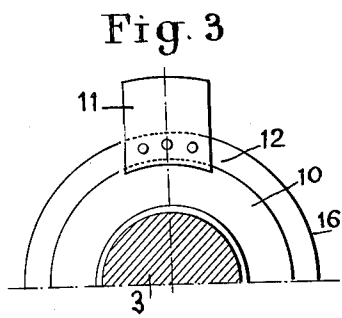
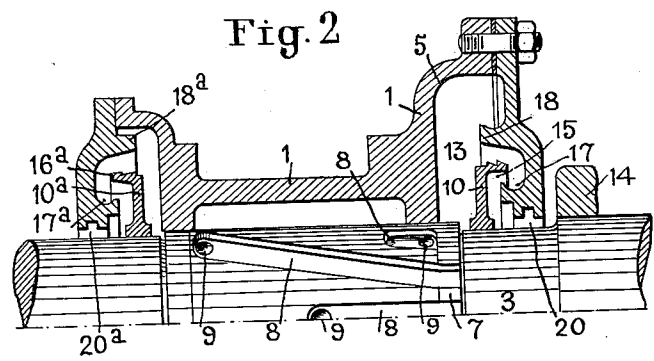
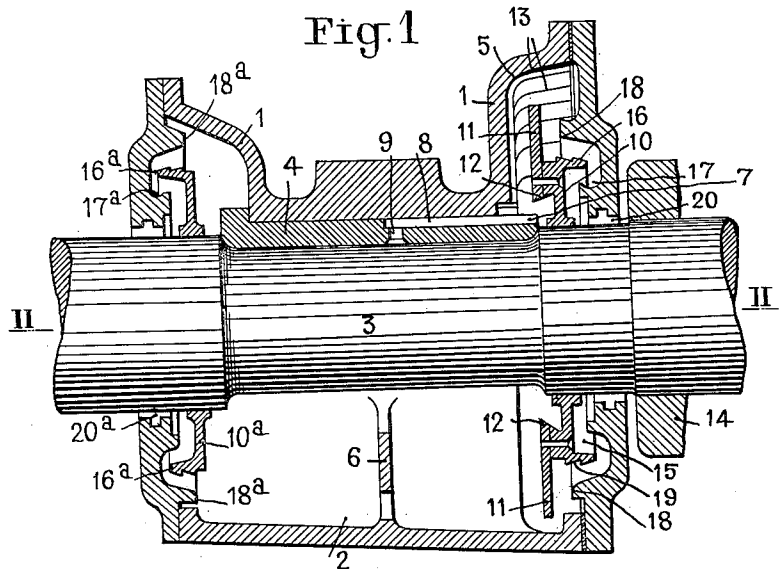
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AXLE BOX

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AXLE BOX

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I have filed an application in France dated 8th August, 1928.

The present invention has for its subject an axle box which is closed in a fluid-tight manner and effects automatic lubrication by a closing and lifting disc, the axle box being more particularly applicable to tramways and other vehicles running on rail tracks.

The present invention is characterized in that the lubrication is effected by means of a disc secured to the rear end of the axle, which disc lifts the oil from the lower portion or container of the axle box so as to conduct it to the upper portion of the bush, this disc at the same time forming a centrifugal closing device which prevents any oil from flowing to the outside of the axle box.

The axle box consists of the following elements: the bush, the lifting and closing disc, the oil container, the inner wall of the axle box, and more particularly its rear wall of suitable shape, as also the grooves or the projections having a suitable outline, all these elements being combined so as to ensure at all speeds of the vehicle the uniform circulation of the oil between the surfaces in frictional engagement, while preventing any loss of oil due to flow along the axle in particular.

In order that the invention may be readily understood it will be described hereinafter, solely by way of example, in connection with one form of construction illustrated in the accompanying drawing, wherein:

Figure 1 is a vertical section of the axle box and of the end of the axle along a plane passing along the axis of the axle.

Figure 2 is a half section along a horizontal plane passing along the axis of the end of the axle, on the line II—II of Figure 1, and

Figure 3 is a half front view of the lifting and closing disc.

Referring first to Figure 1, there is indicated at 1 the body of the axle box forming an oil container 2 at the lower portion thereof. 3 is the end of the axle and 4 is the bush.

The oil container 2 is provided with partitions so as to limit the movements of the oil, particularly in the cases of changes of direction or by reason of the oil moving or swaying as the car or cars turn on curves at

various speeds. One of these partitions is indicated at 6 in Figure 1.

Lubrication is effected from above: the oil is conducted by a lifting disc 10 to a recess 7 in the upper portion of the bush 4, flows along grooves 8 up to the bores 9 which pass through the bush and thus reaches the surfaces in frictional engagement.

This disc 10, constructed in the form of a ring keyed to the axle 3 or secured thereto in any other suitable manner, is of a section clearly shown in Figure 1. At one or more points of its periphery are secured blades 11 which form the lifting device proper. These blades when partaking of the rotary movement of the axle dip into the oil in the container 2 when they pass through the lower portion of the box and by capillarity they carry away a quantity of oil which they convey to the upper portion.

At slow speeds this oil flows directly by gravity into the recess 7 of the bush 4 by running off the edge 12 forming a gutter.

At higher speeds the oil carried away by the blade 11 is projected by centrifugal force against the inner wall 5 of the box 1. This wall 5 is directed in such a manner as to conduct the oil which flows over it towards the recess 7 of the bush. For this purpose the wall 5 is also provided with grooves 13 of suitable shape.

At intermediate speeds oil passes both along the edge or gutter 12 and is projected by centrifugal force: the lubrication is thus efficiently ensured.

When the vehicle stops for example drops of oil are liable to flow along the face of the disc 10 adjacent the wheel 14 and tend to escape to the outside along the axle. In order to prevent this loss of oil the disc itself by reason of its shape combined with the shape of the box, constitutes a centrifugal closing device and prevents this outflow of oil. For this purpose the disc is formed in the shape of a circular basin 15 turned towards the side of the wheel 14. Its edge 16 partly overlaps a gutter 17 formed on the rear wall of the box and the edge 16 is also surrounded by a circular rib 18 provided on this wall, this rib also forming a basin like

covering for the disc. Bevelled edges 19 provided on the outer surface of the edge 16 of the basin 15 also oppose the direct outward flow of oil.

- 5 From the foregoing it will be seen that the arrangement described prevents the outflow of oil.

During stoppages the oil can only flow towards the lower part of the disc 10 by following the circular grooves formed by the bevelled edges 19 or follow along the edge 16 into the gutter 17. In this manner all the oil is returned to the container 2 by the gutter 17 and the rib 18.

- 15 During operation the oil which is on the closing disc 10 is projected by centrifugal force against the inner face of the rib 18 which returns it to the container 2.

The device is completed by a suitable device of any known construction indicated at 20 for preventing the admission of dirt, mud and the like.

At the other or outer end of the end 3 of the axle there is mounted a disc 10a acting as a closing device and which is not provided with a lifting blade, this disc acting in the same manner as the disc 10 by means of its edge 16a. It is combined in the same manner as the disc 10 with corresponding shapes of the axle box, particularly the gutter 17a, the circular rib 18a and the device 20a for preventing the admission of mud, dirt and the like.

In the example illustrated in Figure 1 it is assumed that the axle projects from opposite ends of the axle box and in these cases the axle is provided adjacent the end thereof or at the rear of the axle box with a lifting and closing disc 10 and at the other end with a simple closing disc 10a. The invention, however, is applicable to an ordinary axle box having a single lifting and closing disc 10 at the rear thereof, and, in this case, it is particularly applicable for example to the ends of axles provided with a key known as a guillotine.

It will be understood that without departing from the scope of the invention that the device described may be modified in various ways and that any suitable materials may be used for carrying it into effect. The shapes illustrated may also be modified whilst retaining the conditions indicated and achieving the general result aimed at.

Thus for example it is possible to vary the number, shape and position of the blades 11 and to modify the section of the closing disc 10 and the shape of the rear face of the box, in combination one with the other, provided that the whole always returns to the container 2 either by gravity or by gravity and centrifugal force in combination, the oil which tends to pass to the outside of the axle box.

I claim:—

1. An axle box comprising a casing of which the bottom is inclined and forms an

oil container, said casing being adapted to be non-revolubly mounted on an axle, front and rear cover plates secured to said casing, a disc secured to said axle at the rear end of said casing, a plurality of blades secured to the periphery of said disc, said blades being adapted to dip into the oil contained in said oil container, a bush mounted in the upper end of said casing and bearing on said axle, said casing having its rear wall curved towards said bush and having grooves therein, oil being adapted to be conducted to the upper surface of said bush by said blades and by said grooves, a laterally projecting flange on said disc, a laterally projecting rib on said rear cover, and a gutter on said rear cover, the laterally projecting flange projecting between said laterally projecting rib and said gutter.

2. An axle box comprising a casing of which the bottom is inclined and forms an oil container, said casing being adapted to be non-revolubly mounted on an axle, front and rear cover plates secured to said casing, a disc secured to said axle at the rear end of said casing, a plurality of blades secured to the periphery of said disc, said blades being adapted to dip into the oil contained in said oil container, a bush mounted in the upper end of said casing and bearing on said axle, said casing having its rear wall curved towards said bush and having grooves therein, oil being adapted to be conducted to the upper surface of said bush by said blades and by said grooves, a laterally projecting flange having annular grooves on its outer surface on said disc, a laterally projecting rib on said rear cover, and a gutter on said rear cover, said flange projecting between said rib and said gutter.

3. An axle box for the purpose described comprising a casing having the bottom thereof inclined upwardly from the rear towards the front, said casing having its upper wall outwardly flared at the rear end thereof, said casing being adapted to receive an axle, front and rear cover plates secured to said casing, a bush in the upper portion of said casing and bearing on said axle, a disc secured to said axle inside said casing and adjacent the rear cover plate, a plurality of blades secured to the periphery of said disc, said bush having an annular recess, grooves and bores therein which communicate with one another, said outwardly flared portion having grooves therein, a lateral flange on said disc projecting towards said rear cover plate, a lateral annular rib on said rear cover plate projecting towards said disc, and an annular gutter on said rear cover plate on its face adjacent said disc, said flange engaging between said rib and said gutter.

4. In combination with an axle box according to claim 3, a second disc mounted on said axle in said casing and adjacent the front

cover plate, the upper portion of the casing being outwardly flared near the front end thereof, a flange on said second disc projecting towards the front cover plate, an annular rib on said front cover plate projecting towards said second disc, and a gutter on the face of the front cover plate adjacent the second disc, the flange on the second disc projecting between the rib and gutter on the front cover plate.

5. In combination, a journal box inclusive of an end wall having an opening therein, an axle extending through said opening into the box and journaled within the latter, means for supplying lubricant to the axle journal, and means to prevent escape of lubricant from the box through the opening in the aforesaid end wall of the box, said last named means comprising a disk mounted on the axle for rotation therewith, a lateral flange on the disk extending towards the end wall of the box, a gutter formation extending toward the disk from the inner face of the end wall of the box and disposed inwardly of said flange, and another formation extending from the inner face of the end wall of the box and overlying the outer face of said flange, the said last mentioned formation being adapted to receive lubricant projected from the disk by centrifugal force and being disposed to have lubricant drain therefrom into said gutter formation, and said gutter formation being constructed to return lubricant which may enter the same to the bottom of the journal box.

6. In combination, a journal box inclusive of an end wall having an opening therein, an axle extending through said opening into the box and journaled within the latter, means for supplying lubricant to the axle journal, and means to prevent escape of lubricant from the box through the opening in the aforesaid end wall of the box, said last named means comprising a disk mounted on the axle for rotation therewith, a lateral flange on the disk extending towards the end wall of the box, a gutter formation extending toward the disk from the inner face of the end wall of the box and disposed inwardly of said flange, and another formation extending from the inner face of the end wall of the box and overlying the outer face of said flange, the said last mentioned formation being adapted to receive lubricant projected from the disk by centrifugal force and being disposed to have lubricant drain therefrom into said gutter formation, and said gutter formation being constructed to return lubricant which may enter the same to the bottom of the journal box, the outer face of the flange of said disk being circumferentially grooved.

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