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I. MACWAY

LUBRICATING DEVICE FOR AXLE BOXES

Filed Sept. 9, 1926

Fig. 1

Fig. 2.

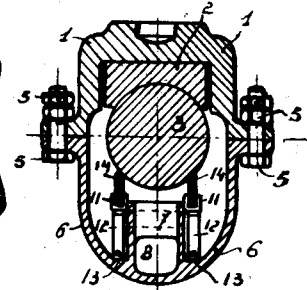
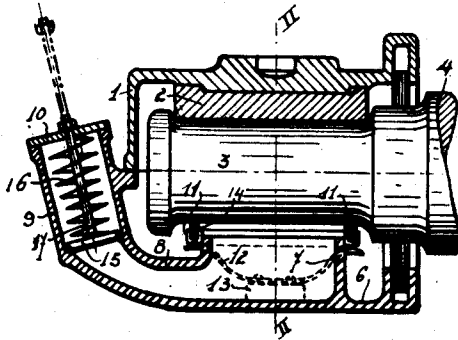


Fig. 3

Fig. 4

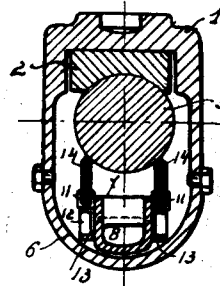
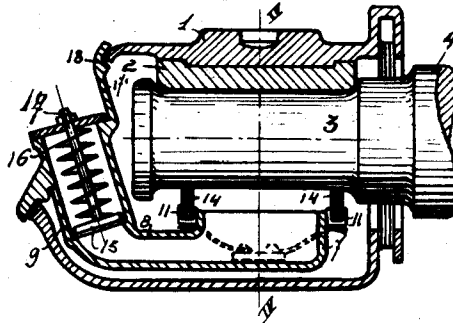
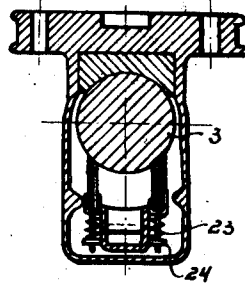
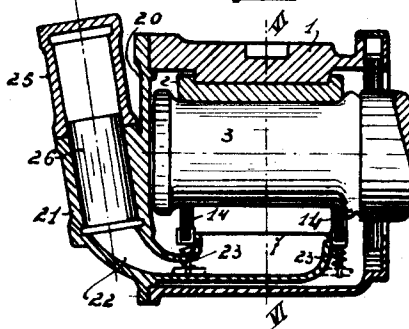


Fig. 5

Fig. 6



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LUBRICATING DEVICE FOR AXLE BOXES.

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My invention relates to lubricating devices for the axles of the rolling stock and draw-material of railways, such as the axles of railway and tramway carriages and wagons of mining wagons and other similar carriages.

As it is well known, until now the axles of the rolling stock have always been lubricated by means of axle boxes in which oil is contained. The efficiency of these devices is greatly affected by certain conditions of working mainly by the variations of temperature. In fact when the temperature increases the viscosity of the oil diminishes and the oil becomes less adhering and less resisting to the pressure whereas on the other hand, it becomes thicker when the temperature falls, in such a manner that a suitable circulation of the oil may become impossible thus causing a defective oiling.

The device forming the subject matter of my invention has for its object to avoid these inconveniences, and to allow travel, over long distances without necessitating a refilling of the lubricating devices.

With this object in view, my invention essentially consists in the special arrangements and combinations of parts as hereinafter fully described and pointed out in the appended claims.

Referring to the annexed drawings which show as an example several embodiments of my invention,

Fig. 1 is a longitudinal vertical sectional view of an axle box.

Fig. 2 is a transverse sectional view taken on line II—II in Fig. 1.

Fig. 3 is a vertical longitudinal sectional view of an axle box, showing a modification.

Fig. 4 is a transverse sectional view taken on line IV—IV in Fig. 3.

Fig. 5 is a vertical longitudinal section of an axle box, similar to Figs. 1 and 3 but showing a further modification.

Fig. 6 is a transverse sectional view taken on line VI—VI in Fig. 5.

The axle box shown on Figs. 1 and 2 comprises, as usually an upper part 1 containing the bearing bush 2 by means of which the load is carried by the journal 3 of the axle 4 carrying the wheels of the carriage.

The upper part 1 is connected by means of bolts 5 to the lower part 6 of the box. This lower part 6 is provided inside with

a rectangular shaped cup 7 integral with a channel 8 forming on the outside of the box a cylindrical vessel 9 closed by a cover 10. The upper edges of the rectangular cup 7 project upwards to a certain distance from the lower generating line of the journal 3 and are surrounded by a metal box 11 carried on each side, by a spring 12 fixed on a boss 13 provided in the lower part 6 of the axle box. The metal box 11 which is of rectangular shape like the cup and forms a kind of groove around the said cup contains a packing 14 which is pressed by springs 12 against the periphery of the journal 3.

In the cylinder or vessel 9, a piston 15 is arranged and this piston is subjected to the action of a spring 16. The rod 17 of this piston projects above the cover 10 and acts as an indicator showing the quantity of the reserve of grease contained in the vessel 9.

When the device is working, the cup 7, the channel 8 and the vessel 9 are filled with a suitable hard fat and this fat or grease is kept in direct contact with the journal 3 through the action of the piston 15.

Consequently, when the journal revolves, it takes off separate pieces or particles of grease from the reserve of grease which is contained in the cup 7 and in the space formed by the metal box 11. These pieces or particles of grease are carried away by the rotation of the journal and are crushed or squeezed between the bearing 2 and the journal 3, thus forming a grease film which becomes thinner and thinner as the rotation of the journal progresses and which subsequently thickens again when the considered part of the journal 3 takes away new particles of grease from cup 7. A sort of pellicular bush is thus formed between the journal 3 and the bearing 2 which in this manner is permanently greased.

The journals or axles of the rolling stock or of the draw material being subjected to work in very different conditions of temperature and load, it is necessary in order to realize this method of pellicular greasing through the lower part of the axle or journal, to make use of a grease possessing certain particular features. For instance, this grease must be able to resist to a cooling of about—15° or—18° C.; on the other hand it must be able to resist also to the action

of heat, that is to say to have a softening point of at least 120° C. in order to be able to perform the greasing cold or warm without modifying its conditions of consistency or its lubricating properties. It must resist to a pressure of about 45 to 60 Kg. per cm², containing only 3 to 6% of ash, being adherent by its nature, and free of any artificial product intended to secure adhesion. Regarding these conditions, it must be observed that greases possessing these qualities are existing to-day and are already used for the greasing of bearings which are heavily loaded and subjected to great strains for instance in steel works, cement and paper manufactories and the like (see for instance: Verein Deutscher Eisenhüttenleute 1922 page 41).

It must be noted however that hitherto when such a grease was used for the greasing of a bearing, it was always in combination with greasing devices in which the grease was contained in a vessel arranged above the bearing. In none of these devices the hard grease has been applied such as in the present case against the lower free part of the journal.

Taking in consideration the information which is known about the use of greases of this kind; it must be admitted that the device above described will allow travel over particularly long distances without requiring a refilling of the device and whilst securing a perfect greasing of the greatest security.

As will be easily understood, the device as above described allows in a very simple manner, the transformation of the usual oil-boxes of the rolling stock without necessitating the whole change of such oil-boxes.

Figs. 3 and 4 show as an example, one manner of applying the invention to such oil-boxes of the ordinary type. In these figures the parts corresponding to those described with reference to Figs. 1 and 2 are provided with the same reference characters. In this construction however the vessel 9 instead of being cast with the lower part of the axle-box, makes part of the cover of the grease box and is inserted in the lower part of the said box by a lateral opening 18 in such a manner that the cup 7 which is connected to the vessel 9 by the channel 8 feeds the grease to the metal box 11 surrounding the cup 7 in the space formed by the rectangular packing 14.

Figs. 5 and 6 show another arrangement of the same kind. In this modification, in which the parts common to the constructions already described are also designated by the same reference characters, the axle-box 1 is cast in one piece which is open laterally as shown at 19. This opening is closed by a plate 20 forming a cylinder 21 provided at

its lower end with an extension 22 corresponding to the channel 8 already described. This extension forms the rectangular cup 7 which is surrounded by the packing box 11 carrying the packing 14. The box 11 which slides along the edges of the rectangular cup 7 is subjected to the action of spiral springs 23 resting on lateral projections 24 of the cup 7 and acting on the bottom side of the box 11 so as to press the packing 14 against the periphery of the journal 3. In this construction the cylinder 21 is provided with a cylindrical cover 25 and the action of the spring piston 15 is substituted by the action of a cylindrical weight 26 acting as a piston to feed the grease from the vessel 21 into the cup 7.

What I claim is:

1. In an axle box, in combination with an axle journal rotating within said axle box, a bearing bush through which the axle box is supported by the upper part of the periphery of the axle journal, a grease cup arranged in the lower part of the axle box under the axle journal, a spring pressed packing surrounding freely the said grease cup, and contacting with the axle journal, whereby the said packing is adapted to move up and down along the grease cup and is adapted to follow the movements of the journal, a grease vessel, a channel whereby the grease vessel is connected to the grease cup and means whereby the grease contained in the grease vessel is fed to the grease cup and to the lower part of the periphery of the axle journal.

2. In an axle box, in combination with an axle journal rotating within said axle box, a bearing bush through which the axle box is supported by the upper part of the periphery of the axle journal, a grease cup arranged in the lower part of the axle box under the axle journal, a metal box freely surrounding the grease cup, a packing mounted in the said metal box, springs acting upon the said metal box, whereby the packing is adapted to follow the movements of the journal, a grease vessel, a channel whereby the grease vessel is connected to the grease cup and means whereby the grease contained in the grease vessel is fed to the grease cup and to the lower part of the periphery of the axle journal.

3. In an axle box, in combination with an axle journal rotating within said axle box, a bearing bush through which the axle box is supported by the upper part of the periphery of the axle journal, a grease cup arranged in the lower part of the axle box under the axle journal, a metal box surrounding freely the grease cup and adapted to move freely along the faces of the said grease cup, a packing mounted in the said metal box, springs acting upon the said metal

box, whereby the packing is adapted to follow the movements and is held in contact with the lower part of the periphery of the axle journal, a cylindrical grease vessel, a
5 channel whereby the grease vessel is connected to the grease cup and a piston acting in the cylindrical grease vessel whereby hard grease contained in the cylindrical grease vessel is fed to the grease cup and to the lower part of the periphery of the axle journal. 10

In testimony whereof I have affixed my signature.

IGNACE MACWAY.