(No Model.) 2 Sheets—Sheet 1.

J. S. PATTEN.

CAR AXLE BOX LUBRICATOR.

No. 537,848. Patented Apr. 23, 1895.

Fig. 1.

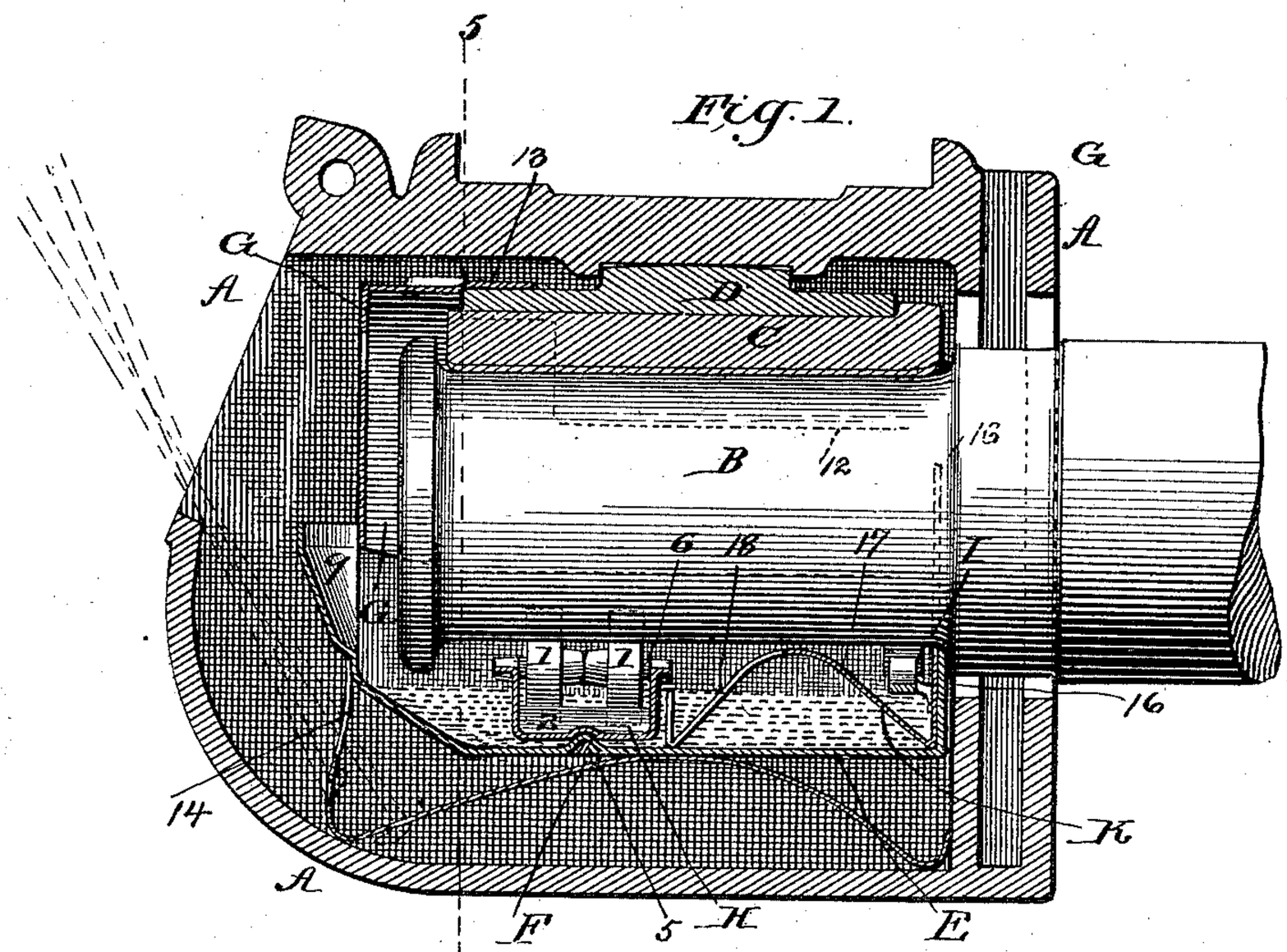


Fig. 2.

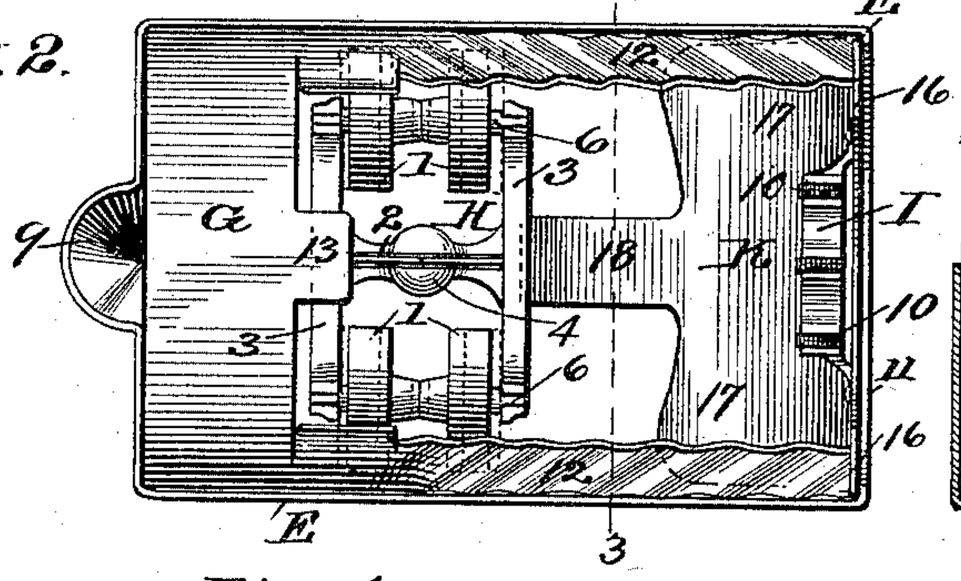


Fig. 3.

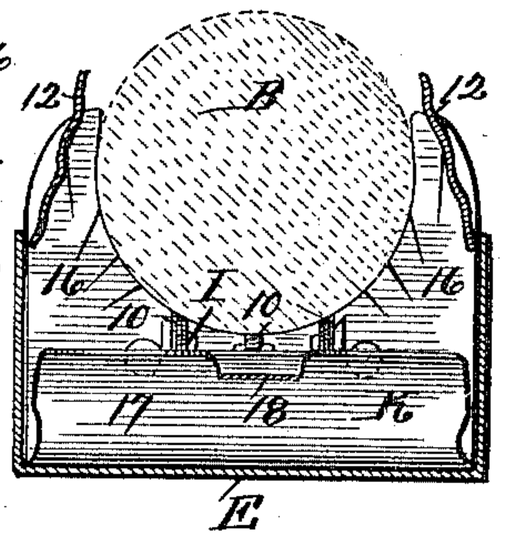
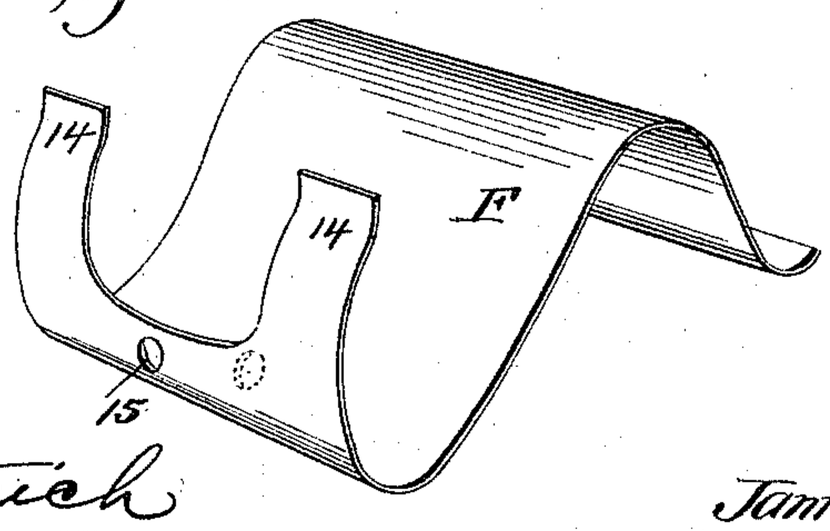


Fig. 4.



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ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

J. S. PATTEN.

CAR AXLE BOX LUBRICATOR.

No. 537,848. Patented Apr. 23, 1895.

Fig. 5.

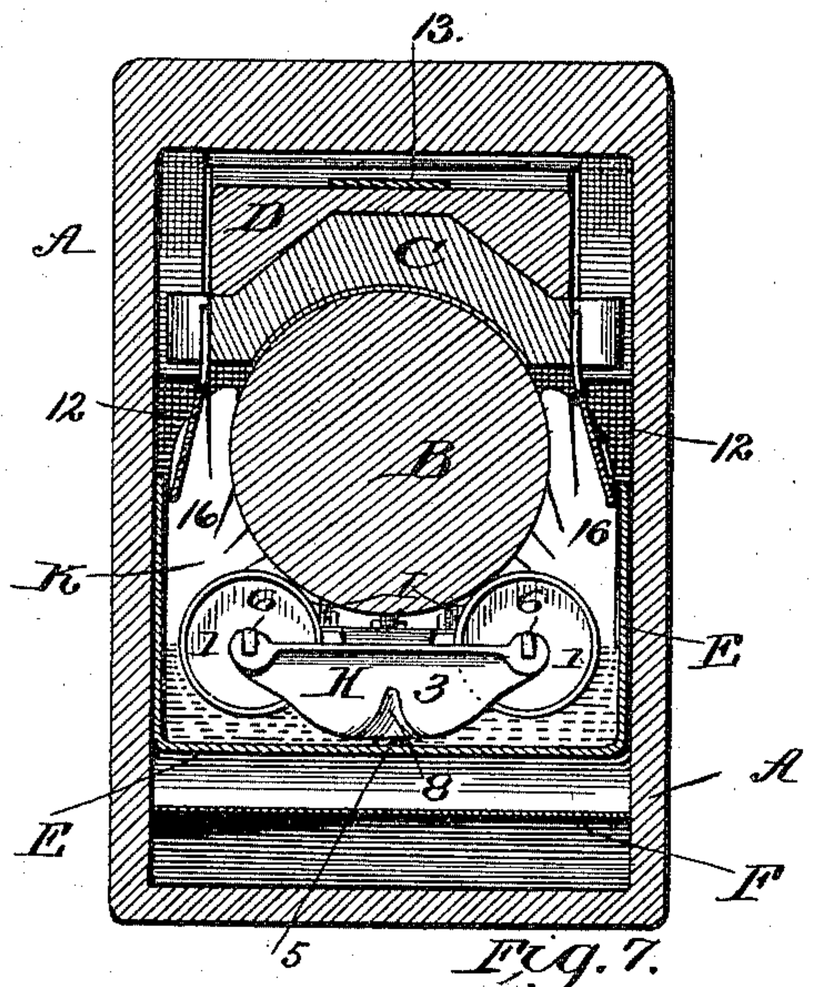


Fig. 6.

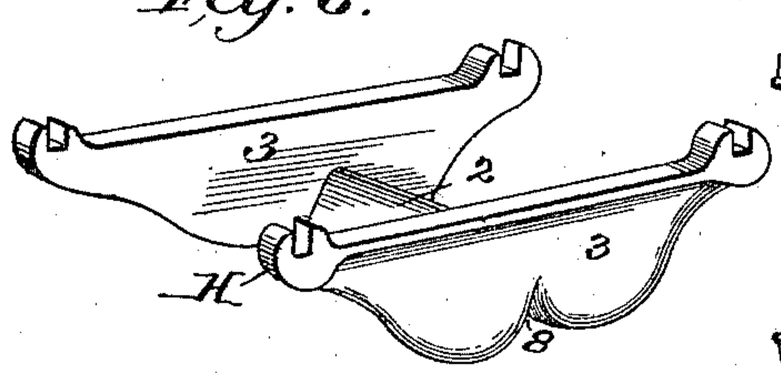


Fig. 7.

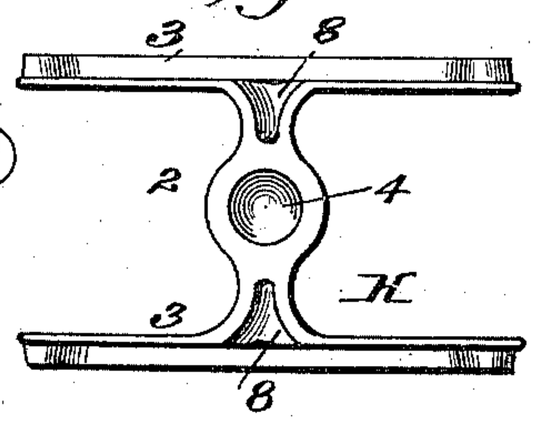


Fig. 8.

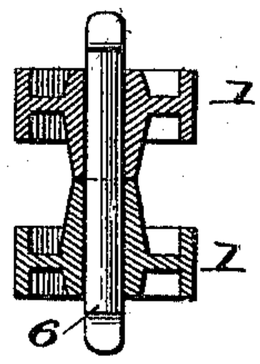


Fig. 9.

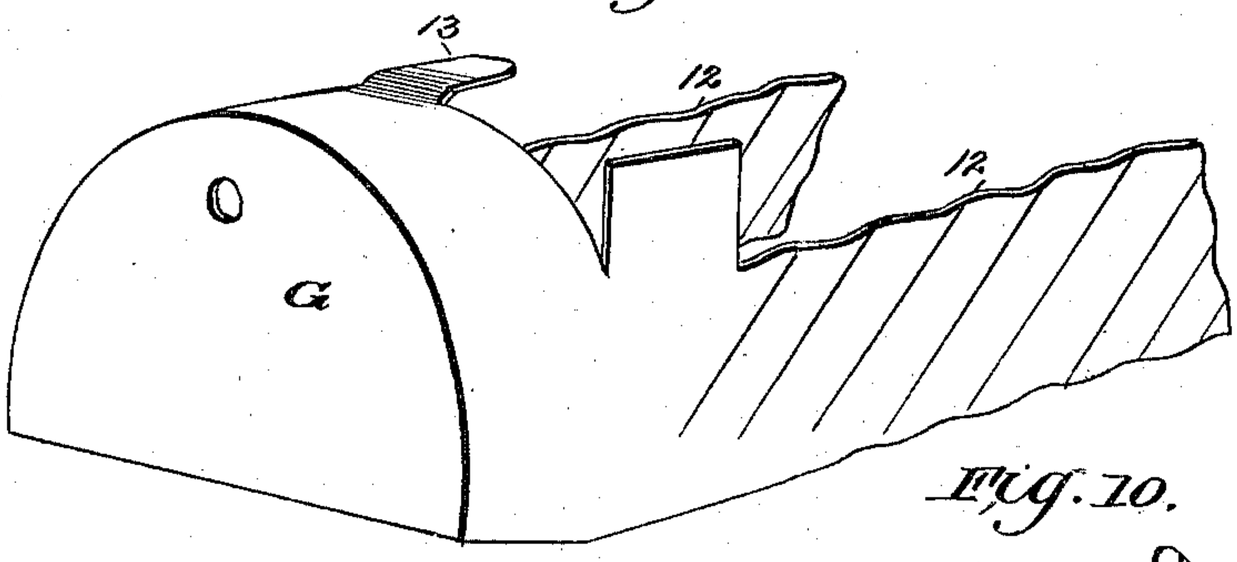


Fig. 11.

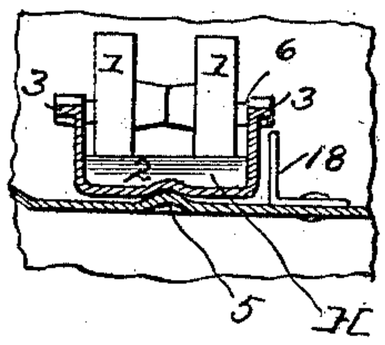
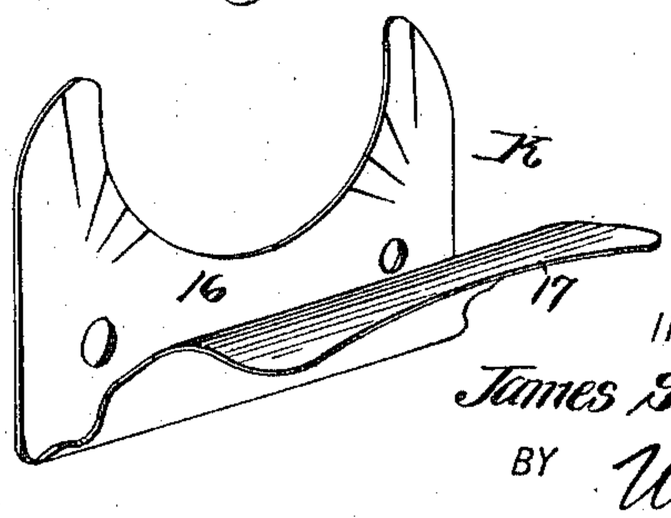


Fig. 10.



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UNITED STATES PATENT OFFICE.

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CAR-AXLE-BOX LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 537,848, dated April 23, 1895.

Application filed March 27, 1894. Serial No. 505,270. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. PATTEN, of Baltimore city, in the State of Maryland, have invented a new and Improved Car-Axle-Box Lubricator, of which the following is a specification.

I have devised certain improvements in car-axle lubricators adapted to be contained and used in axle-boxes, and have subjected the same to prolonged practical tests on cars employed in actual service in ordinary railroad traffic. Such improvements are delineated in my Patent No. 479,077, and especially in my allowed application, Serial No. 463,586, filed February 24, 1893.

The invention in the present case is an advance upon the former, and embodies certain changes in construction and combination of parts, whereby the lubricator is rendered more serviceable and efficient, and its cost and weight reduced, and durability increased.

The improvement is hereinafter set forth with the necessary detail, and shown in accompanying drawings, two sheets, in which—

Figure 1 is a central longitudinal section of a car-axle box containing my improved lubricator. Fig. 2 is a plan view of the lubricator proper. Fig. 3 is a vertical transverse section, on line 3—3 of Fig. 2. Fig. 4 is a perspective view of the plate spring which supports the lubricator proper. Fig. 5 is a vertical transverse section, on line 5—5, Fig. 1. Fig. 6 is a perspective view of the roller-carrying frame. Fig. 7 is an inverted plan of such frame. Fig. 8 is a horizontal section of the rollers. Fig. 9 is a perspective view of the journal cap. Fig. 10 is a perspective view of the baffle-plate. Fig. 11 is a detailed sectional view, showing a modification of one portion of my invention.

As in the former invention, my improved lubricator is adapted to be inserted into and contained in an axle-box, A, (Figs. 1 and 5,) of the form and construction usually employed on railroads in this country, so that its application to cars already constructed or in use involves merely the removal of the packing ordinarily used and the substitution of my lubricator therefor. The usual brass, C, and wedge, D, are also used in the present invention, and arranged in the well known manner.

As before stated, the oil used as the lubricant is contained in a box, E, supported by a spring, F, and in it are arranged rollers for taking up the lubricant and conveying it to the journal, B, with which they work in contact. A cap, G, (Figs. 1, 2 and 9) is also applied to the journal, and arranged partly within the oil-box, E; but I have greatly modified these and other parts, and also devised new features, and thereby produced a practically new lubricator which meets all the requirements discovered by practical experience.

The lubricant-holder or box, E, is constructed, preferably, of galvanized sheet-iron or other sheet metal, chiefly in order to lessen its weight and cost. The blank from which the box is formed, will, in practice, be cut out from a metal sheet, then bent into the required form by means of suitable dies, and the meeting edges united at the corners by soldering or riveting, or both. Thus constructed, the box combines in a high degree, lightness, strength, rigidity and durability.

Instead of providing the box with a notched or slotted transverse partition, adapted to serve as a baffle-plate, for preventing the liquid lubricant from flowing quickly toward one end of the box, I so construct the pivoted and rocking bearing, H, which supports the oil-take-up rollers, 1, and so arrange the said rollers in connection with such bearing, that both the latter and the rollers perform this function to a certain extent.

As shown in Fig. 7, the skeleton, cast-metal bearing, H, is substantially H-shaped, and is very light, yet strong. The central bar, 2, which connects the parallel side bars, or webs 3, 3, is provided on its under side with a conical recess, or socket, to receive the corresponding fixed pivot, 5, projecting from and formed integrally with the bottom of the oil-box, E, (Figs. 1 and 5.) The said side bars 3, 3, are made very wide (vertically) and extend down on each side of the center of the bars as near the floor of the box (Fig. 5), as practicable, and thus occupy most of the space between the rollers, 1, the journal, B, and the box bottom. The rollers, 1, are supported by

short axles, 6, (Figs. 1, 2 and 8) arranged at the ends of the side bars, 3, and are made of as large diameter as practicable, so that there is not a wide space between their lower edges and the box bottom.

It will be perceived that the side bars, 3, when thus constructed, serve practically as baffle-plates, which function is supplemented by the rollers, 1, so that the oil is, to a considerable extent, prevented from dashing from one end of the box to the other, when the cars suddenly lurch sidewise. In other words, the frame, H, and rollers, 1, serve as a baffle-plate, and thus aid in preventing sudden overflow of oil at the rear end of the box E. This result is also aided by slightly inclining the floor or bottom of the box downward toward the front, as shown in Fig. 1. The ends of the steel or iron axles, 6, (Figs. 5 and 8,) are flattened or made polygonal, to adapt them to fit in corresponding notches in the ends of the side bars, 3, of the rocking frame, H. This construction and arrangement obviously enable the axles and rollers to be readily detached. Thus, the axles may be inserted in the rollers and placed in position, or detached from the supporting frame, H, with facility and dispatch, as occasion may require. The axles being stationary, instead of rotatable, there is no wear of the frame, H, so that it will endure almost indefinitely. The bearings of the rollers being also much longer than in my previous invention, the wear incident to rotation is distributed over a larger surface, and hence the life of the rollers is correspondingly lengthened.

The rollers are adapted to slide laterally on the axles, by reason of the provision of a narrow space between them and the adjacent inner sides of the bars, 3, of frame H, as indicated by dotted lines, Fig. 2. This movement is obviously advantageous in promoting transfer of the oil to the journal, B. In very cold weather, especially when a car is not running, the oil will congeal and become stiff to a greater or less degree, but is broken up by the rotation and lateral motion or "shucking" of the rollers, so that a much larger quantity of oil is conveyed to the journal than would be otherwise practicable. This result is promoted by reason of the rollers having concave sides, as shown in Fig. 8, since such portion of the more or less congealed lubricant as is contained and adheres in the recesses thus formed, is lifted and for the most part dislodged when the rollers begin to rotate.

The rims of the rollers may be broadened until they nearly touch, in order to increase the depth and capacity of the hollow recess between the rollers, so that it will more readily hold oil when thick or congealed, and convey it to the journal when it begins to revolve.

In practice, I may employ three rollers instead of two for the purpose of more effectually breaking up and lifting the lubricant when thickened or congealed.

It is to be understood, that in applying the lubricator, to a car-axle box, A, and journal, B, the oil-box, E, is first inserted in the box, A, and then the rollers, 1, and their supporting frame, H, are placed in the said oil-box; and, lastly, the spring, F, (Figs. 1 and 4,) is pushed in under the oil-box, and rests partly flattened on the bottom of the axle-box, A. In such insertion of the rollers, 1, and frame, H, I have found it expedient and even practically necessary to provide a means for guiding the said frame, so that the pivot, 5, shall enter the socket, 4. For this purpose (as shown in Figs. 5, 6 and 7), each side bar, 3, of the frame, H, is provided centrally with a V-shaped vertical notch or groove, 8, which leads or extends inward along the under side of the central bar, 2, of said frame. When the latter, with its attached rollers, 1, is inserted in the oil box, E, the pivot, 5, will readily enter the groove, 8, and be thereby guided to its place in the socket, 4—that is to say, in the absence of the groove, the frame, H, upon striking the pivot, 5, would be liable to be thrown to one side, and thus a considerable waste of time and labor would be involved in placing the frame in the correct position.

The purpose of providing both side bars, 3, of the frame, H, with a groove, 8, is that said frame may be inserted in the oil-box, E, with either side forward.

A space must be provided between the box, E, and journal cap, G, for insertion of an oil can nozzle for the purpose of supplying oil to said box when required. In my former invention this space was formed by constructing the cap with an aperture and projecting flange, or lip, on the front end; but I now dispense with such feature, and provide the outer end of the oil-box, E, with a hollow offset or prominent projecting lip, 9, the same being formed by dies in striking up the said box. As is apparent from Figs. 1 and 2, such offset, 9, is practically a tapered chute or guide, which conducts the oil into the box. Aside from this function, the offset, or lip, subserves another and important one, in that it allows convenient inspection for determining the depth of the oil in the box, E. To the rear end of the oil-box E (Figs. 1 and 2), on the inner side thereof, I attach a metal bracket, I, which is constructed with sockets to receive blocks, 10, of leather or other kind of elastic material, which, as in my previous invention, serve as scrapers for removing from the axle-journal, B, such portion of the lubricant as may "creep" or tend to run inward along said journal. The ends, 11, of said bracket are riveted or otherwise secured to the box, E, and its body or intervening portion is separated from the box by a corresponding space, so that the oil removed from the journal, B, by said scrapers, 10, is delivered into the box, E. It will be noted, that the bracket, I, is supported clear of the bottom of the said box, and thus leaves the latter free for a baffle-plate, K, over which the bracket projects, as shown. The cap, G, be-

fore mentioned (see Figs. 2 and 9), is in this case made of sheet-metal and like the oil-box, E, struck up from the blank into the required form. It comprises the semi-cylindrical cap proper, and its extended parallel wings or side portions, 12. The cap proper fits over the end of the journal, B, (Fig. 1,) and also either comes against or fits over the adjacent end of the brass, C, and the wedge, D, and its wings, 12, extend alongside the journal, within the oil-box, and in contact with the sides of the latter (Figs. 2 and 3), from which sides they incline inward toward the journal. The said wings are provided with ribs, corrugations, or crimps arranged at an angle of say forty-five degrees. Thus the wings have a series of inclined projections or corrugations and intervening grooves, which construction provides spaces or openings, (Fig. 2,) between the wings and sides of the box, E, for return into the latter of any oil which may chance to be thrown from the journal or otherwise pass over the top edges of the wings. The inclination of the corrugations or ribs is for the purpose of preventing oil being thrown up through the aforesaid spaces, past the lower edges of the wings—that is to say, it will be observed that at a point at a short distance above the lower edges of the wings, each rib crosses a line extending perpendicularly from one of the spaces at the lower edge of a wing, so that said rib in effect crosses and interrupts the grooves leading upward from such space or opening, and thus forms a barrier to the upward passage of oil.

It is not absolutely necessary that the ribs and grooves shall extend across the entire width of the wings, 12. It suffices if they extend but a portion of the width from the lower edge. The angle of the ribs may also be varied considerably without destroying their function. In addition to this function of the ribs or corrugations, they greatly strengthen the wings, so that, although made of thin metal, they have the requisite rigidity.

In some cases, I provide the cap, G, with a tongue or lug, 13, (Figs. 1, 2 and 9,) which projects inward from its upper portion and enters a cavity between the adjacent axle-box, A, and wedge, D, so that it serves to hold, or aids in holding, the cap, G, in proper position relative to the journal, B, and box, E. In some axle-boxes, however, no space is provided between the axle-box and wedge, and the said tongue or lug, 13, is of course then dispensed with, the upper edge of the cap proper being bent down and conformed to the shape of the bearing.

As a reliable means for keeping the cap, G, in place by holding it pressed inward snugly against the end of the brass, C, and wedge, D, I construct the curved, steel, plate spring, F, which supports the oil-box, E, with a bifurcated extension, or upward projecting integral portion, (Figs. 1 and 4,) whose free end bears upon the end of the box, E, as shown. The end of the oil-box is thus held in contact with the flat head of the journal-cap, so that dust is excluded, save where the offset is located. The space between the two elastic fingers 14 accommodates the lip, 9, of the oil-box, and also allows convenient introduction of a hook—say the ordinary packing hook employed by trainmen—for the purpose of removing the spring, F, when required for any purpose. The positions of the hook in such operation are shown by dotted lines in Fig. 1—that is to say, there are two holes, 15, (Fig. 4,) formed in the spring, the rear one being for use in case the extension, 14, should by any accident be broken off.

When a car is running curves, the oil inevitably gravitates to the inner end of one of the two boxes, E, of each axle and since such end of the boxes is cut out to accommodate the journal, B, the oil is liable to overflow when the car lurches. To prevent this result, I interpose a baffle-plate, K, which is constructed either in the form shown in Figs. 1 and 2, or in that shown in Fig. 10. It is made from a thin metal plate struck up into the form shown—that is to say, it has a vertical portion, 16, which is cut out to fit the journal, E, and extends up on each side of the latter, while another portion, 17, extends forward and upward at an inclination of say forty-five degrees. It will be perceived that the inclined portion, 17, meets and opposes the first dash of the oil toward the adjacent end of the box, E, so that it but slowly reaches the vertical portion, 16, which, being extended higher, forms a yet more effectual barrier to escape. Thus, little or no oil can escape even when running curves on an uneven track.

As shown in Fig. 3, the sides of the inclined portion are cut away sufficiently to allow the oil that may pass over it to flow back. In Figs. 1 and 2, this inclined portion is shown provided with an extension or spring tongue, 18, which bends downward and is curved upward at its free end; but, in Fig. 10, this extension is absent. The function of the tongue, 18, is to prevent the frame, H, and rollers, 1, being displaced when the box, E, is being inserted in the axle-box, A, since they then tend to slide toward the inner end of the box. In case the baffle plate, is constructed without a tongue, as shown in Fig. 10, a fixed stop, 18, (see Fig. 11,) of any suitable construction, is attached to the bottom of the box, E, at the point where the end of the tongue, 18, is upturned in Fig. 1.

It will be noted that the vertical portion, 16, of the baffle-plate, K, is provided with a series of slits in the edge next the journal, B. These are to render the said portion, 16, more elastic, so that it may bend down easily and without danger of cracking or breaking by contact with the journal, B, when the box, E, is being inserted in the axle-box.

It is obvious, that while the baffle-plate is shown provided with but one bend, it may have two or even more, and that in such case

there would be a corresponding number of inclined portions like that marked, 17.

The aggregate weight of the sheet metal oil-box, E, the skeleton rocker frame, H, and the concave rollers, 1, is practically a minimum, and the spring, F, therefore suffices to hold the rollers in easy contact with the axle-journal, B, even when passing over the most uneven road-bed. The oil is thus applied to the journal with desirable uniformity, and with minimum waste.

Having thus described my invention, I claim—

1. In a journal lubricator, the combination, with the axle-journal, and journal cap having a flat head, of the sheet-metal oil-box, whose outer end incloses and is in contact with the head of the cap, save at the middle, where it is provided with a tapered offset, or exterior projection, formed of a struck-up portion of the box, which extends vertically downward from the upper edge of the latter, as and for the purposes specified.

2. In a journal lubricator, the combination, with the oil-box and a baffle plate, arranged in the bottom of the latter, of the scraper-holding bracket, attached to the end wall of the oil-box, above the bottom of the same, and projecting over the baffle plate, as shown and described.

3. The improved scraper-holding bracket, for use in connection with the journal and lubricant holder, the same consisting of a metal bar provided with sockets for receiving and holding elastic scraper blocks, and having its end portions bent or curved to one side and perforated, as shown and described.

4. For use in an oil box of a lubricator of this class, the H-shaped, skeleton rocker frame, for supporting the oil take-up rollers, the same being composed of parallel side bars having stationary polygonal bearings for the roller axles, and a transverse connection between said bars, which connection is provided with a socket for reception of a pivot, as shown and described.

5. In a lubricator of the class indicated, the combination with the oil-box and journal, of the pivoted H-shaped rocker frame, whose side bars are provided with polygonal notches, or bearings, cylindrical axles having their ends shaped to fit said bearings, and rollers that are free to rotate on such fixed axles, and whose hubs are of less aggregate length than the space between the side bars of said rocker frame, to allow endwise motion of the rollers, as and for the purpose specified.

6. In a journal lubricator of the class indicated, the combination with the oil-box, of the H-shaped rocker frame, having side bars constructed as shown, that is to say, the said side bars having broad downward extensions on each side of the center, and the oil-take-up rollers supported at the ends of said bars, their lower portions extending downward into close proximity to the bottom of the box, whereby the side bars and rollers subserve the function of baffle plates, as specified.

7. In a journal lubricator, the combination with the axle journal and oil-box, having a pivot bearing projecting from its bottom, of the roller-carrying rocker frame having broadened side bars provided with a vertical groove as shown, and a central connecting bar having a continuation of such groove, as and for the purpose specified.

8. In a journal lubricator the combination with the axle-box, journal, oil-box, and the journal-cap, arranged in the latter, of a spring supporting the said oil-box and having an upturned end which bears upon the oil-box, substantially as shown and described.

9. In a journal lubricator, the combination with the axle-box, journal, journal cap, and oil-box, having a hollow offset, or lip, projecting from its front end, of the plate spring having its front end upturned and bifurcated, as shown and described.

10. In a journal lubricator, the combination with the oil-box, of the independent, detachable baffle plate, K, formed of a spring plate projecting forward from the rear lower portion of the oil-box and upward toward the journal, as shown and described.

11. In a journal lubricator, the oil-box, having a baffle plate which is attached to its inner end and provided with a vertical portion which is adapted to embrace the lower portion of the journal, and having a series of slits in the edge next the journal, as shown and described.

12. In a journal lubricator, the combination with the detachable, roller-carrying frame, pivoted on the floor of the oil-box, of the upwardly-projecting baffle plate which is secured to the rear of the oil-box and provided with a downwardly- and forwardly-projecting tongue, whose free extremity is contiguous to the middle of the side of said frame, to serve as a stop, as shown and described.

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