(Model.)

2 Sheets—Sheet 1.

J. S. PATTEN.

CAR AXLE BOX LUBRICATOR.

No. 559,787. Patented May 5, 1896.

Fig. 1.

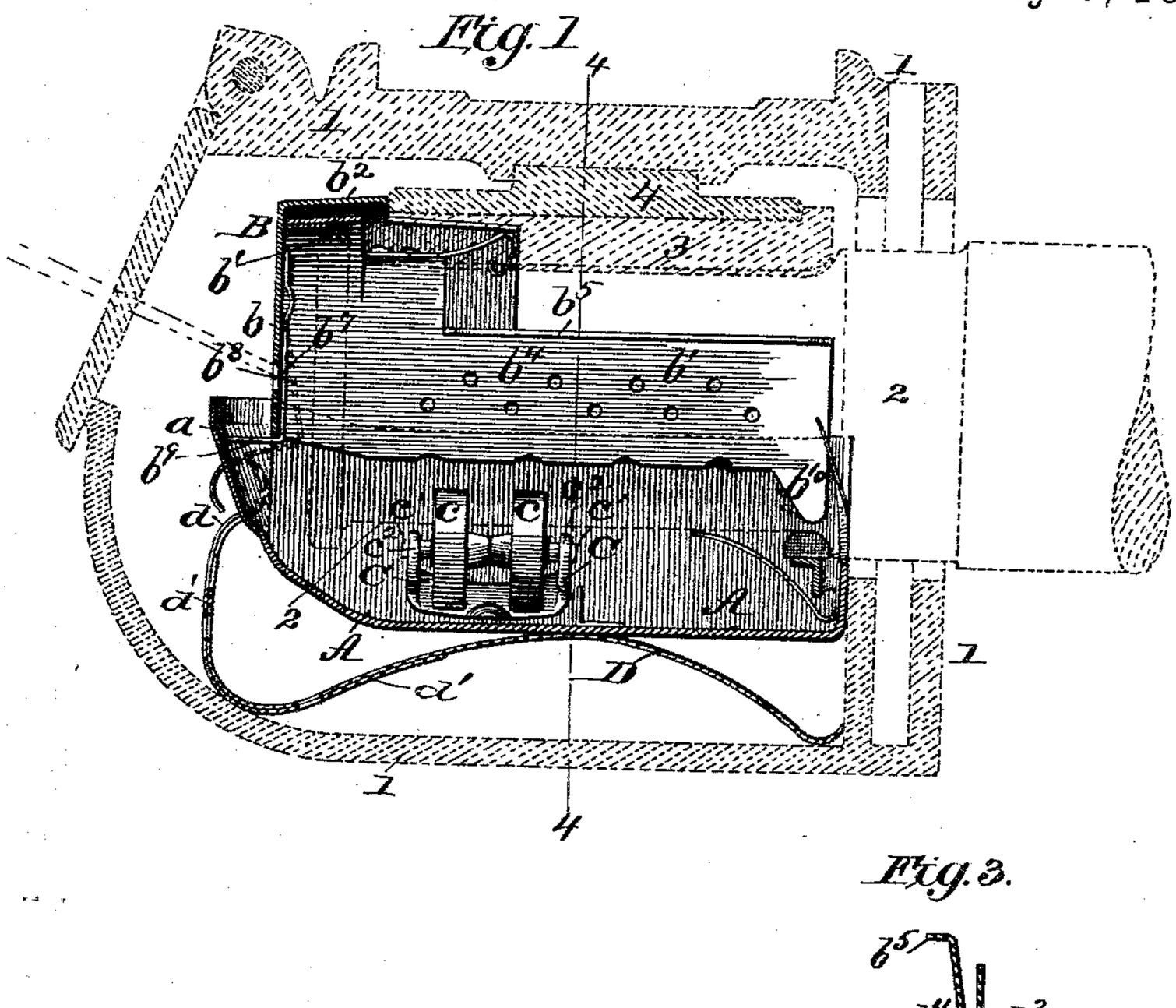


Fig. 2.

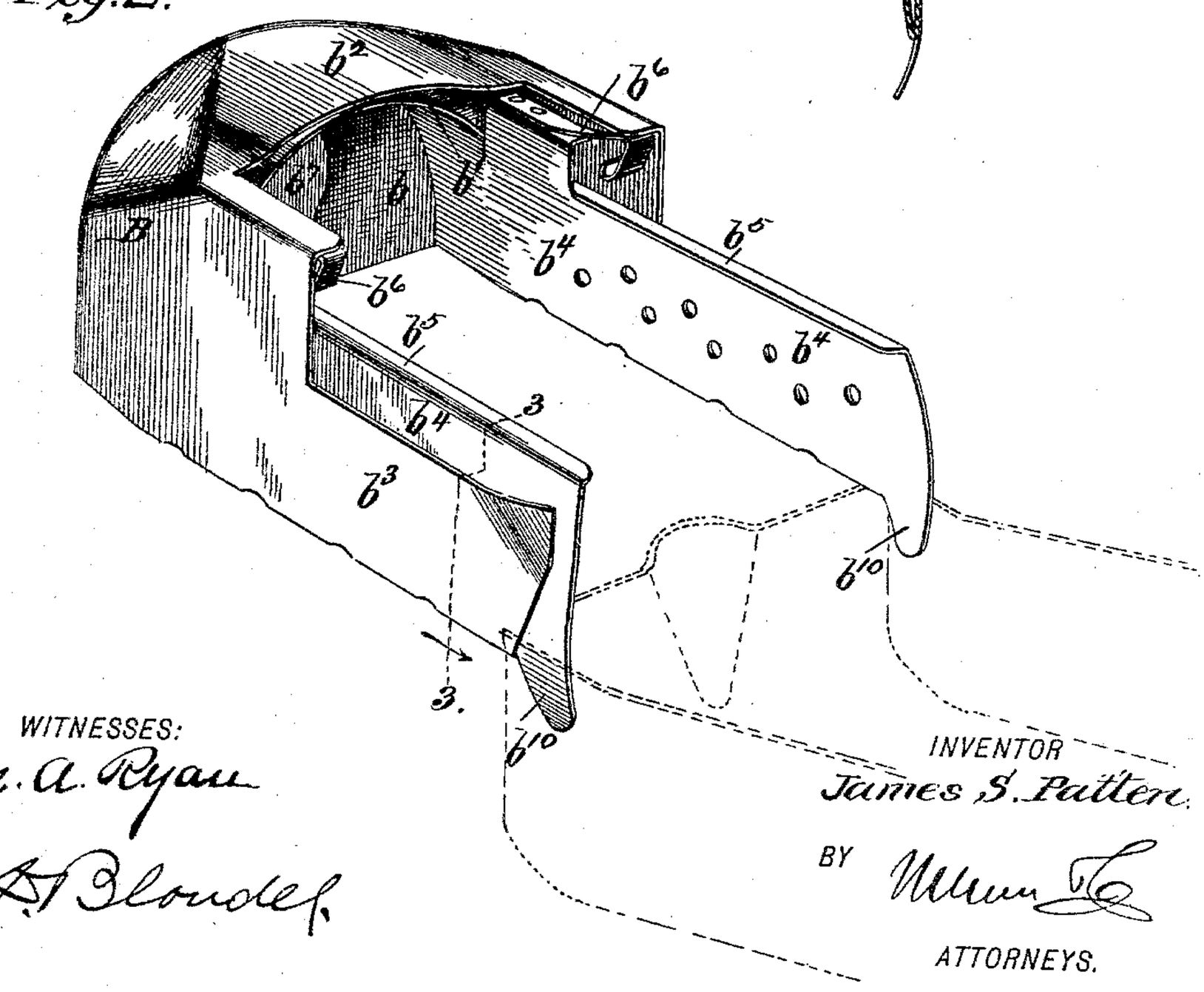
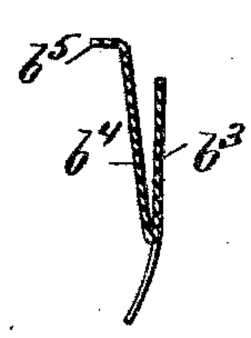


Fig. 3.



WITNESSES:

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W. A. Blondel.

INVENTOR

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BY Munn & Co

ATTORNEYS.

(Model.) 2 Sheets—Sheet 2.

J. S. PATTEN.

CAR AXLE BOX LUBRICATOR.

No. 559,787. Patented May 5, 1896.

Fig. 4.

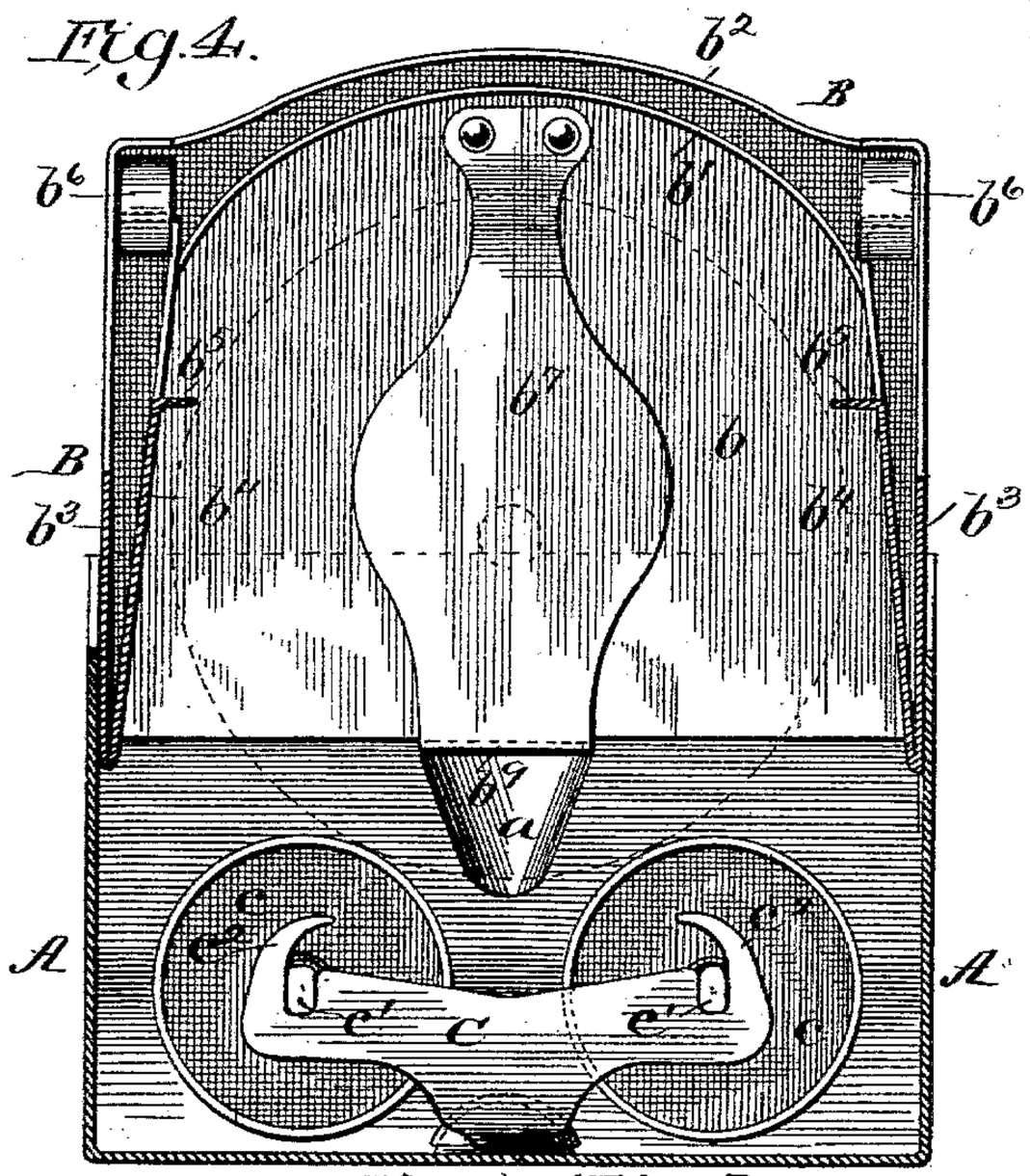


Fig. 6.

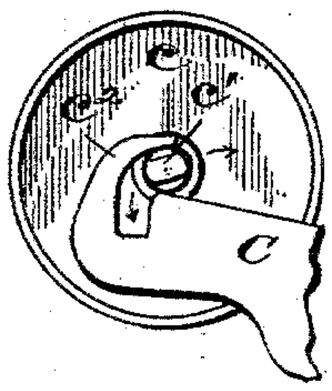


Fig. 5.

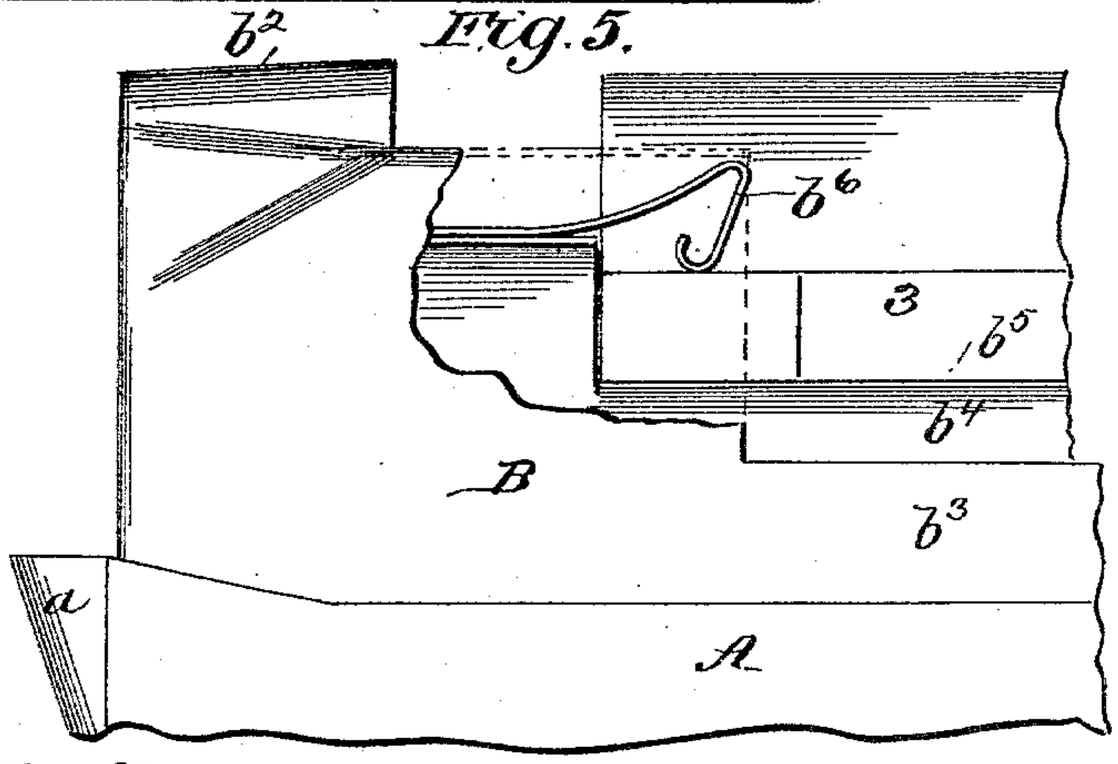
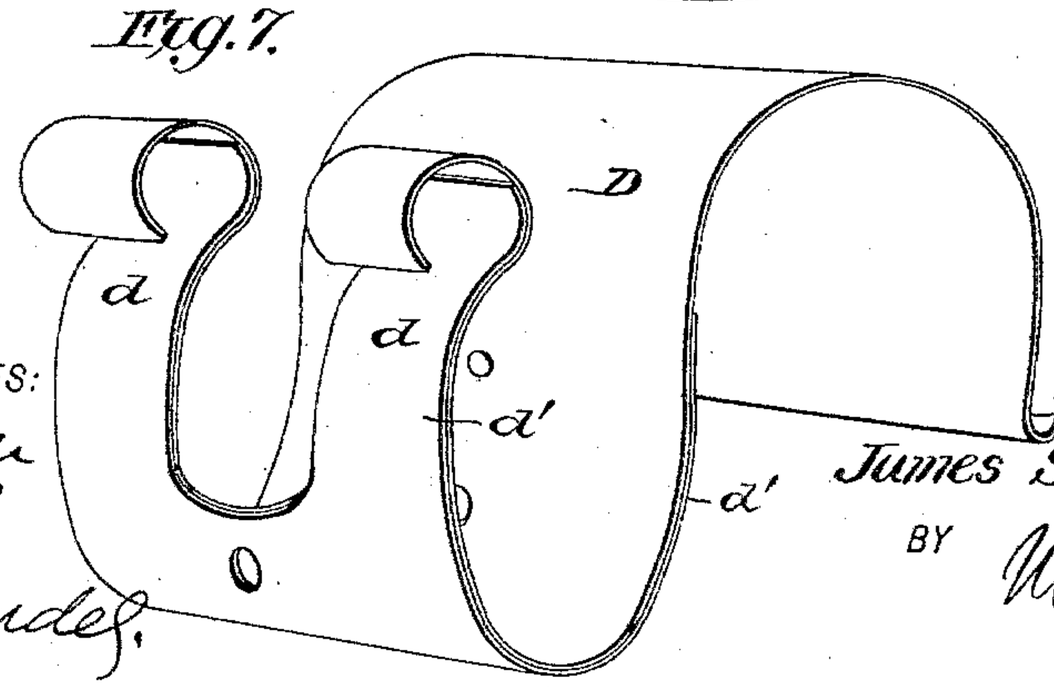


Fig. 7.



WITNESSES:

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES S. PATTEN, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE PATTEN SELF-OILING AXLE AND JOURNAL COMPANY OF BALTIMORE CITY, OF SAME PLACE.

CAR-AXLE-BOX LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 559,787, dated May 5, 1896.

Application filed October 24, 1894. Serial No. 526,848. (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 obtained two Letters Patent and filed an application for others for various important improvements in the class of car-axle lubricators which are distinguished by oil-take-up rollers arranged to work in contact with the axle-journals. In the course of further practical test of my lubricators on cars in actual service I have devised and successfully employed certain novel features which contribute materially to the perfection of the invention. Said features constitute the improvements hereinafter described and claimed.

The improvements relate, chiefly, to the construction of the "journal-cap" employed in connection with the lubricant-receptacle or oil-box, and subordinately to the construction of the pivoted frame carrying the oil-take-up rollers, and the spring which supports the lubricant-holder in the car-axle box.

In the accompanying drawings, two sheets, Figure 1 is a central longitudinal section of my improved lubricator arranged in a car-axle box of a well-known construction, which, together with the axle-journal, is shown in dotted lines for the sake of more clearly distinguishing my invention. Fig. 2 is a perspective view of the journal-cap detached, the oil-box being shown in dotted lines to illustrate a feature and operation hereinafter described. Fig. 3 is a cross-section on line 3 3 of Fig. 2. Fig. 4 is an enlarged vertical cross-section of my lubricator on line 4 4 of Fig. 1. Fig. 5 is a detail view illustrating the relative arrangement of the spring-supports of the journal-cap with "brass" or journal-bearings. Fig. 6 is a detail side view of a portion of the roller-carrying frame, illustrating the manner of inserting and removing the roller-axles and rollers. Fig. 7 is a perspective view of the **S**-shaped plate-spring which supports the oil-box.

The axle-box 1, axle-journal 2, brass 3, and "wedge" 4 (shown by dotted lines) are constructed in a well-known manner. The lubricant-holder or oil-box A is preferably constructed of galvanized sheet-iron and provided with a vertical tapered hollow offset or lip *a* at its front end, as shown and described in my application, Serial No. 505,270, before referred to.

The parts embodying my present invention—to wit, the journal-cap B, the pivoted frame C, carrying the oil-take-up rollers *c*, and the **S**-spring D, which supports the oil-box A—have the same general arrangement relative to each other and to the numbered parts 1 to 4 as shown and described in my aforesaid application. I will now describe in detail the improvements in the said journal-cap B, roller-carrying frame C, and spring D in the order they are here named.

The position of the cap B is shown in Figs. 1 to 4, the hood or cap proper covering the upper portion of the outer end of the axle-journal 2 and the wings extending alongside the latter and the lower edge of the entire cap lying within the upper edge of the oil-box A. In this instance the top and sides of the cap B and the extensions or wings *b'* are made double and otherwise changed in construction, as I will proceed to detail. The end portion of the hood or cap proper, *b*, (see Fig. 2,) is a single plate, but the other portions of the cap, as well as the wings, are formed of two plates or walls which are separated by a narrow space. In the case of the hood the inner plate *b'* of the top portion extends to and abuts the end of the brass 3, while the outer one b^2 projects farther and abuts the wedge 4. This construction—to wit, two walls separated from each other—is essential to prevent escape of oil. The plates or walls b^3 b^4, Figs. 2, 3, and 4, constituting the wings, are not arranged parallel, but inclined outward from the lower edge upward, as best shown in Figs. 3 and 4, so that the wings are practically wedge-shaped in cross-section. The inner plate or wall b^4 is extended higher than the outer one b^3 and its upper edge bent inward, thus forming a horizontal flange b^5, which lies in as close proximity as practicable to the upper portion of the journal B, Fig. 4, without being in contact with it. The chief function of this flange is to prevent oil being thrown outward; but

in the exigencies of severe service some portion may pass over it into the V-shaped trough formed by the two walls b^3 b^4, and to allow its return into the oil-box A the inner wall b^4 is provided with a series of holes, Fig. 2. The walls of each wing are left free or not united at the free ends of the latter, in order to further facilitate return of oil into the oil-box. It will be noted from inspection of Fig. 4 that the space between the walls of the hood is continuous or one with the spaces between the walls b^3 b^4 of the wings, so that any oil that may find its way into the first-named space will pass down into the wings, and thus back into the oil-box.

The cap B is provided with yielding or elastic supports in the forms of two plate-springs b^6, which are arranged horizontally near the top and on opposite sides of the hood or cap proper, being riveted to lateral flanges, Fig. 4, of the inner plate or wall of the hood. Thus the said springs are parallel to the wings and their free ends project in the same direction as the latter, and being also bent downward and inclined backward for the double purpose of forming bearing-contact points and to enable the springs to easily ride or slide over the outer edge of the brass 3 when the cap is being put in place on the journal 2.

When the cap B is in place, the bent ends of the springs b^6 rest upon the lateral projections or lugs of the brass 3 (see Fig. 5) and the flanges b^5 of the wings abut the under side of the same. Thus the springs support the cap so that the flanges b^5 are held at all times in firm contact with the lateral portions of the brass 3 and the cap as a whole is kept practically maintained in fixed relation to the journal and the oil-box. This result is aided by the before-described abutment of the top walls b' b^2 of the hood with the brass 3 and wedge 4, as shown in Fig. 1.

I provide the journal-cap B with a combined oil-guard and dust-excluder b^7, (see Figs. 1 and 4,) which is a right-angular spring-plate riveted at its upper end to the upper portions of the end of the hood or cap proper, on the inner side thereof, and extending downward to the lower edge of the same. The body of the plate covers the hole b^8 in the end of the cap, in which a hook is inserted for withdrawing the journal-cap from the axle-box, and thus serves to prevent escape of oil or entrance of dust at that point. The lower end b^9 of the plate projects forward and is rounded to adapt it to fit in the hollow offset or lip a, so that it also serves to prevent escape of oil and admission of dust through said lip.

When it is desired to inspect the oil-box to determine whether a fresh supply of oil is required, also when it is desired to introduce such supply, a tool or rod is inserted through the hole b^8 to push back the guard b^7, as shown by dotted lines, Fig. 1.

Difficulty has been encountered in inserting the journal-cap B into the oil-box A by reason of the liability of the ends of the wings catching over or passing outside the side edges of the box. I have remedied the difficulty by providing the wings with downward and inwardly-curved extensions b^{10}, Fig. 2, at the lower corners of their free extremities. Thus, when the cap is to be inserted, the said extensions easily enter the box, as shown by dotted lines in Fig. 2, and by sliding along the sides of the oil-box they guide the cap to place.

I preferably form the body of the cap—that is to say, all portions of it save the end of the hood—of one piece, the same being cut out, as a blank of proper configuration, from a sheet of metal by means of a stamping-die, such blank being then bent or doubled at the lower edge of the wings to form the inner and outer walls before described; but I may in some instances form the body of the cap of two or more pieces, and in such case they will be riveted together or otherwise permanently united at the lower edges of the wings.

As before, the roller-carrying frame C is set on a pivot fixed on the bottom of the oil-box A, which is likewise provided with a stop to arrest said frame at the right point when being introduced in the box after the latter has been placed in an axle-box in use. In such insertion the roller-frame requires to be tilted at a considerable angle to enable it and the attached rollers to pass between the outer end of the box and the journal, and in consequence the roller-axles c' tend to drop out of their bearings, whereby both axles and rollers fall into the oil-box, thus causing extra labor as well as delay and annoyance in recovering them. This result is effectually prevented by providing the ends of the parallel side bars of the roller-frame with curved extensions c^2, which are in the nature of claws or fingers that project inward over the rectangular notches in which the roller-axles c' are normally held, and thus serve as guards which prevent the axles becoming accidentally dislodged. The axles, with rollers held loosely thereon, may, however, be easily detached, when desired, (see Fig. 6,) by raising their ends vertically out of the notches and then turning them horizontally. This operation is obviously reversed in order to insert the axles in their bearings.

In practically carrying out this part of my invention the notches or sockets are made vertical, and the guard-fingers extend inward completely across them; but their points or extremities are separated from the adjacent edges of the side bars by a space which exceeds the narrowest diameter of the axle-journals, so that the latter may be easily slid into and out of the sockets; yet their accidental escape, when the frame is tilted or even completely inverted, is effectually prevented.

The roller-frame C is preferably constructed of cast malleable iron, and in order to enable it to "draw" from the mold the prongs or fingers are cast straight and parallel, so that they

stand perpendicular to the axes of the side bars of the frame and require to be subsequently bent or curved manually into the form shown.

In order that the improvement in the form of the S-shaped plate-spring D, supporting the oil-box A and the contained rollers and roller-frame, may be better understood, I will preface description of the same with the statement that in applying my lubricator to a car-axle box in use its parts are introduced in the following order: First the oil-box A is inserted, then the roller-carrying frame C and rollers *c*, next the spring D, and, lastly, the journal-cap B. In this operation the spring D requires to be somewhat compressed or flattened, which, owing to its strength, requires considerable force, and in such operation the bifurcated end portion *d* of the spring is bent outward from the convoluted body of the same by reason of pressure against face of the journal-cap B, over which said end of the spring must slide downward into place, Fig. 1. The friction between the journal-cap and bifurcations of the spring is such that considerable difficulty is experienced in forcing the spring down into place. I have found by experiment that this can be mainly overcome by constructing the terminals of the spring-bifurcations *d* in cylindrical form, Figs. 1 and 5—that is to say, the forked ends *d* of the spring (which are for such purpose made of greater length than heretofore) are bent or curved circularly outward, and thus their inner sides present smooth rounded surfaces which slide over the face of the journal 2 with comparatively little friction, and hence enable the spring D to be inserted into the axle-box with comparatively little exertion. The cylindrical ends of the springs D also subserve another function in that they inclose or cover and also protect the upturned ends of a bifurcated reinforcing-spring and wear-plate *d'*. Such part *d'* is a thin spring-plate applied to the under side and front end of the spring, being riveted at a point above the lower bend of the latter. It thus covers and protects such lower bend and prevents wear of the same, which would otherwise result from friction with the rough bottom of the axle-box. The bifurcations of the reinforced part *d'* are held in due position as well as protected by the inclosing cylindrical terminals *d* of the spring D.

What I claim is—

1. In a journal-lubricator, the improved journal-cap, having a hood whose top portion is formed of two separated plates or walls which are adapted to abut the bearing-blocks, substantially as shown and described.

2. In a journal-lubricator, the improved journal-cap, having longitudinal side extensions, or wings, constructed with double walls which are separated at the top, and provided with passages for return of oil into the oil-box, substantially as shown and described.

3. In a journal-lubricator, the improved journal-cap, having longitudinal side extensions or wings, which are trough-like in form and are open at the top, the inner wall of the same having lateral openings, substantially as shown and described.

4. In a journal-lubricator, the improved journal-cap, having longitudinal side extensions, or wings, which are each provided with an inwardly-projecting flange, as shown and described.

5. In a journal-lubricator, the improved journal-cap, preferably formed of sheet metal, and having a double-walled body and double-walled side extensions, or wings, the space between the walls of the body communicating with those in the said wings, as shown and described.

6. In a journal-lubricator, the improved journal-cap, having its wings provided with pendent inwardly-curved extensions, to serve as guides in placing the cap in position in the oil-box, substantially as shown and described.

7. In a journal-lubricator, the improved journal-cap, provided with spring-supports arranged with their free bearing ends over the side wings, but separated from the latter by a space adapted to receive a supporting-piece, substantially as shown and described.

8. In a journal-lubricator, the combination with the journal-cap, having a hole in the end or face of its hood portion, of a spring-plate attached to the inner side of said face, as shown and described, whereby said plate is adapted to serve as an oil-guard and dust-excluder, as specified.

9. In a journal-lubricator, the combination with the journal-cap, and the oil-box having a hollow offset, or lip, at its front end, of the spring guard-plate attached to the end of the cap and its lower end normally projecting into the said offset, substantially as shown and described.

10. In a journal-lubricator, the combination with the oil-box, having a hollow offset at its front end, and the journal-cap having a hole in the end of its hood, as specified, of a spring-plate, attached to hood on the inner side and having its lower end bent outward and shaped to fit in said offset, substantially as shown and described, whereby the plate subserves the functions hereinbefore specified.

11. In a journal-lubricator, the combination with an oil-box, journal, and a bearing-block applied to the latter, of the journal-cap, having its hood constructed of two walls separated by a narrow space, substantially as shown and described.

12. In a journal-lubricator, the combination with an oil-box, journal, and brass, or bearing-block, therefor, of the journal-cap, having spring-supports adapted to bear upon such block, and with abutments or shoulders below said supports, which bear upward against the under side of the block, substantially as shown and described.

13. In a journal-lubricator, the combination with a journal and brass or bearing-block thereon, of a journal-cap and springs attached to the sides of the hood portion of the latter, and having their free ends inclined backward, whereby they are adapted to ride over the edge of said block as specified.

14. In a journal-lubricator, the combination with an oil-box and journal, of a journal-cap having longitudinal side extensions, or wings, which are double-walled, or trough-like, the walls being separated at the top as shown and described.

15. In a journal-lubricator, the combination with an oil-box and journal, of a journal-cap having longitudinal trough-like side extensions, or wings, having lateral oil-passages, the walls of said wings being separated at the top by a narrow space, and the inner walls provided with a flange projecting inward into close proximity to the journal as shown and described.

16. In a journal-lubricator, the combination with the oil-box having an open top and parallel sides, of a journal-cap having side wings provided with pendent extensions at their inner ends, substantially as shown and described.

17. In a journal-lubricator of the class hereinbefore indicated, the roller-carrying frame having vertical notches or sockets in the ends of its side bars, and rigid guard-fingers which project inwardly entirely across the upper side of such sockets, and which are permanently removed or separated, for their whole length, from the opposite side of the socket and bar by a distance greater than the narrowest diameter of the axle-journals, as shown and described, whereby the latter may be easily and quickly inserted or removed, manually, but will not be displaced when the roller-frame is tilted, as set forth.

18. In a journal-lubricator, the **S**-shaped plate-spring having the extremities of its front ends constructed in cylindrical form as shown and described for the purpose specified.

19. In a journal-lubricator, the spring for supporting the oil-box, the same consisting of the **S**-shaped spring-plate, and the curved reinforce and wear-plate secured exteriorly to and conforming with the lower bend and front end of said spring, as shown and described.

20. In a journal-lubricator, the combination with the axle-box, axle-journal and oil-box, of the **S**-shaped spring having the extremity of its front end bent or curved forward into cylindrical form, and the combined reinforce and wear-plate, applied to and conforming with the lower bend and front portion of said spring, and its upper extremity projecting into and being thus covered by the cylindrical portions, as shown and described.

JAMES S. PATTEN.

Witnesses:
MORTON SCHAEFFER,
THOS. C. BAILEY.