







# UNITED STATES PATENT OFFICE.

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## JOURNAL-BEARING FOR CAR-AXLES.

SPECIFICATION forming part of Letters Patent No. 414,301, dated November 5, 1889.

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*To all whom it may concern:*

Be it known that I, WILLIAM OTIS DUNBAR, a citizen of the United States, and a resident of Altoona, county of Blair, and State of Pennsylvania, have invented certain new and useful Improvements in Journal-Bearings for Car-Axles, of which the following is a specification.

My invention relates to that class of journal-bearings for car and other axles which are provided on their sides with shelves extending along the same, whereby the lubricant raised from a receptacle below, or otherwise, is conducted back and distributed along the journal, as shown, for instance, in United States Letters Patent No. 392,593, granted to me November 13, 1888, to which reference may be had. With journal-boxes of this class, as ordinarily constructed, the lubricant is raised from a suitable containing-receptacle in the bottom or lower portion of the box by a ring, band, or chain passing over the journal or a pulley thereon, and is deposited either upon the journal proper or upon a flange or flanges formed on or secured to the same. From the surface or surfaces upon which it is thus deposited it is usually removed by scrapers depending from projections extending outward from the journal-bearing, and is then allowed to flow upon the shelves and thence to the journal. In all cases where these scrapers and shelves have heretofore been employed, however, the former, instead of serving as a means for removing the lubricant and conducting it directly to the latter, have merely acted as obstructions to prevent its passage on the moving surface or surfaces upon which it was deposited by the ring, band, or chain, causing it to well up or accumulate before one or the other of them, depending upon the direction in which the axle was rotated, until a pool was formed, when a portion of it so accumulated fell or passed upon the shelf adjacent thereto, and flowed along its upper surface to the point where discharged upon the journal, the scrapers and shelves being disconnected, except in so far as they both formed parts of and were embodied in the same journal-bearing. My present invention differs from these, as it does from all others with which I am acquainted, in that the scrapers, which are provided with sharp

edges, extend inward toward each other above and tangent, or nearly so, preferably, to the surface or surfaces from which the lubricant is to be removed, and are directly connected to their respective shelves, whereby the lubricant removed by them is caused to flow directly to the shelves, and a more positive distribution of the same along the journal is thereby insured.

The general features of my invention having been thus alluded to, its particular construction and mode of operation will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a side view of a car-axle journal, a ring for raising the lubricant, and a journal-bearing with my invention applied thereto, the ring being shown in section; Fig. 2, a plan view of the same, with the ring for raising the lubricant omitted; Fig. 3, an end view of the journal-bearing detached; Fig. 4, a side view of a car-axle journal, a ring for raising the lubricant, and a journal-bearing of a slightly-modified construction, the ring being shown in section; Fig. 5, a plan view of the parts shown in Fig. 4, with the ring for raising the lubricant omitted; and Fig. 6, an end elevation of the journal-bearing shown in the last two mentioned figures, detached.

In all the figures like letters are employed to designate corresponding parts.

A indicates a journal of a car or other axle, having formed on or secured to its outer end a pulley *a*, upon which is mounted a ring B, by means of which the lubricant is raised from a containing-receptacle below and deposited upon a surface or surfaces from which it is to be removed and conveyed to the point where required. In the drawings these surfaces are shown as disposed upon the peripheries of flanges formed on or secured to the outer end of the journal, a single surface *a'* being employed in Figs. 1 and 2, and a plurality of such surfaces *a'* *a*<sup>2</sup> being made use of in Figs. 4 and 5; but it is to be understood that these flanges are not essential, and may be dispensed with, if desired, the surface or surfaces in which event being formed upon the journal itself.

C indicates the journal-bearing, which in its general construction is or may be of any



ordinary or preferred form, and, with the journal A, upon which it is mounted, will in practice be preferably arranged in a suitable journal-box, (not shown,) all as is common with this class of devices. Secured to or formed integrally with this bearing are shelves  $c\ c'$ , by means of which the lubricant is distributed along the journal. In the preferred form of construction these shelves extend along the lower outer edges of the bearing from points midway the rear and middle of the same to its front, and project from the latter outward over the ring B to the outer extremity of the journal A, being respectively provided on the inner sides of their projecting portions with scrapers  $c^2\ c^3$ , through which the lubricant is removed from the surface or surfaces upon which deposited by the ring and delivered thereto. As shown in the drawings, these scrapers are constructed with the outer edges made sharp or chisel-pointed, and are arranged with such edges extending inward toward each other above and tangent to the surface or surfaces in connection with which they are to operate, their upper sides being provided with channels or guideways  $c^4$ , which, commencing near their outer ends, extend backward therefrom and are continued along a portion of the upper sides of their respective shelves. The scrapers  $c^2\ c^3$  being thus arranged on opposite sides of a line passing vertically through the axis of the journal, with the under sides of their outer ends in close contact with the lubricant-supporting surfaces in connection with which they operate, it follows that if a single surface for the lubricant were employed, and the edges of the scrapers were each made of the same width as such surface, the scraper opposite that toward which the journal for the time being is rotated would serve as an obstruction to the movement of the lubricant on its carrying-surface, causing such lubricant to accumulate beneath its under side, and thereby prevent any of it passing to the other scraper, which, in consequence would be rendered practically useless. To obviate this defect and at the same time permit of this operation of the scraper being availed of to aid in the lubrication of the journal, I either make the edges of the scrapers of a width somewhat less than the width of the surface in connection with which they operate when a single surface is employed, as shown in Figs. 1 and 2, or else make use of two surfaces and so dispose the scrapers that one of them shall come opposite to one of such surfaces and the other opposite to the other surface, as illustrated in Figs. 4 and 5. By these constructions, as will be seen, the passage of the lubricant to the scraper on that side of the bearing toward which the journal is rotated is insured, even with the form in which but a single surface is employed, as the lubricant after passing the edges of the obstructing scraper, in addition to its back-and-forth movement with the journal in its bearing, spreads in-

ward upon its supporting-surface, and a portion of it is thereby brought in front of the other scraper, which removes it therefrom and causes it to pass to the journal through the channel or guideway  $c^4$ , while the lubricant removed by the scraper on the opposite side of the bearing, and accumulated beneath its underside, flows down along the under surface of the shelf which supports such scraper and is also distributed along the journal, the portions of the shelves in front of the center of the bearing being inclined downward from their outer ends to facilitate this operation. The channels or guideways  $c^4$ , through which the lubricant is carried back along the upper sides of the shelves, preferably extends from the outer ends of the latter to points slightly in advance of a medial line passing transversely through the bearing, the upper sides of the rear portions of these shelves being formed as plane surfaces, upon which the lubricant is discharged from the channels or guideways and from which it flows downward over their edges upon the journal, grooves  $b\ b'$  being employed to insure a more easy flow and distribution of the same, if desired. In addition to these grooves the distribution of the lubricant along the journal may in some instances be aided by beveling the under side of the shelves from their outer edges downward toward the journal, as shown, for instance, at  $b^2$  in Figs. 1 and 3. As the parts are thus constructed and arranged the lubrication of the journal throughout its entire length is insured, no matter in which direction it may be rotated, the lubricant collected from its supporting-surface by the under side of the scraper on the side of the bearing opposite that toward which the journal may be rotated being principally distributed along that portion of the journal located in front of the center of the bearing, while that removed by the other scraper will be carried back along the shelf to that part of the journal which is situated at or near the center of the bearing and in rear thereof. The extension of the shelves  $c\ c'$  out over the ring B to the end of the journal, while preventing the ring from being thrown from its pulley, also serves, through the instrumentality of the channels or guideways upon their upper sides, to catch any lubricant which may be thrown upward in that portion of the box and return it to the journal with that removed from the surface or surfaces on the journal by the scrapers  $c^2\ c^3$ .

From the foregoing it will be seen that I produce a journal-bearing which is not only simple in construction, but which insures a more abundant supply of lubricant to the journal, in whichever direction rotated, than has been possible with the bearings heretofore in use.

In the above I have described the best means contemplated by me for carrying my invention into practice; but I wish it distinctly understood that I do not limit myself



strictly thereto, as it is obvious that I may modify the same in various ways without departing from the spirit thereof—as, for instance, instead of employing a ring, band, or chain for supplying lubricant to the surface or surfaces from which it is removed by the scrapers, I may dispense with such devices and substitute in place thereof any other equivalent means for performing that service.

10. Having thus described my invention and one way in which it is or may be carried into effect, what I claim as new, and desire to secure by Letters Patent of the United States, is—

15 1. A journal-bearing provided with a channel or guideway for conducting the lubricant along the same, and a scraper with which such channel or guideway is directly connected, substantially as described.

20 2. A journal-bearing provided with a plurality of channels or guideways for conducting the lubricant along the same, and with a plurality of scrapers with which such channels or guideways are directly connected, substantially as described.

25 3. A journal-bearing provided with a shelf extending along each of its lower outer edges, and with a scraper for co-operating with each of such shelves, having a channel or guideway formed in its upper side and extending back and along its respective shelf, substantially as described.

30 4. The combination, with a journal provided with a lubricant-supporting surface, of a bearing for such journal provided with a channel or guideway, and a scraper for co-operating with such lubricant-supporting surface, connected directly with said channel or guideway, whereby the lubricant is removed from its supporting-surface and conducted along the bearing for distribution upon the journal, substantially as described.

35 5. The combination, with a journal provided with a lubricant-supporting surface or surfaces and means for supplying lubricant thereto, of a bearing for such journal provided with a plurality of channels or guideways extending longitudinally of the same, and with a plurality of scrapers for co-operation with such surface or surfaces and directly connected to the channels or guideways, substantially as described.

40 6. The combination, with a journal provided with a lubricant-supporting surface or surfaces and means for supplying lubricant thereto, of a bearing for such journal provided with a shelf along the lower outer edge of each of its sides, and with a scraper for each of such shelves arranged to co-operate with the lubricant-supporting surface or surfaces upon the journal, and provided on its upper side with a channel or guideway ex-

tending back along the same and along the shelf supporting such scraper, substantially as described.

65 7. The combination, with a journal provided with a lubricant-supporting surface or surfaces and means for supplying lubricant thereto, of a bearing for said journal provided with a channel or guideway extending along each of its sides, and with a scraper having a sharp or chisel edge connected directly to each of said channels or guideways and arranged to extend inward above and tangent to the surface in connection with which it operates, substantially as described.

80 8. The combination, with a journal A, provided with a lubricant-supporting surface or surfaces and means for supplying lubricant thereto, of a bearing C for such journal provided with shelves  $c\ c'$ , the scrapers  $c^2\ c^3$ , projecting inward toward each other above and tangent to the surface or surfaces in connection with which they operate, and the channels or guideways  $c^4$ , extending back along both the upper sides of the scrapers and the shelves to which the respective scrapers are secured, substantially as described.

85 9. The combination, with a journal A, provided with a lubricant-supporting surface or surfaces and means for supplying lubricant thereto, of a bearing C for such journal, provided with shelves  $c\ c'$ , scrapers  $c^2\ c^3$ , and the channels or guideways  $c^4$ , the outer portions of the shelves being inclined downward from their outer ends toward their centers, substantially as described.

90 10. A journal-bearing for car and other axles, constructed with the shelves  $c\ c'$ , the scrapers  $c^2\ c^3$ , and the channels or guideways  $c^4$ , the outer portions of the shelves being inclined downward from their outer ends toward their centers, and their rear portions being formed as plane surfaces upon which the lubricant is discharged from the channels or guideways and from which it passes to the journal, substantially as described.

95 11. A journal-bearing for car and other axles, constructed with the shelves  $c\ c'$ , the scrapers  $c^2\ c^3$ , and the channels or guideways  $c^4$ , the outer portions of the shelves being inclined downward from their outer ends toward their centers, and their rear portion being constructed as plane surfaces with the grooves  $b\ b'$  formed therein, and their under sides inclined downward from their outer edges toward the surface which rests upon the journal, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of July, 1889.

WILLIAM OTIS DUNBAR.

Witnesses:

CHAS. A. GREER,

WM. M. WITHEROW.