(No Model.)

W. L. HALDY.

SELF LUBRICATING JOURNAL BEARING.

No. 412,251. Patented Oct. 8, 1889.

Fig. 1

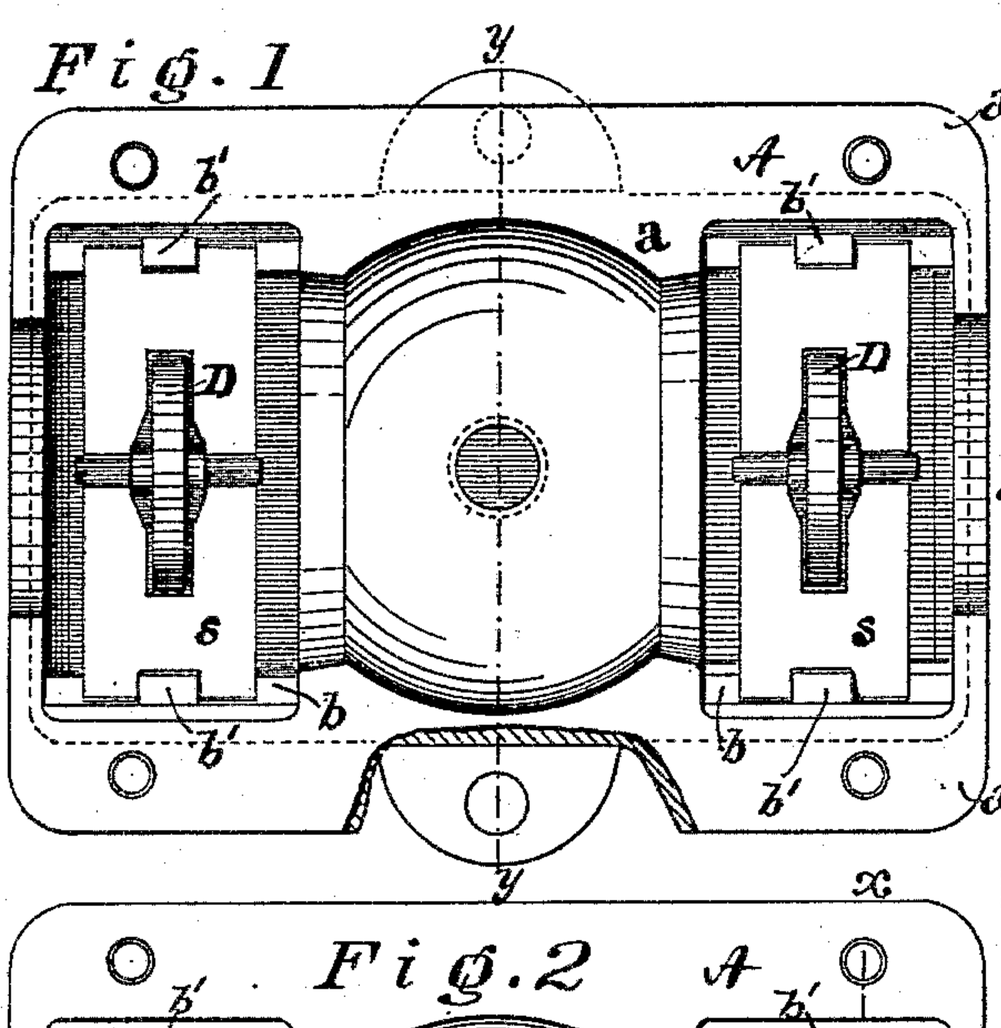


Fig. 4

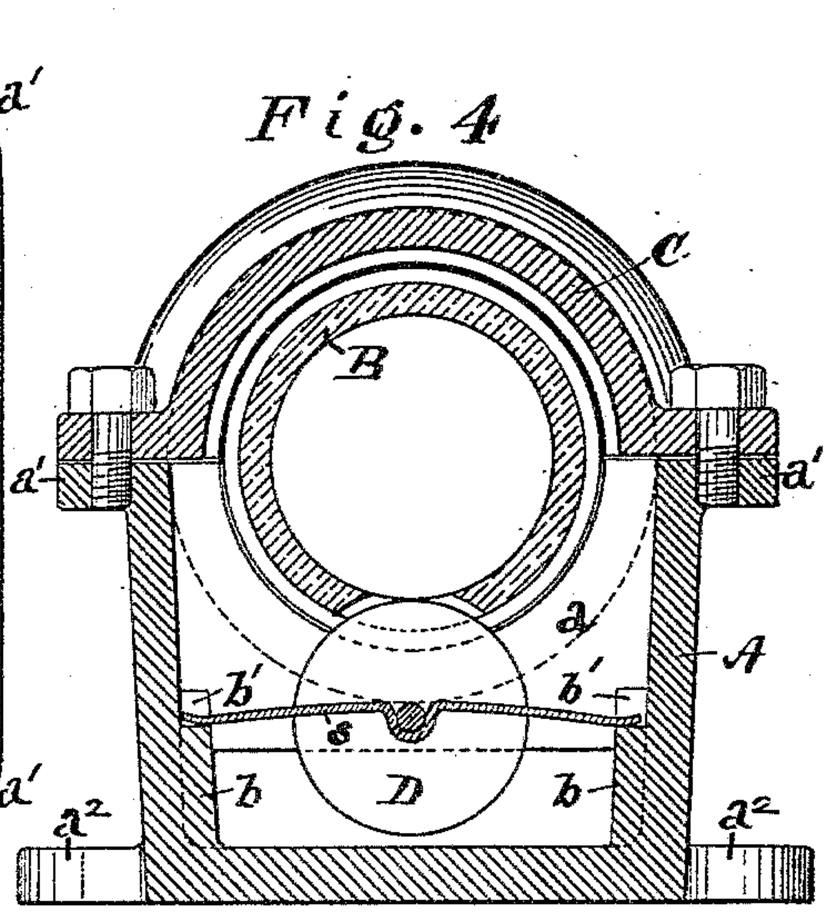


Fig. 2

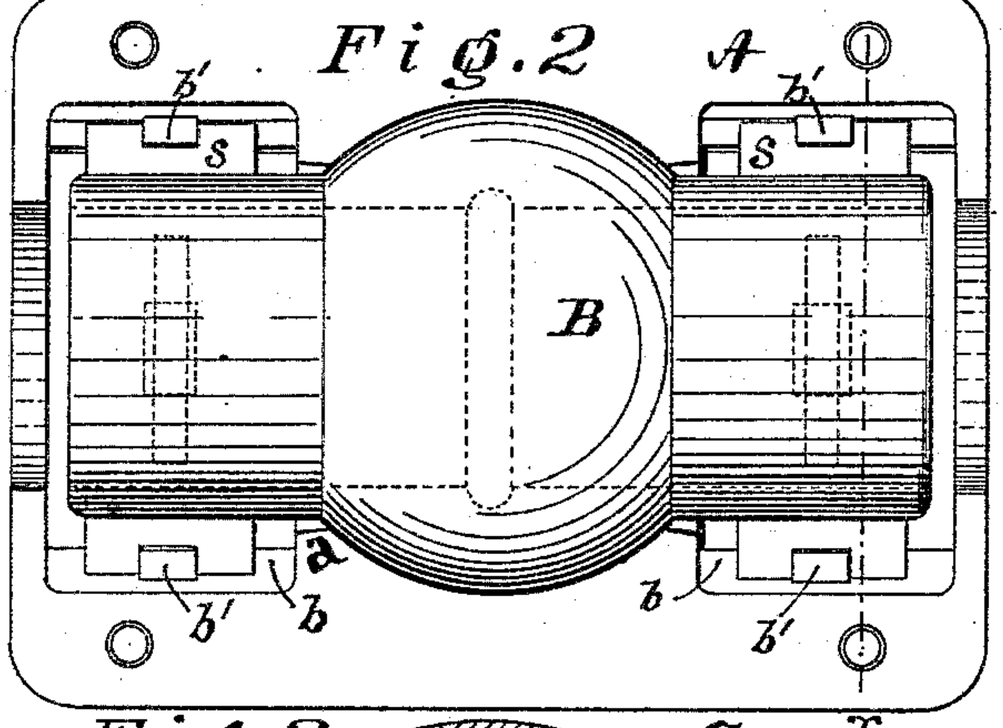


Fig. 5.

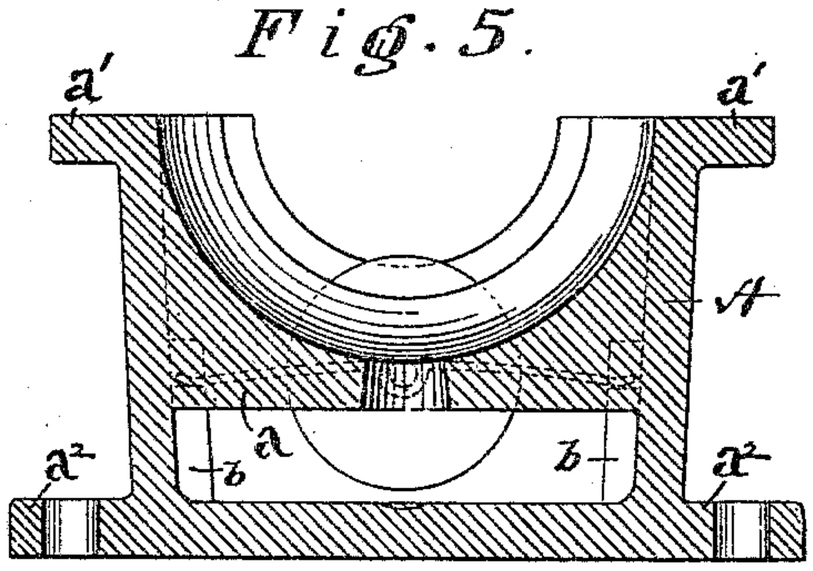


Fig. 3

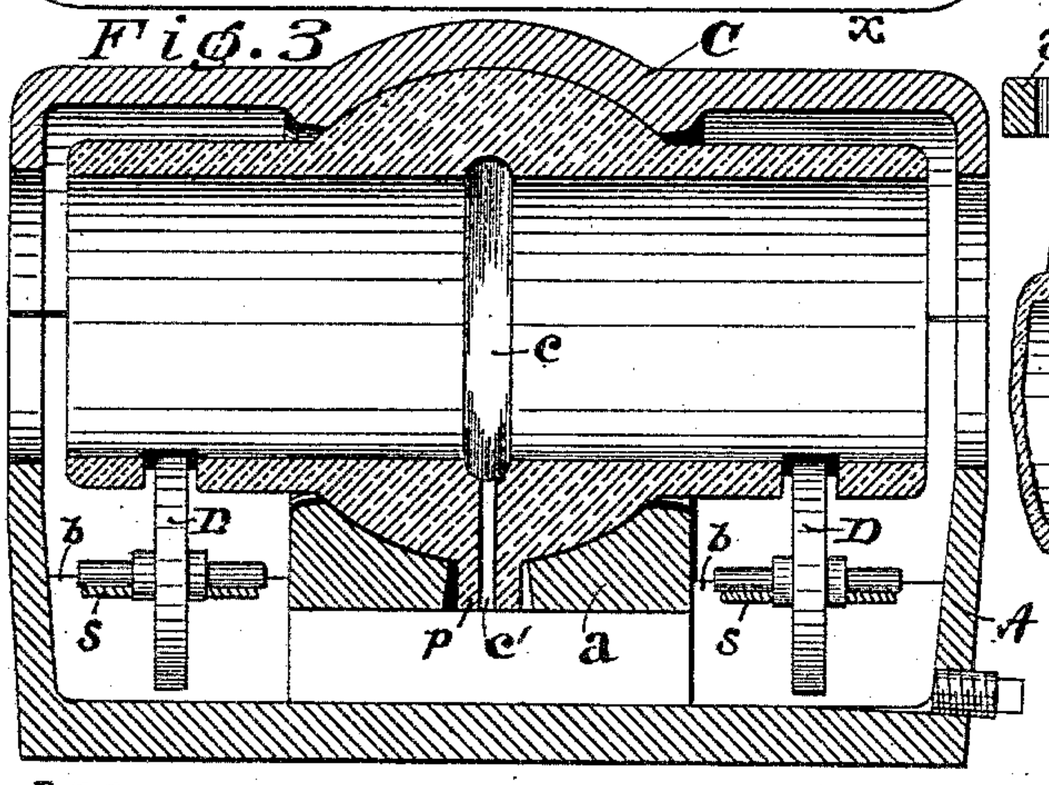
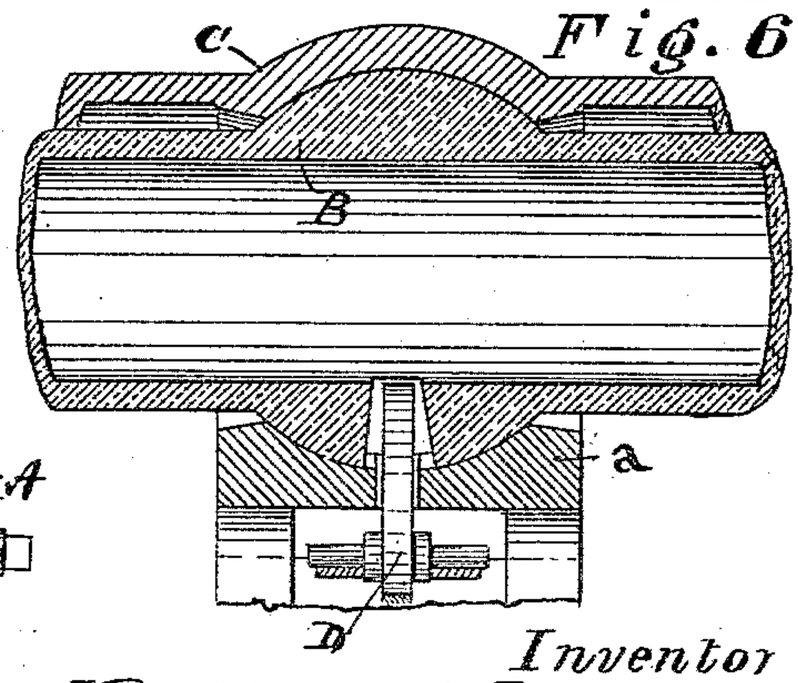


Fig. 6



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UNITED STATES PATENT OFFICE.

WALTER L. HALDY, OF CINCINNATI, OHIO.

SELF-LUBRICATING JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 412,251, dated October 8, 1889.

Application filed July 1, 1889. Serial No. 316,131. (No model.)

To all whom it may concern:

Be it known that I, WALTER L. HALDY, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Self-Lubricating Journal-Bearings, of which the following is a specification.

My invention relates to bearings for high-speed shafting, its object being to produce a self-lubricating bearing protected from dust, &c., adapted to carry the journals of high-speed shafts—such as those of electric motors and dynamos, blowers, &c.—without heating.

To this end it consists in a journal-bearing embodying a journal-box provided with an oil-reservoir, a sleeve detachably held therein and embracing the journal, and one or more oil-carrying wheels mounted on springs and rotating in the reservoir through apertures of the sleeve against the shaft-journal; also, in the construction and arrangement of the spring wheel-supports, whereby they serve as oil-deflectors to prevent excessive feed of oil, all constructed and arranged, as hereinafter set forth, to produce a flow and circulation of oil to and over the journal.

Mechanism embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the lower part of the box with cover and sleeve removed, exhibiting the oil-wheels and their springs in position; Fig. 2, a plan view of the same with a journal-sleeve in place; Fig. 3, a vertical axial section of the entire bearing complete; Fig. 4, a cross-section of the bearing complete, taken on line $x\,x$ of Fig. 2; Fig. 5, a central cross-section taken in the line $y\,y$ of Fig. 1; and Fig. 6, a vertical axial section of a bearing in which but one oil-wheel is used, arranged centrally.

Referring now to the drawings, the bearing as constructed embodying my invention consists of three principal elements—first, the boxing, including the hollow pillow-block and cap; second, the sleeve which embraces the journal, and, third, the oil wheel or wheels and their holding-springs. These it will be convenient to describe separately.

First. The boxing. The style of bearing herein shown is a "ball-and-socket" bearing, allowing for deflectively-aligned shafting. The pillow-block A is cast as a rectangular box or trough for containing oil, with a central cross-bridge a, having a spherical depression, in which rests the central spherical boss or enlargement of the sleeve B, presently to be described, and the cap C is correspondingly formed to cover the central boss of the sleeve, the pillow-block and its cap thus forming a socket in which the sleeve B is held and has proper oscillation to accommodate defective alignment of the shaft. At the bottom of the socket-depression is a hole to admit a projecting pin p, carried upon the enlargement of the sleeve to prevent rotation. When two oil-wheels are used, as in the first five figures of the drawings, abutments b are formed at the inner sides of the trough A, near each end, to receive the ends of the wheel-supporting springs, presently to be described, these abutments being formed with a central tongue b', projecting upward to aid in holding the springs in place. The box A is provided with an upper flange a', for the proper attachment of the cap C, and a bottom flange or base a^2, by which it may be bolted upon its resting-support. The cap C is of the usual construction, and will require no further description.

Second. The sleeve B is a hollow cylinder somewhat shorter than the boxing A C, and formed with a spherical enlargement, already referred to, and with a steadying-pin p, projecting radially at the under side. Through the shell of the sleeve, near each end, is a rectangular opening at the under side to admit the oil-wheels D D to enter and rest against the shaft within. These apertures are sufficiently large to allow for the described oscillation of the sleeve. I also prefer to form a circumferential groove c centrally in the inner periphery of the sleeve, communicating with the radial hole c', drilled from the exterior through the pin p, although this is not essential.

Third. The oil-wheels D D are disks pivotally mounted upon flat springs $s\,s$, which rest upon the abutments $b\,b$, and are notched to fit around the tongues b' to prevent lateral displacement. The apertures through which the wheels play in the springs $s\,s$ are somewhat closely formed to the contour of the wheels, in order that the spring-plates may deflect any excess of oil which otherwise would be carried to the shaft.

In the form of the device thus described

the oil adhering to the wheels is carried to the shaft, and by adhesive action of the sliding surfaces is distributed over the journal longitudinally outward and inward. In passing outwardly it overflows the ends of the sleeve B and drops back into the trough, or is thrown radially outward against the interior of the cap A′ and flows back to the trough, being prevented from passing farther along the shaft by a collar or the usual enlargement or offset upon the shaft. In passing inwardly the central groove *c* serves to receive the opposing streams of oil, which then flow back into the trough through the radial aperture *c′*, where, however, the groove and perforation are omitted, a certain slight crowding action of the oil takes place, which compels the excess to pass outward to the ends of the sleeve, while keeping the central parts thoroughly lubricated. These descriptions apply, however, to the use of two such wheels. One of them (preferably the outer one) may be omitted and the other alone used. In case but one wheel is used, however, I prefer to place it at the center of the sleeve, and to this end form a suitable aperture through the bridge *a* and through the central enlargement of the sleeve, all as shown in Fig. 6. The action in such case is substantially as already described.

Although I have shown my invention herein as applied to a sleeve having a ball-and-socket union with the pillow-block bearing, yet it will be obvious that it is equally applicable to a bearing-sleeve having no enlargement, and such I deem within the spirit of my invention.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. A journal-bearing embodying, essentially, three elements, in combination, viz: first, a hollow pedestal or supporting-box formed with an oil-reservoir beneath the journal-opening; second, an independent journal-sleeve held in said journal-opening by a connection preventing rotation, but permitting oscillations caused by inaccurate alignment of the shaft, and, third, one or more oil-wheels carried upon yielding supports in the oil-reservoir and bearing through a suitable opening or openings of the sleeve against the journal, substantially as set forth.

2. In a journal-bearing, the combination of a journal-box having an oil-reservoir beneath the axis of the journal, an independent detachable journal-sleeve provided with a spherical enlargement at mid-length, adapted to rest adjustably in a corresponding enlargement of the box, and provided with one or more openings at the under side, and one or more oil-wheels mounted on yielding supports in the oil-reservoir and bearing against the journal through the opening or openings of the sleeve, substantially as set forth.

3. In a journal-bearing, the combination of a journal-box having an oil-reservoir beneath the axis of the journal, an independent detachable journal-sleeve enlarged spherically at mid-length to rest adjustably in a corresponding enlargement of the boxing, and with a projecting pin upon the under side of such sleeve enlargement projecting into a corresponding hole in the bottom of the socket-depression of the boxing, and provided with one or more openings at the under side, and one or more oil-wheels mounted on yielding supports in the oil-reservoir and bearing against the journal through the opening or openings of the sleeve, substantially as set forth.

4. In a journal-bearing, the combination of a journal-box having an oil-chamber beneath the axis of the journal, an independent detachable journal-sleeve constructed with a circumferential groove in the inner wall thereof, and a passage leading therefrom through the sleeve into the oil-reservoir below, and two oil-wheels mounted on yielding supports in the oil-reservoir and bearing through suitable openings in the sleeve upon the journal—one at each side of the said groove and passage—substantially as and for the purpose set forth.

5. In a journal-bearing, the combination of a journal-box having an oil-reservoir beneath the journal-axis, an independent journal-sleeve enlarged spherically at mid-length and resting in a correspondingly-enlarged socket-bearing formed in the boxing, said sleeve being provided with a pin at the under side of its spherical enlargement, engaging in a corresponding aperture in the bottom of the socket-bearing to prevent rotation thereof, a circumferential groove in the inner wall of the sleeve with an outlet therefrom leading through said pin into the oil-reservoir below, and two oil-wheels mounted on yielding supports—one at each side of said groove—and bearing against the journal through suitable apertures in the sleeve, substantially as set forth.

6. In a journal-bearing, the combination of a journal-box having an oil-reservoir beneath the axis of the journal, an independent detachable journal-sleeve enlarged spherically at mid-length to rest in a corresponding enlargement of the box, and one or more oil-wheels pivotally mounted in and upon flat spring-plates and revolving in contact with the journal through apertures in said sleeve, said plates having wheel-apertures so conformed to the sectional contour of the wheels as to act as scrapers to remove any excess of oil adhering thereto, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WALTER L. HALDY.

Witnesses:
L. M. HOSEA,
L. ELEANOR HOSEA.