No. 888,101. PATENTED MAY 19, 1908.

G. KÜPFER.

JOURNAL BEARING.

APPLICATION FILED FEB. 7, 1907.

Fig. 1.

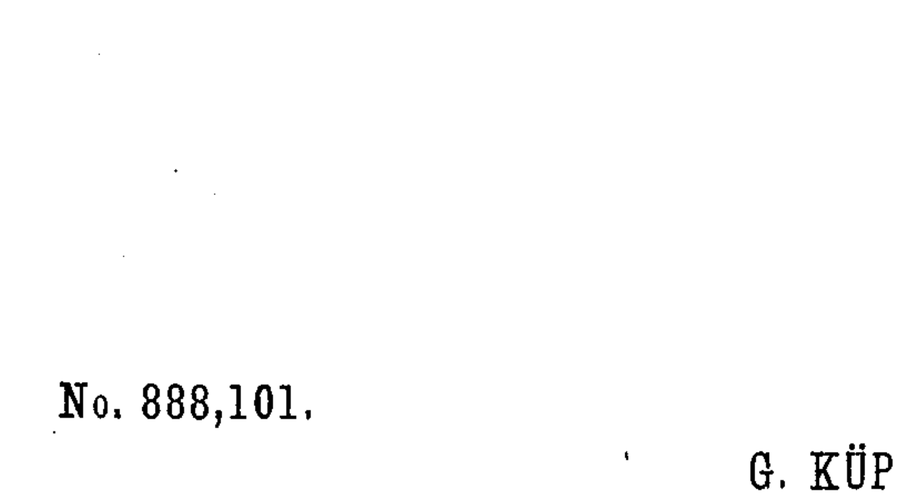


Fig. 2.

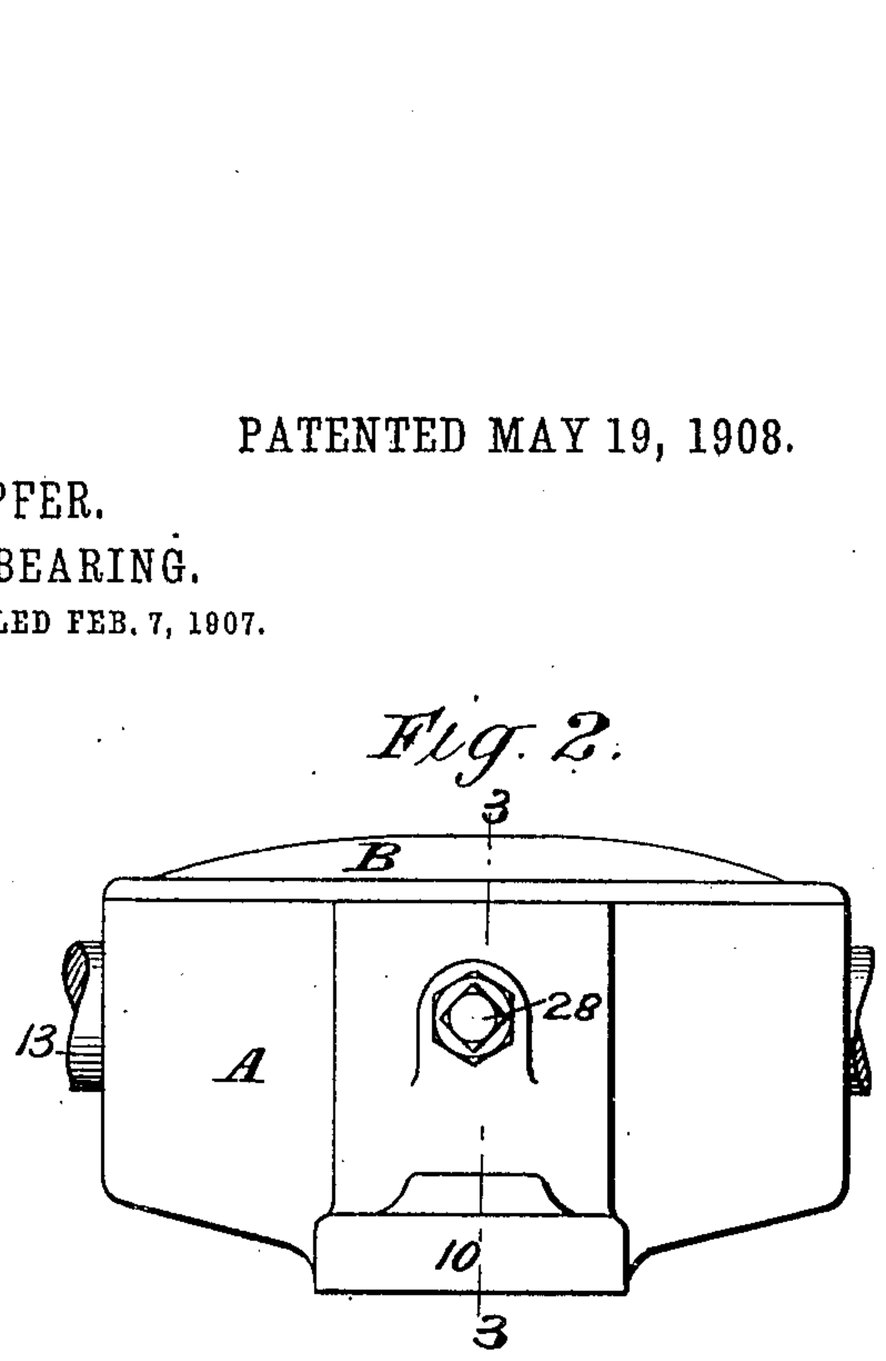


Fig. 3.

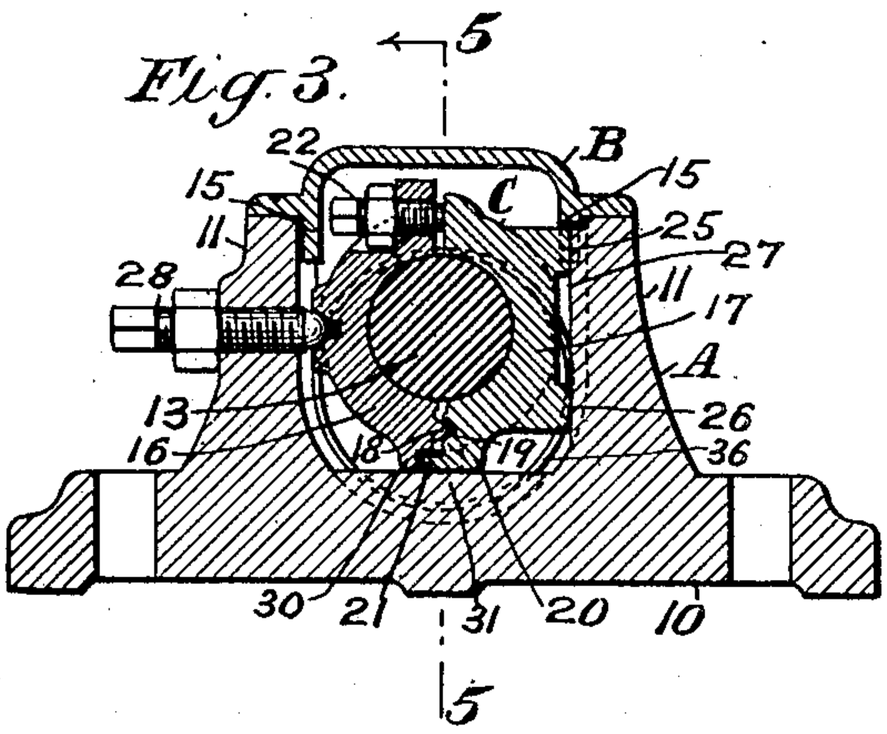


Fig. 4.

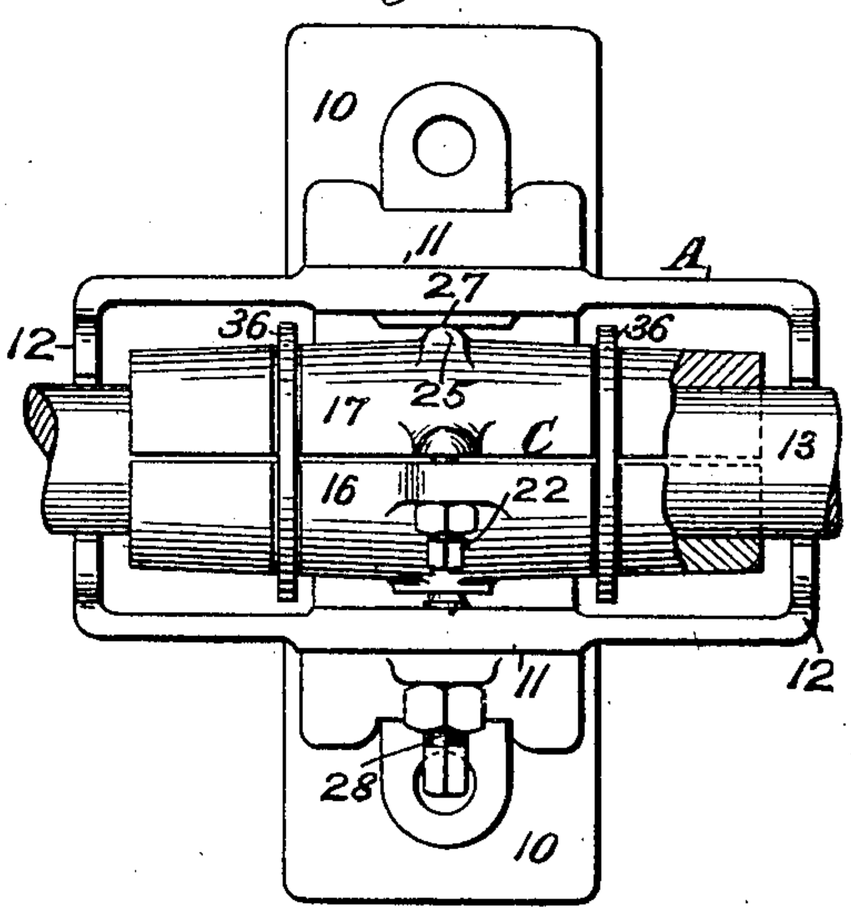


Fig. 5.

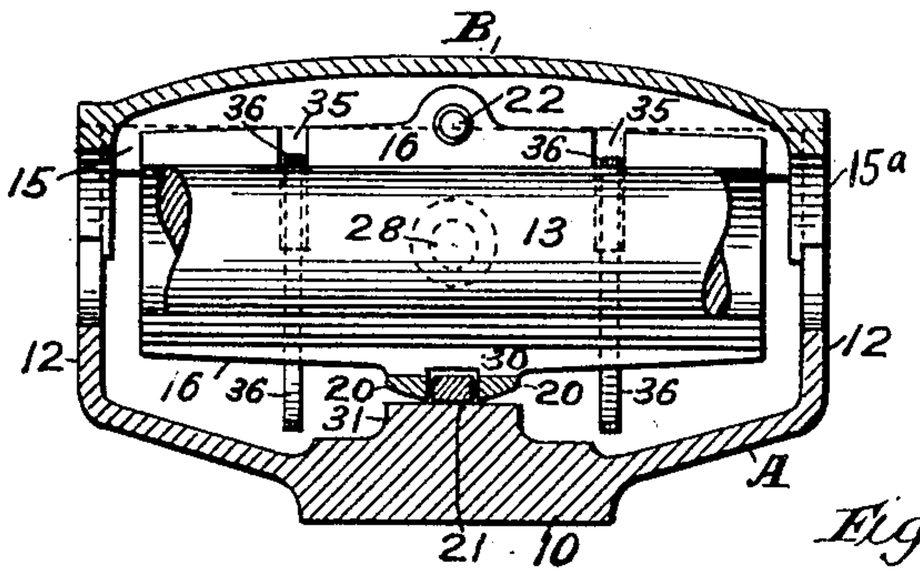


Fig. 6.

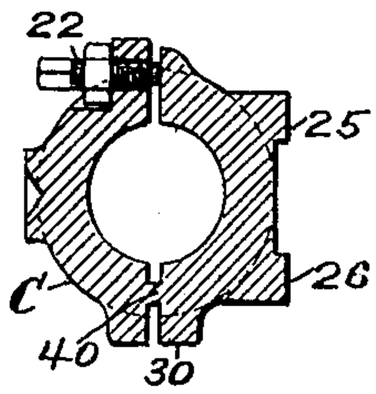
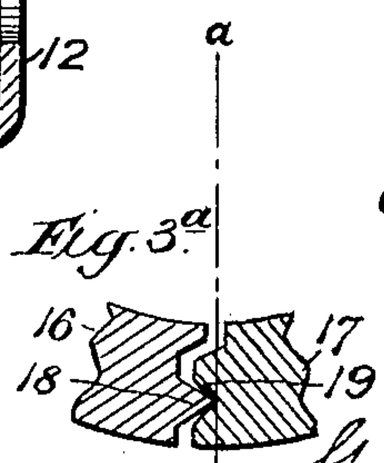


Fig. 3a.



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UNITED STATES PATENT OFFICE.

GUILLERMO KÜPFER, OF SANTIAGO, CHILE.

JOURNAL-BEARING.

No. 888,101. Specification of Letters Patent. Patented May 19, 1908.

Application filed February 7, 1907. Serial No. 356,172.

To all whom it may concern:

Be it known that I, GUILLERMO KÜPFER, a citizen of the Confederation of Switzerland, residing at Santiago, Province of Santiago and Republic of Chile, have invented certain new and useful Improvements in Journal-Bearings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to self adjusting journal bearings, and the invention aims to provide an improved bearing of this class which shall be of simple construction and formed of a comparatively small number of parts of such form as to require but little machine work on the castings of which such parts may be formed, and the parts of which may be readily assembled and adjusted, and to secure generally economy in manufacturing cost and efficiency and durability of the bearings to a high degree.

To these ends the invention consists in various features of construction and arrangement and combination of parts, all as will be hereinafter fully described and specifically pointed out in the claims.

A full understanding of the invention can best be given by a detailed description of a preferred construction embodying the various features thereof, and such a description will now be given in connection with the accompanying drawings showing such a preferred construction.

In said drawings:—Figures 1 and 2 are respectively side and end elevations of the bearing. Fig. 3 is a section on line 3 of Fig. 2. Fig. 3[a] is an enlarged detail sectional view showing a slightly modified form of the rib and groove connection between the parts of the bearing sleeve. Fig. 4 is a plan view of the bearing with the cover removed. Fig. 5 is a section on line 5 of Fig. 3. Fig. 6 is a detail cross sectional view of a modified form of bearing sleeve.

Referring to the drawings, and first to Figs. 1 to 5, A represents the body portion of the bearing box or supporting casing which is formed of a single casting having a base portion 10, upwardly extending sides 11, and ends 12 formed with openings for the shaft 13. The box or casing is provided with a cover B, but the bearing sleeve or bearing proper is supported entirely by the body portion of the box and the cover is provided merely for protection against dirt. The upwardly extending walls of the box are formed with substantially vertical inside faces, and the cover is provided with downwardly extending flanges 15 which lie inside such walls. The downwardly extending ends 15[a] of the cover are formed to fit into correspondingly shaped openings in the ends 12 of the casing, and, aided possibly by the flanges 15, serve to prevent the splashing out of the oil and to prevent the cover from jumping out of place without other fastening means being provided.

The bearing proper is formed by a bearing sleeve C mounted between the sides of the supporting body A. The bearing sleeve is split longitudinally, and is preferably formed of two longitudinal halves 16 and 17. The proper relative position of the two parts of the bearing sleeve is insured and their relative displacement prevented by means of a longitudinal rib 18 on one part which extends into a corresponding groove 19 on the other thereby preventing relative transverse displacement, and interlocking projections 20 and 21 extending from the two parts of the sleeve and by which longitudinal displacement is prevented. The rib 18 and groove 19 may both be of V form as shown in Fig. 3[a] so as to provide a knife edge bearing between the two halves of the sleeve on one side of the shaft, but in order to provide a stronger and more lasting construction, and especially for heavy shafts, the bearing edge of the rib 18 is preferably rounded off as shown in Fig. 3, this form of rib serving the same purpose as the sharp V form of Fig. 3[a] while giving greater resistance to wear and breakage. The pivotal line or axis of the pivotal bearing formed by the rib 18 and groove 19, that is, the bearing edge of the rib in Fig. 3[a], or the axis of curvature of the edge of the rib in Fig. 3, is preferably located in the radial plane of separation of the two parts of the bearing sleeve as indicated by the broken line *a* in Fig. 3[a]. On the other side of the shaft an adjusting means such as the set screw 22 is provided for limiting the approach of the two halves of the sleeve. In cases where a nice adjustment of the bearing sleeve to the shaft is not required, it will not be necessary to provide such set screw or other adjusting means.

The bearing sleeve is secured within the supporting box or casing by means of lugs 25 and 26 on the part 17 of the sleeve arranged vertically one above the other to bear against

a smooth bearing surface 27 on one of the sides 11 of the box, and by a set screw 28 extending through the opposite side 11 of the box and engaging in a conical depression in the part 16 of the sleeve. The sleeve will thus be supported on one side by a bearing which is practically a single point bearing formed to prevent lateral displacement of the engaging parts, and on the other side will be supported by what amounts practically to a line bearing which will prevent the turning of the sleeve while permitting a relative movement between the engaging parts longitudinally of the bearing sleeve, and the term "line bearing" is used in the claims as meaning a bearing having at least two bearing points in a line extending transversely to the axis of the bearing sleeve, so as to prevent the turning of the bearing sleeve. The one point bearing and the line bearing thus constitute a triangular bearing with the one point bearing at the apex of the triangle and the line bearing forming the opposite side or base of the triangle. The arrangement of the lugs 25 and 26 relatively to the set screw 28 should be such that the lugs are in a line extending transversely and preferably at right angles to the axis of the bearing sleeve and intersecting a line extending at right angles to the plane of the surface 27 and through the bearing point of the set screw 28, one lug being above and the other below such point of intersection. Obviously a continuous bearing edge might be provided instead of the two lugs.

If a rounded or hemispherical depression were provided in part 16 of the sleeve for receiving the rounded end of the screw 28 instead of the conical depression as shown, the result would obviously be the same, that is, there would be provided in effect a single point bearing; and also of course the same result would be secured by providing the screw with a pointed conical end to enter a conical depression in the bearing sleeve such as is shown in Fig. 6, but this form of a true single point bearing would not so well stand heavy pressures.

When the set screw has been adjusted to extend into the conical depression of the part 16 of the sleeve and to hold the lugs 25 and 26 against the bearing surface 27, such screw will then determine the position of the sleeve and hold it against bodily movement relatively thereto, while the lugs 25 and 26 by engagement with the bearing surface 27 will prevent any turning movement of the sleeve, and at the same time be free to move on the bearing surface 27 either in the same or opposite horizontal directions, thereby providing for a universal swiveling movement of the bearing sleeve within the box, that is, a swiveling movement vertically or horizontally or in any intermediate direction. The bearing sleeve will thus be free to adjust itself absolutely to the alinement of the shaft.

For supporting the bearing sleeve at the proper height relatively to the set screw 28 when the bearing is being set up or assembled, the parts of the sleeve are provided with supporting lugs 30 adapted to rest on a supporting block or projection 31 formed by a part of the base portion of the box. Such supporting lugs play no part in supporting or securing the sleeve within the box, but are merely for convenience in assembling. As shown, said lugs carry the interlocking projections 20 and 21 and their under surfaces are cut away or rounded off so as to form a curved face, the axis of which is in line with the axis of the screw 28. Such curved face will obviously not interfere with the vertical swiveling movement of the bearing sleeve, and it will not be necessary that the sleeve when supported by the set screw 28 and the lugs 25 and 26 shall be lifted to raise the lugs 30 so far from the supporting block 31 as would be necessary or desirable in order to permit of the desired free adjusting movement of the sleeve if the under surfaces of the lugs 30 were not cut away or rounded off to form such a curved face.

Any suitable means may be provided for securing a proper lubrication of the bearing. As shown, the base portion of the box is formed to act as an oil receptacle and the bearing sleeve is cut away at points 35 to expose the shaft and to receive oil rings 36 which hang from the shaft and extend into the oil contained within the lower part of the box or oil receptacle, such rings rotating with the shaft and acting to carry oil to the upper surface thereof, which oil then becomes distributed over the bearing surface in the usual manner.

Where a two part bearing sleeve is not required or desired, but it is yet desired to provide for adjustment of the sleeve to the shaft, a split sleeve formed of a single piece, as shown in Fig. 6, may be provided. The sleeve as shown in this figure is split on one side and on the other side is cut away to provide a thin connecting portion 40 which will allow the sleeve to be readily adjusted about the shaft by means of the adjusting set screw 22 working against the pressure of the set screw 28.

It will be observed that the bearing sleeve is supported entirely by the body portion A of the box or by parts connected therewith, and that the cover is merely for the purpose of protection from dirt and may be removed to permit the bearing to be inspected while the shaft is running. When the cover is removed, the shaft will be visible for the entire length of the bearing through the opening at the top of the bearing sleeve.

The manner of setting up and adjusting the bearing will be evident from the fore-

going description and from an inspection of the drawings, and the simplicity of such operations, as well as the strength of the construction and accurate self adjustability of the bearing surface to the shaft to meet the most exacting requirements, will be apparent.

While illustrated as embodied in a construction in which the bearing sleeve is arranged with the radial plane of separation of two parts of the sleeve vertical, the sleeve may be arranged otherwise, and it will be understood that the invention is not to be limited to such an arrangement except where so specified in the claims.

What is claimed is:

1. The combination with a bearing sleeve of supporting means therefor comprising a one point bearing on one side thereof formed to prevent lateral displacement of the engaging parts and a line bearing on the opposite side extending transversely to the sleeve axis and intersecting a line extending at right angles to the bearing surface and through the one point bearing.

2. The combination of a bearing box and a bearing sleeve supported within the box by means of a line bearing with one side of the box extending at right angles to the axis of the bearing sleeve and a one-point bearing with the opposite side of the box, one member of the line bearing being a smooth surface and the one-point bearing being formed to prevent lateral displacement of the engaging parts.

3. The combination of a bearing box and a horizontally arranged bearing sleeve formed of two longitudinal halves arranged with their radial planes of separation vertical and supported within the box by means of a vertical line bearing with one side of the box and a one point bearing with the other side of the box, one member of the line bearing being a smooth surface and the one point bearing being formed to prevent lateral displacement of the engaging parts.

4. In a bearing, the combination of a bearing box, a bearing sleeve within the box, a set screw 28 mounted in one side of the box having its end formed to enter a corresponding depression in one side of the sleeve, there being bearing lugs 25 and 26 on the other side of the sleeve, and a supporting surface on the corresponding side of the box against which said lugs bear, substantially as described.

5. A bearing sleeve formed of two longitudinal halves provided one with a longitudinal rib 18 and the other with a longitudinal groove 19 to receive the rib 18 to prevent relative transverse displacement of the parts of the sleeve and with interlocking projections 20 and 21 to prevent relative longitudinal displacement of the parts of the sleeve, substantially as described.

6. A bearing sleeve formed of two longitudinal halves provided one with a longitudinal rib 18 and the other with a corresponding longitudinal groove 19 to receive the rib, the rib and groove forming a pivotal bearing between the halves of the bearing sleeve on the side of the sleeve and being located so that the pivotal axis lies in the radial plane of separation of the two halves of the bearing sleeve, said bearing sleeve being further provided on the opposite side from said pivotal bearing with adjusting means for limiting the approach of said halves of the bearing sleeve toward each other, substantially as described.

7. The combination with a bearing sleeve, of supporting means therefor comprising an adjustable one point bearing on one side thereof formed to prevent lateral displacement of the engaging parts and two separated bearings on the opposite side of the sleeve arranged in a line extending transversely to the sleeve axis, such supporting means forming a triangular bearing for the sleeve.

8. The combination with a bearing box and a bearing sleeve within the box, of supporting means for the sleeve consisting of a triangular bearing having a one point bearing at the apex of the triangle, and the opposite side or base of the triangle formed by bearing surfaces permitting movement between the bearing sleeve and the box in the direction longitudinally of the bearing sleeve.

9. The combination with a bearing box and a bearing sleeve within the box, of supporting means for the sleeve consisting of a triangular bearing having a one point bearing at the apex of the triangle formed to prevent the apex from being displaced laterally but permit the sleeve to turn freely on the apex, and the opposite side or base of the triangle formed by bearing surfaces permitting the bearing sleeve to turn on the apex bearing, and to swing on the apex bearing so that the portion of the bearing sleeve adjacent to the base of the triangle shall move in the direction longitudinally of the bearing sleeve.

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

GUILLERMO KÜPFER.

Witnesses:

FARLES MEUMAUSSL,

AMADEE AYODN.

Corrections in Letters Patent No. 888,101.

It is hereby certified that in Letters Patent No. 888,101, granted May 19, 1908, upon the application of Guillermo Küpfer, of Santiago, Chile, for an improvement in "Journal-Bearings," errors appear in the printed specification requiring correction, as follows: In line 60, page 1, after the word "walls" the words *and serve to prevent the splashing out of the oil* should be inserted, and in lines 64–65, same page, the words "to prevent the splashing out of the oil and" should be stricken out; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of June, A. D., 1908.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.