

(No Model.)

S. J. HOWELL.

BEARING FOR SHAFTS, SPINDLES, &c.

No. 298,207.

Patented May 6, 1884.

Fig. 1.

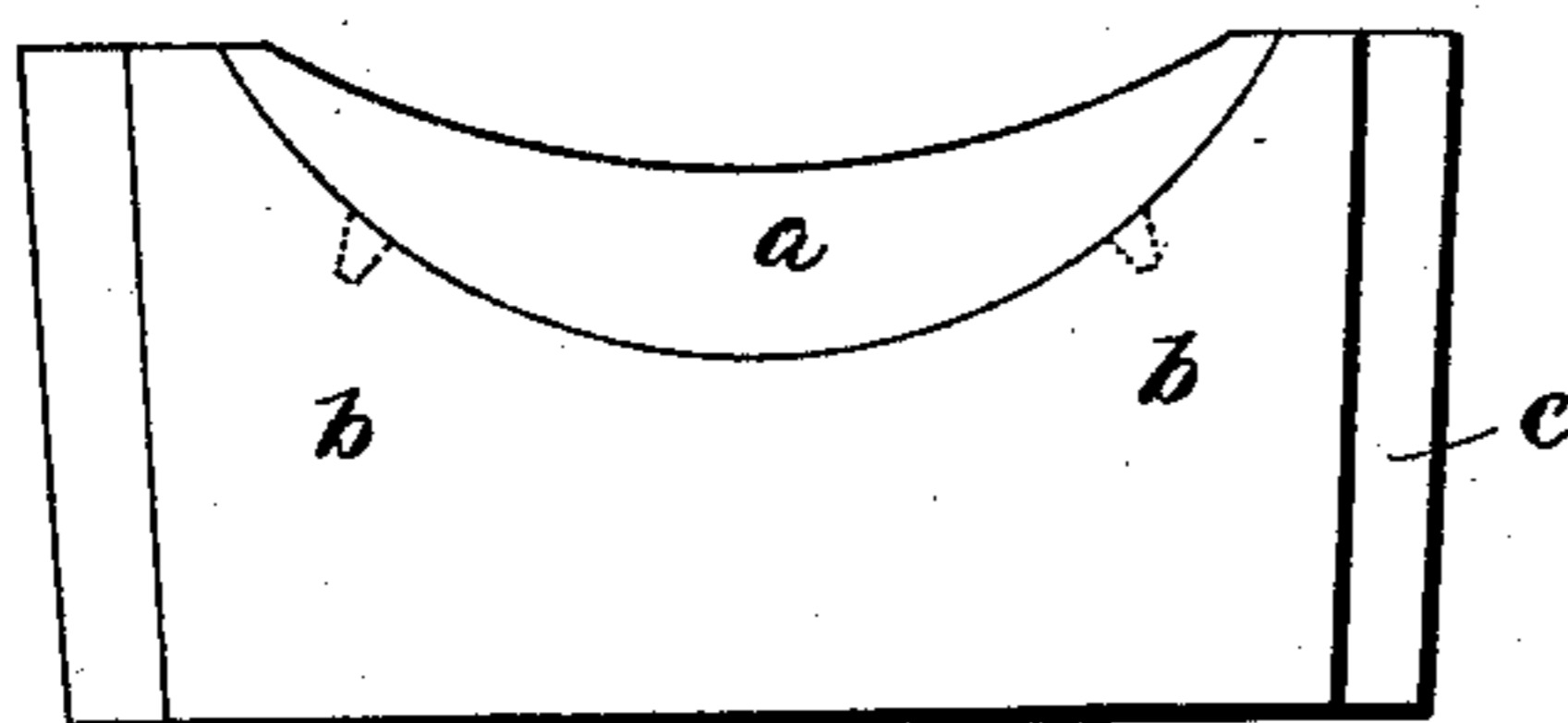
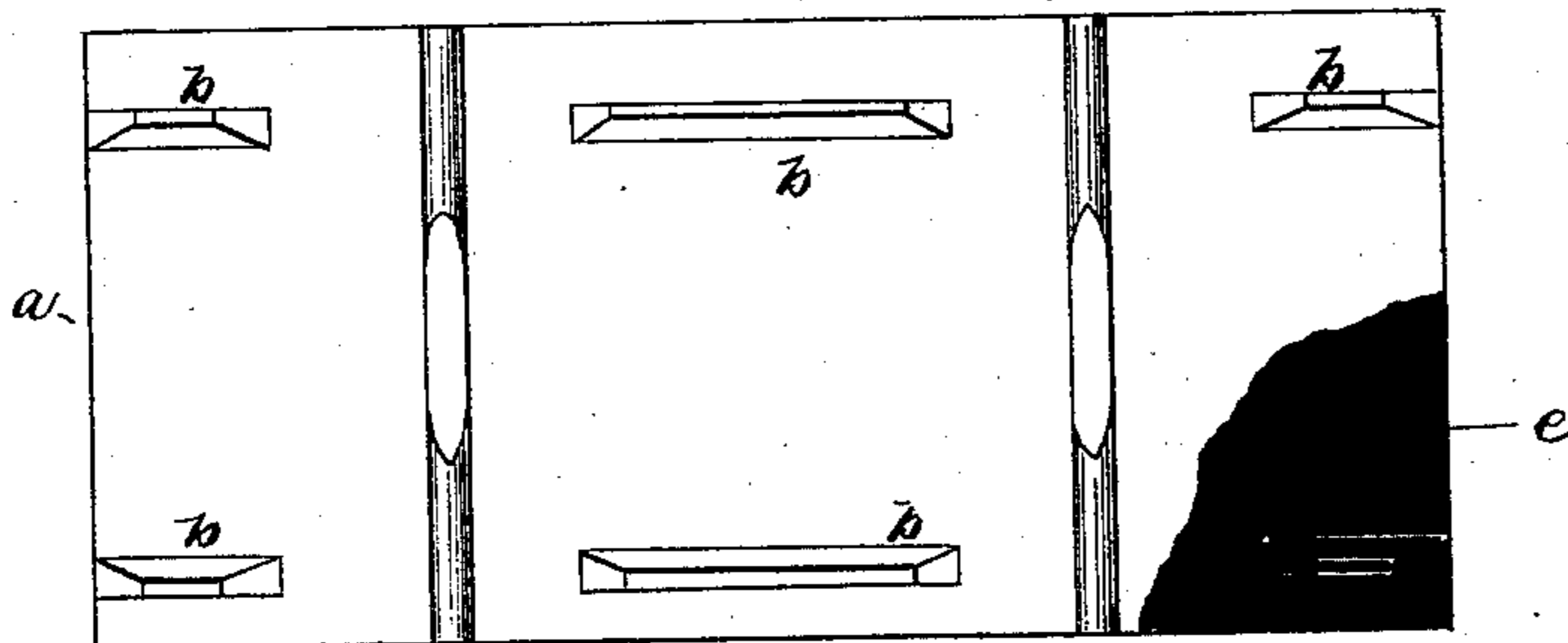


Fig. 2.



Witnesses,

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BEARING FOR SHAFTS, SPINDLES, &c.

SPECIFICATION forming part of Letters Patent No. 298,207, dated May 6, 1884.

Application filed December 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, SILAS J. HOWELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Bearings for Shafts, Spindles, &c., of which the following description, taken in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In the manufacture of bearings it is customary to cast or run a Babbitt or other soft-metal lining in a cast-metal box, usually of iron or brass, (or of so-called "composition metal,") so as to furnish a durable wearing-surface; and it is also customary to make the box or bearing entirely of composition metal, and so also bearings have been made entirely of a metal known as "Getchell metal," and substantially as described in Letters Patent No. 247,494, the said metal being chiefly of copper, hardened and made lasting. A box of composition metal presents a bearing harder and more durable than Babbitt metal, and it is preferable for all shafts where there is much concussion or strain, or where shafts or journals are run at very high speed; but the composition is much more expensive than the so-called "babbitted" bearing and usually requires more lubrication. The Getchell metal possesses those desirable qualities of hardness, smoothness, and durability to a greater extent than either so-called "composition metal" or Babbitt metal, and requires less lubrication; but the Getchell metal is too expensive to be generally employed. In experiments made having in view the production of the best possible bearing at the minimum cost, I discovered that the so-called "Getchell metal" might be incorporated with a cheaper metal by the process of casting, provided, however, that the baser metal used is fusible at a less degree of heat than the Getchell metal. In experiments carried on to enable a thin sheet or lining of Getchell metal to be made to adhere to the baser metal fused and poured into a mold containing the said Getchell metal shell or lining, it became necessary to apply to the said shell or lining a thin fluxing coating of metal, which should possess the quality of fusing at a less

degree of heat than either of the metals in the said mold, and in the experiments so conducted a metal composed of tin and bismuth (about ten per cent. of the latter) was found to work admirably, causing the said coating fused by the molten baser metal to effect an amalgamation or cohesion of the contiguous surfaces of the Getchell metal shell or lining with the baser metal body, a cohesion or amalgamation very different in effect and strength from that which could be produced by fluxes such as ordinarily employed when uniting one metal with another; and it is particularly noticeable with a fluxing coating such as described that the baser metal poured in molten state upon the solid Getchell metal shell or lining is not blown or made "spongy" as it is called, but is left solid and close.

Figure 1 in end elevation represents one form of a box or bearing embodying this invention, it being of suitable shape for the axle of a street-railway car; and Fig. 2 is a rear side view of the Getchell metal shell or lining before the baser metal body is poured upon it, one corner only of the said shell or lining in Fig. 2 being shown as provided with the fluxing coating.

The Getchell metal shell or lining *a*, of suitable size and shape for the shaft-journal or spindle to be supported by it, and preferably provided with projecting lugs or anchors *b*, will first be coated at its rear side with a metallic fluxing coating (partially shown at *c* in Fig. 2) of tin and bismuth, or their less efficient equivalent, tin and lead, the said coating being put on by means of a soldering-iron. A pattern of the shape of the box or bearing to be produced is placed in a sand mold and molded therein, and the flask is separated and the pattern is removed as in ordinary casting, and then the Getchell metal shell or lining is placed to partially fill the space in the sand left by removing the said pattern, and then the brass or other baser metal in fused state is poured into the sand mold against the rear side of the said shell or lining coated with the metal fluxing coating, as described. The fused baser metal fuses the fluxing coating, but does not fuse the Getchell metal shell or lining, ex-

cept for a short distance from its back toward its face, and the said baser metal *c* and coating, when cold, are found to be so thoroughly amalgamated with the said shell or lining at 5 its rear side as to form a line of metal which possesses greater tensile strength than either the baser or the Getchell metal. The lugs or anchors *b* are not considered as absolutely necessary; but they will preferably be used, as 10 thereby a greater surface is produced, with which the baser metal may come in contact.

In the application of the Getchell metal shell or lining into practical use, care will be exercised to make the latter of thickness slightly 15 in excess at its thinnest part of the distance which it is contemplated the shell or lining may wear without destroying the usefulness of the box, such provision preventing the line of junction of the baser metal with the Getchell metal from appearing to receive against it 20 the axle.

A box or bearing such as herein described composed of a Getchell metal shell incorporated with a body, *c*, of a baser metal, when finished, may be run with less friction and less 25 care as to lubrication than any other box known to me, and may be produced and sold at a price not in excess of that of the ordinary but less desirable and enduring solid 30 composition boxes referred to.

A bearing such as described, but of proper shape, may be used in connection with cross-heads for engines and crank-pin boxes.

The baser metal, which it is preferred to use for cheapness, is ordinary brass.

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I claim—

1. A bearing composed of a Getchell metal or hardened copper shell or lining, and an adhering baser metal body, the baser metal body and the back of the shell or lining being amal- 40 gamated or incorporated one with the other, substantially as described.

2. That improvement in the art or method of producing bearings which consists in coating a metal shell or lining with a metal flux- 45 ing coating, and then pouring upon the same in a mold a baser metal body fusible at a lower heat than the shell or lining, and capable of fusing the said metal fluxing coating, thereby amalgamating the opposed surfaces of the said 50 lining and baser metal body, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SILAS J. HOWELL.

Witnesses:

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