(No Model.)

C. E. HYDE.

BEARING FOR SHAFTS.

No. 414,221. Patented Nov. 5, 1889.

Fig. 1.

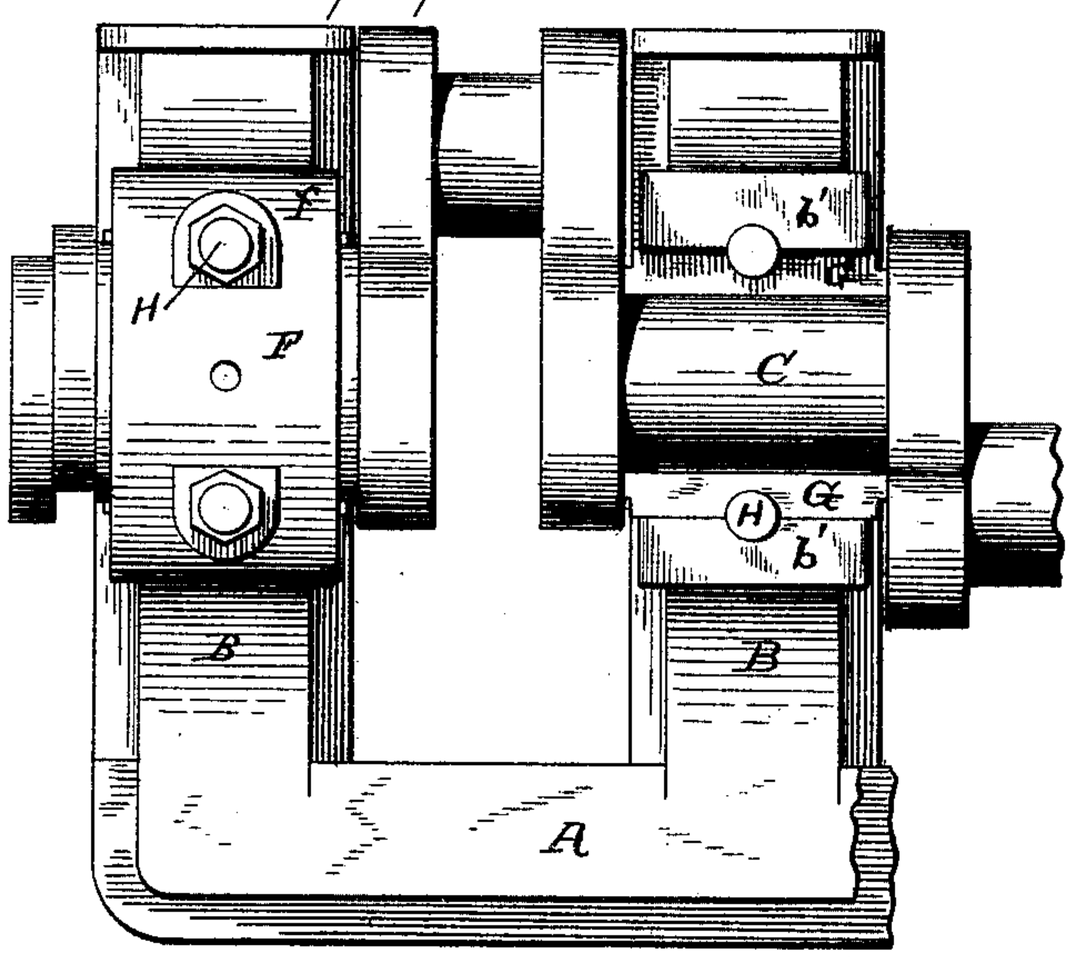


Fig. 2.

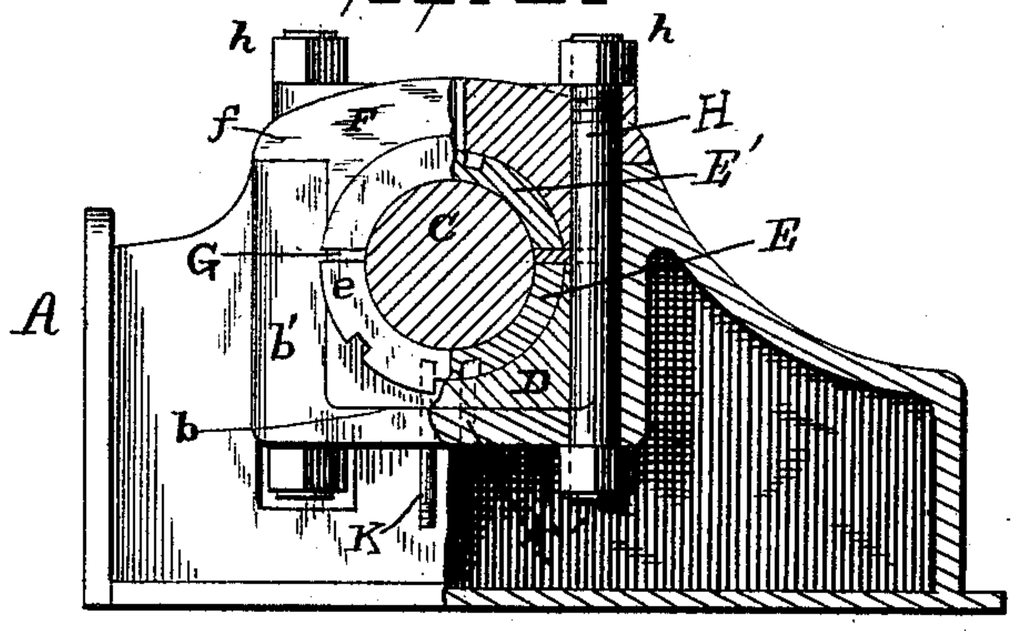


Fig. 3.

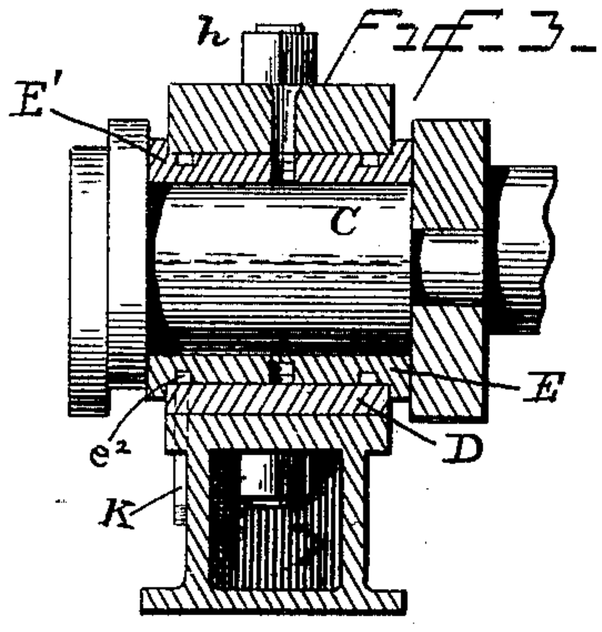
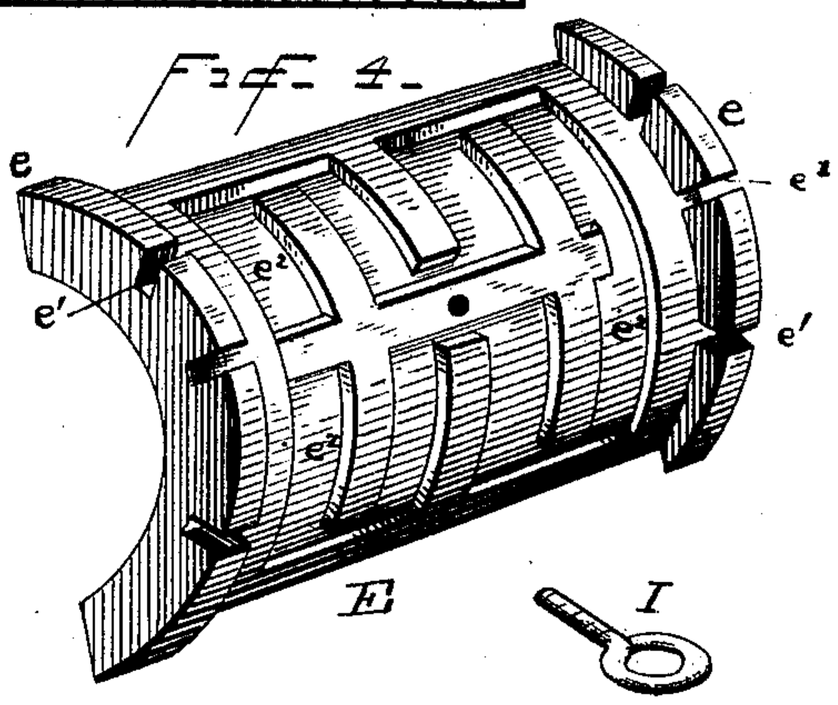


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES E. HYDE, OF BATH, MAINE.

BEARING FOR SHAFTS.

SPECIFICATION forming part of Letters Patent No. 414,221, dated November 5, 1889.

Application filed May 7, 1889. Serial No. 309,857. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HYDE, a citizen of the United States, residing at Bath, in the county of Sagadahoc and State of Maine, have invented certain new and useful Improvements in Bearings for Shafts; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to engineering, and more especially to marine steam-engines. Its object, primarily, is to obviate the practical difficulties heretofore experienced with the journal-bearings of marine-engine shafts; but it is applicable, also, to bearings for all kinds of shafts and shafting. The weight of a shaft is carried by the lower brass in the bearing, which consequently wears away faster than the upper brass and lets the shaft settle out of line. Moreover, in marine engines the bearings of the crank-shaft wear faster than those of the line-shaft and stern-shaft, which increases the difficulty of preserving their alignment. It is therefore necessary to frequently examine the lower brasses, especially those near the cranks, and to adjust them vertically, or scrape or rebabbitt them to make up for the wear, and realign the shaft. In the modern triple-expansion engine and other forms of multiple-crank engine it is in many cases impossible to remove the lower brasses without taking down the connecting-rods and hoisting the shaft out of the pillow-blocks. This is a tedious and laborious operation and, when done at sea, a dangerous one. The brass is usually square on the outside to fit the recess in the pillow-block, which prevents it from being removed by turning it around on the shaft, and the close proximity of the cranks and pillow-blocks prevents the brasses from being slid out endwise from the pillow-blocks. It is necessary, however, to retain the square shape of the brass to enable it to be readily adjusted vertically by means of shims inserted between the bottom of the brass and the bottom of its seat in the pillow-block, while the necessity for economizing room and other reasons forbid placing the cranks far enough away from the bearings to permit the endwise removal of the brasses. My invention obviates all these difficulties and enables any one or more of the brasses to be readily removed for rebabbitting or scraping without disturbing the shaft, and yet provides for their vertical adjustment by means of shims.

In the drawings, Figure 1 is a plan view of a part of the bed of a triple-expansion engine, showing the relative location of the cranks and pillow-blocks, the cap and upper brass being removed from one of the latter. Fig. 2 is a half cross-section half-elevation of one of the pillow-blocks embodying my invention. Fig. 3 is a longitudinal section, and Fig. 4 is an under side perspective view, of the lower brass.

The same letters refer to the same parts in all the figures.

The bed-plate A is provided with pillow-blocks B for the crank-shaft C, the bearings being located close to the cranks, as shown, for well-known reasons. This construction, as already pointed out, prevents the endwise removal of the brasses.

My improved bearing consists of the ordinary pillow-block B, provided with the usual flat seat *b* and parallel-faced jaws *b'*, forming a recess to receive the brasses. Instead of a solid brass, I provide a cast-iron chair D, fitted into the pillow-block. I employ any convenient means of adjusting the chair vertically, but prefer to use ordinary shims, and consequently make the chair with a flat bottom to fit the seat *b*, so that shims can be introduced beneath it, the same as when an ordinary square brass is used. The upper face of the chair has a semi-cylindrical hollow to receive the lower brass E, which is a semi-cylindrical bushing fitted smoothly to its place in the chair and having a flange *e* at each end to prevent it from accidental displacement in a lengthwise direction.

The cap F of the bearing may be fitted with an ordinary brass or with a semi-cylindrical upper brass E', similar to the lower brass E, the two brasses together forming the cylindrical bearing for the journal of the shaft. The brasses are kept from turning in their

seats in the chair D and cap F by means of metal liners G inserted between the meeting faces of the brasses, chair, and cap. Bolts H pass through the flanges *f* of the cap and down through the pillow-block, being let half into the block and half into the cap, liners, and chair, as shown. This prevents the liners and chair from moving endwise in the pillow-block, but does not interfere with their vertical adjustment.

Whenever it is desired to examine the lower brass, the nuts *h* are removed, the cap F and its brass E′ lifted out and the liners G taken up. The lower brass E can then be revolved around the shaft C by means of a spanner applied to the notches *e′* in the flange *e*. When the brass has come up on top of the shaft, it is free from the chair D and can be lifted out of the pillow-block, either by hand, or, if large and heavy, by suitable hoisting-tackle attached to an eye I screwed into a threaded hole in the brass.

The same brass, or a new one, can be inserted into the chair by reversing the operation for its removal, slipping it around the shaft until its edges are even with the top of the chair, and then replacing the liners G, the brass E′, and the cap F.

In order to cool the brasses, it has been customary to core them out and pump water through them. Such a construction would be impracticable with my improved bearing, and I have accordingly devised another mode of accomplishing the same purpose. In the outer face of the lower brass E is formed a groove e^2, preferably zigzag, as shown, coursing back and forth along the brass from one end to the other and back again. When the brass is placed in the chair, the groove forms with the adjacent face of the chair a continuous passage-way. A pipe K is inserted loosely through a hole in the lower part of the pillow-block and through the chair D, terminating at a point opposite the groove e^2, and preferably near one end thereof. The pipe K is connected with a supply of water which is forced to traverse the groove e^2, and escapes through a pipe K′, inserted into the chair in the same way as pipe K. Both pipes, being loose in the pillow-block, can rise with the chair D when it is adjusted vertically. This mode of cooling the bearing is applicable to the upper brass E′, and also to connecting-rod and other bearings, giving excellent results in practice. It will be seen that my bearing possesses marked advantages in the facility with which it can be examined and repaired. It necessitates some extra work in fitting it up; but the worth of the composition saved by using a semi-cylindrical brass instead of a square one more than compensates for the additional time and labor required.

My bearing is of service not only for marine-engine shafts, but for shafting of all kinds, and is especially valuable where the presence of cranks, collars, couplings, gear-wheels, belt-pulleys, or other parts renders it impossible to remove the ordinary style of brasses without unshipping the shaft.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A bearing for a shaft, provided with a vertically-movable chair having formed in its upper face a cylindrically-curved seat concentric with the shaft, and a removable brass fitting said seat, consisting of a segment of a cylindrical tube, substantially as described.

2. A shaft-bearing consisting of the combination, with a pillow-block, of a chair fitted to move vertically therein and having in its top a cylindrically-curved seat concentric with the shaft, a cylindrically-curved removable lower brass fitted within said seat, and a cap provided with an upper brass, substantially as described.

3. The combination, with a pillow-block having a square recess, of a flat-bottomed chair fitted therein, a semi-cylindrical brass seated in a semi-cylindrical hollow in said chair and provided with notched end flanges, a cap extending down toward the chair, and liners inserted between the chair and the cap, substantially as described.

4. The combination, with a bearing provided with a semi-cylindrical seat, of a semi-cylindrical brass seated therein having a groove formed in its outer face, and means for supplying water to said groove, substantially as described.

5. The combination, with the chair D, of the brass E, provided with the external groove e^2, and the pipes K K′, inserted through the chair and terminating adjacent to said groove, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. HYDE.

Witnesses:

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