No. 707,673. Patented Aug. 26, 1902.

J. C. BLEVNEY.

SHAFT OR AXLE BEARING.

(Application filed Dec. 29, 1900.)

(No Model.)

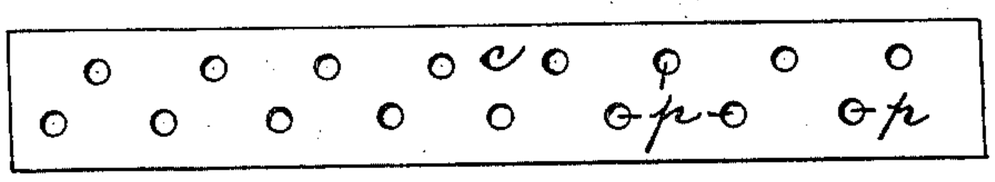


Fig. 1.

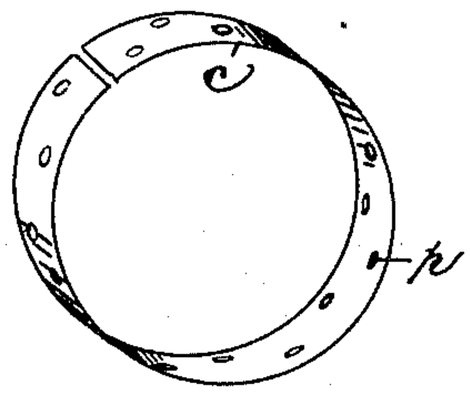
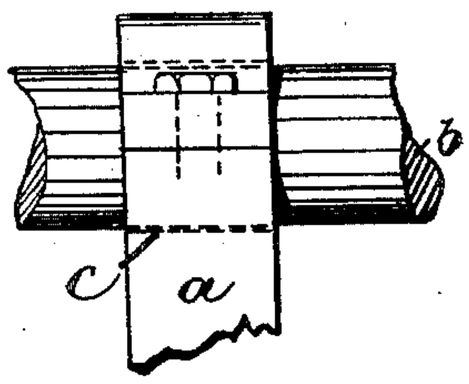


Fig. 2.

Fig. 3.



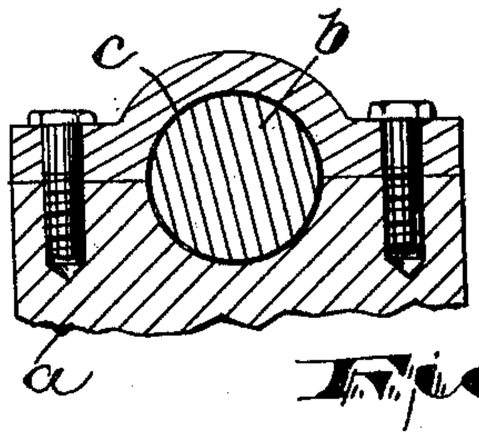


Fig. 4.

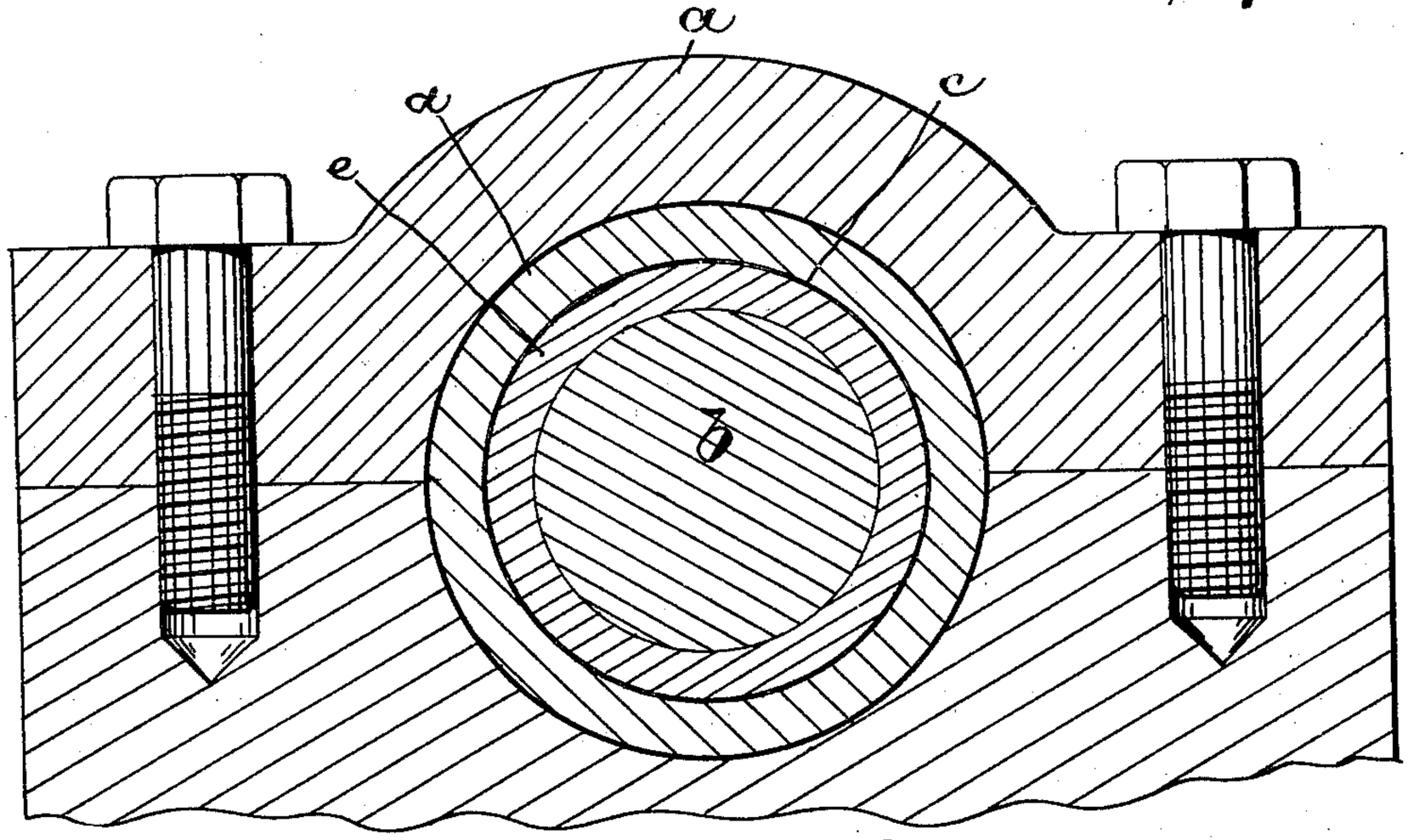


Fig. 5.

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SHAFT OR AXLE BEARING.

SPECIFICATION forming part of Letters Patent No. 707,673, dated August 26, 1902.

Application filed December 29, 1900. Serial No. 41,469. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BLEVNEY, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Shaft or Axle Bearings; and I do hereby 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 letters of reference marked thereon, which form a part of this specification.

The objects of this invention are to facilitate the operation of furnishing rotary hubs, shafts, and the like in automobiles, horseless carriages, or other machinery with antifriction-bearings, to enable such shafting to be so provided with antifriction-bearings with greater convenience and ease and at a reduced cost, and to provide other advantages and results, some of which will be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved antifriction-bearing for axles, shafts, and other rotary parts and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a plan of the improved bearing in the flat, and Fig. 2 is a perspective view of the same turned to be applied to the axle or shaft. Fig. 3 is a front view, and Fig. 4 is a sectional view, of a shaft and bearing-box furnished with the improved bearing; and Fig. 5 is a sectional view, on an enlarged scale, showing a variation of construction sometimes preferred.

In said drawings, *a* indicates a bearing-box of any suitable kind or construction adapted to receive a shaft or axle *b*, the said shaft rotating in said box or the box rotating on said shaft, a very narrow space being provided between said parts to receive one or more layers of the antifriction-bearing film *c*. Said bearing-film *c* is of extremely thin hardened steel, phosphor-bronze, or similarly hard metal and is of such thinness as to be easily flexible by hand, so as to be readily turned from its normally flat state (shown in Fig. 1) and made to fit closely around the shaft. It is of such thinness as to be easily cut by ordinary scissors, such as are always conveniently at hand, being commonly used in the household for cloth-cutting, &c. To enable the thin film of hard metal to be thus cut and easily flexed by hand to fit between the box and shaft, the said film is of the thickness of paper, in ordinary practice the thickness being from about two one-thousandths of an inch to about four one-thousandths of an inch. The film, furthermore, is resilient, and thus tends to assume its normal flat state of Fig. 1, and thus as the film rotates with the shaft, as it is free to do, and the pressure of said shaft changes from one part of the film to another the said film works slightly within its annular space, so that the lubricating-oil is drawn in between the parts to render the antifriction qualities of the bearing more perfect. Should the metal film overlap because of improper fitting or because of a stretching of the metal or for other reason and the bearing crowd the annular space, and thus render its removal advisable, the thinness of the film permits such removal without an interference with the proper working of the shafting or rotary part, the looseness thus occasioned being such as would not interfere with a working of such rotary parts until the defect can be cured. The film is preferably provided with perforations *p* for more effectually storing the lubricating-oil in the bearing; but these may be dispensed with. I also prefer to interpose the film between bushings *d e*, as shown in Fig. 5; but these may also be dispensed with. The hard film of spring metal takes the pressure of the rotary shaft and usually rotates with said shaft, and thus the frictional resistance is greatly reduced, and in practice the shaft rotates with nearly the ease of those supported on ball-bearings and without many of the disadvantages incident to ball-bearings, such as the grooving of the bearings, the danger of losing the balls, &c. Should the shaft show appreciable looseness in the box, such as would effect noticeable irregularity of action, a second or third film may be inserted in the space,

and thus the adjusting means sometimes provided for taking up wear may be dispensed with. The film may be rolled like ordinary tape, and thus be stored for use when needed, and should such need arise during a trip at a distance from a repair-shop said tape may be cut, as before described, by any suitable cutting implement conveniently at hand and at once applied without the exercise of careful mechanical skill. The thin film of hard metal, which in ordinary practice is only of from three one-thousandths to five one-thousandths of an inch in thickness, is not only so freely flexible as to be rolled and unrolled by hand and be easily inserted between the rotary and non-rotary members of the bearings, but when inserted between such members is capable of moving under the influence of the moving bearing, so as to have somewhat of a sinuous action, by which the liquid lubricant is virtually pumped between the film and the bearings on both sides thereof. To secure the desired freedom of movement, the said film is independent of said bearings and is free to move either with the movable bearing or stand at rest with the immovable bearing. Should the friction of the shaft be increased at one side of the film, so as to overcome the normally greater friction at the opposite side, said film will turn with the shaft, and thus bring a new bearing-surface to the point of greatest wear. The resiliency of the spring acts with the movable member of the bearing to facilitate the pumping or drawing in of the oil. The box at the outer side and shaft at the inner side of the film are smoothly finished, so as to present a proper surface on which the film may turn, and ordinarily the film is controlled by the outer member because of the greater frictional surface, and so if the outer member is stationary the film remains normally stationary, excepting as it is turned from time to time because of a temporary increase of friction. The freedom of turning is increased by the greater smoothness of finish of the opposite bearing-surfaces and by the films of oil which lie intermediately at opposite sides of the film. The single film extends entirely around the shaft, being short of a complete encircling only sufficient to prevent or insure against an overlapping of ends when the film or the inner bearing member wears away. This practically complete encircling enables the turning of the film to be effected without interference with a proper operation of the bearing parts.

Having thus described the invention, what I claim as new is—

1. The combination with a shaft and its box, one having a rotary relation to the other, of a thin, flexible and resilient sheet of hard metal loosely interposed between said shaft and box and extending in a single piece substantially around the whole periphery of the shaft, the said sheet being free to either turn with the rotary member, or to remain at rest with the stationary member, substantially as set forth.

2. The combination with a shaft and its box, one having a rotary relation to the other, of a thin, flexible and resilient sheet of hard metal loosely interposed between said shaft and bearing, the said sheet of hard metal, being free to turn with the rotary member, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of December, 1900.

JOHN C. BLEVNEY.

Witnesses:
CHARLES H. PELL,
C. B. PITNEY.