A. PONTEN.

FLUID CUSHIONED BEARING.

APPLICATION FILED DEC. 12, 1908.

913,233. Patented Feb. 23, 1909.

Fig. 1.

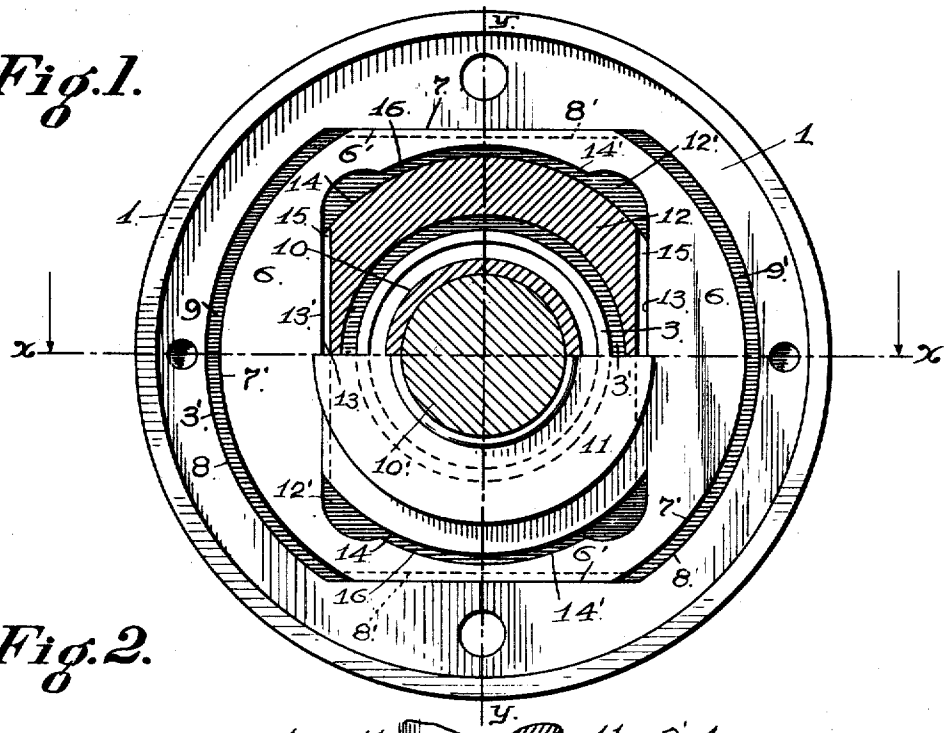


Fig. 2.

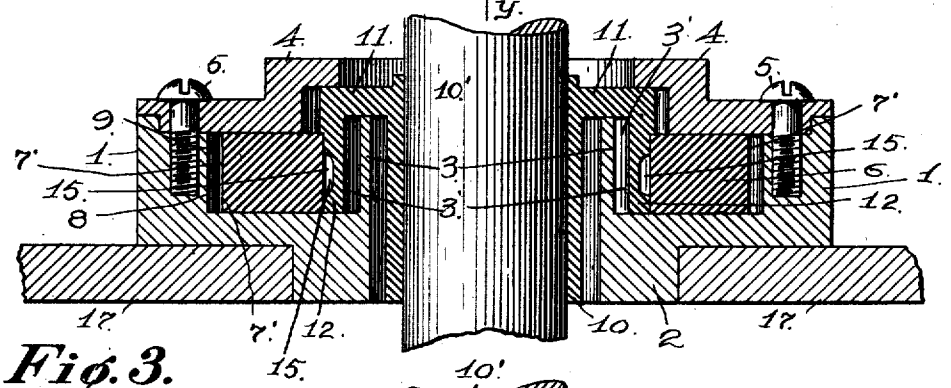
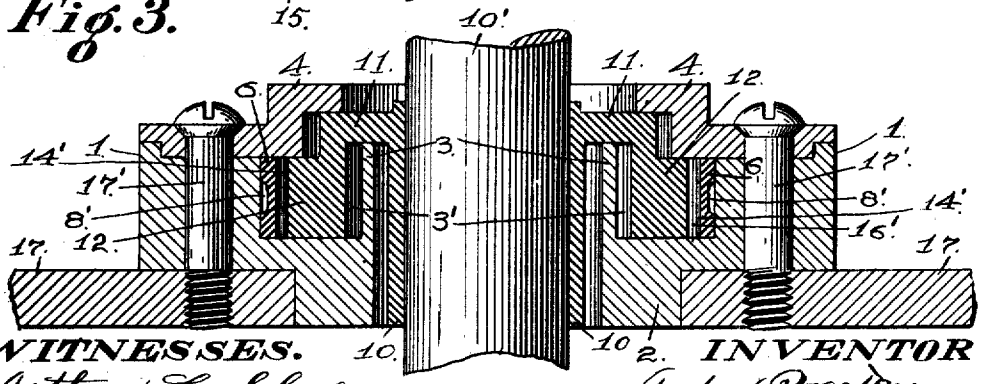


Fig. 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

ANDERS PONTEN, OF BERKELEY, CALIFORNIA.

FLUID-CUSHIONED BEARING.

No. 913,230. Specification of Letters Patent. Patented Feb. 23, 1909.

Application filed December 12, 1908. Serial No. 467,193.

To all whom it may concern:

Be it known that I, ANDERS PONTEN, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Fluid-Cushioned Bearings, of which the following is a specification.

The hereinafter described invention relates to an improved fluid cushioned bearing for use more particularly in connection with comparatively heavy shafts driven at a high rotative speed; the object of the invention being the production of a bearing of the described character which will slowly adjust itself in all directions to the lateral strains placed thereon by the swinging action or gyratory motion of the rotating shaft extended therethrough, the compensating action of the bearing providing against shocks, jars or irregular strains being transmitted to the means driven thereby, thus securing the transmission of a uniform motion of rotation.

To comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a plan view of the outer casing or shell with its cover removed, within which casing or shell is fitted the slide block and the bearing sleeve, the said sleeve being partly sectioned vertically to illustrate the position of its depending wall relative to the slide block. Fig. 2 is a cross sectioned elevation taken on line *x*—*x* Fig. 1 of the drawings viewed in the direction of the arrow. Fig. 3 is a similar view taken on line *y*—*y*, Fig. 1 of the drawings.

In the drawings, the numeral 1 designates the outer cylindrical shell or casing of the bearing, from the apertured bottom 2 of which springs the inner upwardly projecting circular wall 3. The said circular wall or flange 3 acting in conjunction with the inner face of the shell or casing 1 forms an inner fluid receiving chamber 3′, which chamber is closed by the cover plate 4 secured thereto preferably and held in place by means of the securing screw 5.

Within the outer shell or casing 1 is fitted for horizontal movement in one direction, an open slide block 6, formed with the flattened faces 6′ which register with the flattened faces 7 of the shell or casing 1; the circular faces 7′ of the said slide block 6, conforming to the circular faces 8 of the inner wall of the shell or casing 1. The diameter of the slide block 6 through the circular portion thereof is slightly less than the diameter of the shell or casing 1 on the same cross section, so that the said slide block is permitted horizontal movement in one direction, although confined against movement in the opposite direction. Within each flattened face 6′ of the slide block 6 is cut a longitudinal groove or channel 8′, which communicates with the curved passages 9—9′ formed between the faces 7′ of the said block and the faces 8 of the outer shell or casing 1, which grooves or channels 8′ form runways for the flow of fluid from one of the end passages to the opposing end passage, on the movement of the slide block 6 in either direction.

Within the circular wall or flange 3 is fitted the bearing sleeve 10, which is slightly less in diameter than the said circular wall or flange 3, and through the said bearing sleeve 10 extends and works the spindle or shaft 10′. This bearing sleeve 10 is formed with a projecting shoulder extension 11, which terminates in the depending wall 12. The said depending wall, when the bearing sleeve is dropped into the circular wall or flange 3, fits and works within the field 12′ of the slide block 6. The flattened faces 13 of the depending wall 12 work against the inner flattened faces 13′ of the slide block 6, the curved or circular faces 14 of the said wall 12 conforming to the curved inner faces 14′ of the slide block 6. Inasmuch as the depending wall 12 is slightly less in diameter than the field 12′ of the slide block 6, the same is permitted limited horizontal movement therein, the horizontal movement of the said wall 12 being in an opposite direction to the horizontal movement permitted the slide block 6.

In each flattened face of the depending wall 12 of the bearing sleeve 10 is formed a longitudinal groove or channel 15, which communicates with the passages 16—16′ between the faces 14 of the said wall 12 and the faces 14′ of the slide block 6.

The cover plate 4 is formed with a central aperture through which projects the spindle or shaft 10′, and the said cover plate is shaped to bear onto the slide block 6 and the

shouldered extension 11 of the bearing sleeve 10, although the pressure thereof onto said parts is not sufficient to interfere with the free movement thereof within the outer shell or casing 1.

The outer shell or casing 1 is illustrated, in the present case, as attached to a non-rotating structure 17, being held thereto by means of the securing bolts 17′, Fig. 3 of the drawings.

In assembling the parts, the fluid receiving chamber 3′ of the outer shell or casing is first filled with quicksilver, glycerin, or any viscous fluid. The slide block 6 is then placed within the outer shell or casing, its open field 12′ retaining a portion of the fluid placed within the chamber 3′. The bearing sleeve 10 is then fitted within the projecting circular wall or flange 3, its depending wall 12 resting within the open field 12′ of the slide block, and the slide block and the bearing sleeve 10 held in place by securing to the outer wall or casing 1 the cover plate 4, which cover plate acts additionally to prevent the fluid splashing from within the fluid holding chamber of the outer shell or casing during the movement of the slide block 6 and depending wall of the bearing sleeve 10.

By reason of the flattened faces of the depending wall 12 acting against similar inner faces of the slide block, and the outer flattened faces of the said block acting against corresponding faces of the outer shell or casing 1, the bearing sleeve 10 is held against rotation, although it is free to give slowly to lateral strains placed thereon by irregular rotation or gyratory movement of the spindle or shaft 10′. The moment the said spindle or shaft varies from its vertical axis of rotation, the same acts against the bearing sleeve and seeks to rapidly throw the same outwardly. This tendency for rapid outward movement of the bearing sleeve is resisted by the body of viscous fluid sealed within the outer shell or casing, bearing respectively against the curved end walls of the slide block and the depending extension of the bearing sleeve. However, the body of fluid will slowly, but gradually give or change under the influence of the deforming force being acted thereon by the outward pressure exerted by the irregular movement of rotation of the spindle or shaft 10′ onto the bearing sleeve 10, permitting the said sleeve to gradually give and slowly move under the influence of the pressure of the said rotating spindle or shaft, without transmitting such irregular motion of the spindle or shaft to the mechanism driven thereby; the said fluid cushioned bearing thus acting as a compensating means for the rotating spindle or shaft.

Having thus described the invention what is claimed as new and desired to be protected by Letters Patent is:—

1. A fluid cushioning bearing, the same comprising a non-rotating outer shell or casing having a fluid chamber therein, a slide block held therein for horizontal movement in one direction, a laterally movable bearing sleeve provided with a downwardly extending wall held within the field of the slide block for horizontal movement in a direction opposing the movement of the slide block, and a cover plate for the outer shell or casing acting to seal the fluid chamber thereof and hold the slide block and bearing sleeve within the said outer shell or casing.

2. A fluid cushioned bearing, the same comprising a non-rotating outer shell or casing having a fluid chamber therein, an open slide block held therein against rotation but free to move horizontally in one direction, a bearing sleeve provided with a depending wall held within the field of the open slide block against rotation but free to move horizontally in a direction opposed to the movement of the slide block, and channels or grooves cut in faces of the slide block and in faces of the depending wall of the bearing sleeve for permitting the shifting of the fluid held within the outer shell or casing on the movement of the said parts in either direction.

3. In a bearing for the described purpose, the combination with the outer shell or casing thereof having a fluid chamber therein, of a slide block held therein against rotation but free to move horizontally in one direction, a bearing sleeve, and connection between the sleeve and the slide block for holding the said sleeve against rotation while permitting horizontal movement thereof in a direction opposing that of the slide block without transmitting such movement to the said block.

4. In a bearing for the described purpose, the combination with the outer shell or casing thereof having a fluid chamber therein, of a laterally movable bearing sleeve extended within the fluid chamber of the outer shell or casing, and a slide block located within the said fluid chamber for holding the bearing sleeve against rotation.

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

ANDERS PONTEN.

Witnesses:
N. A. Acker,
D. B. Richards.