

H. HESS.
 BALL BEARING.
 APPLICATION FILED JUNE 25, 1909.

967,520.

Patented Aug. 16, 1910.

Fig. 1.

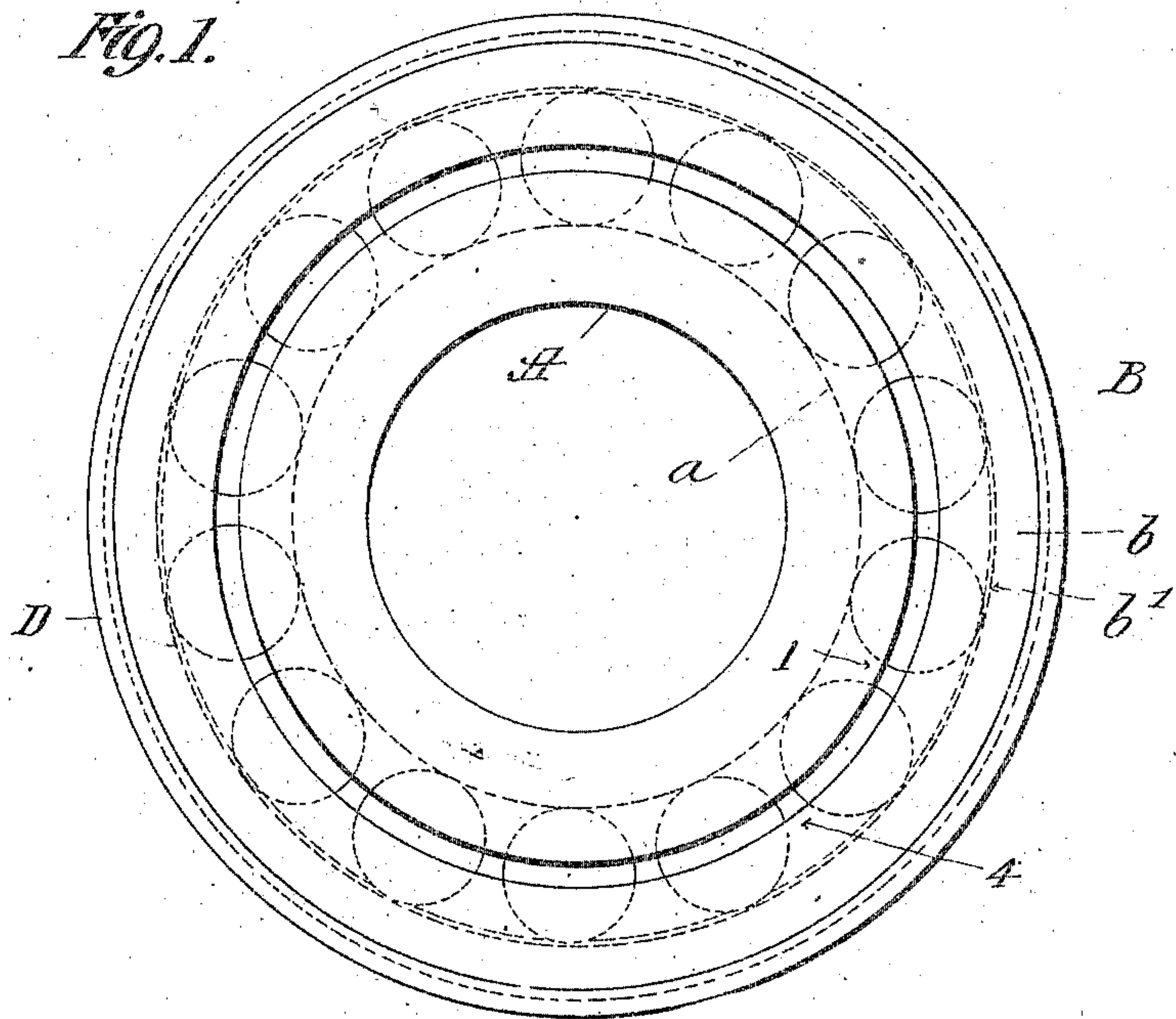


Fig. 2.

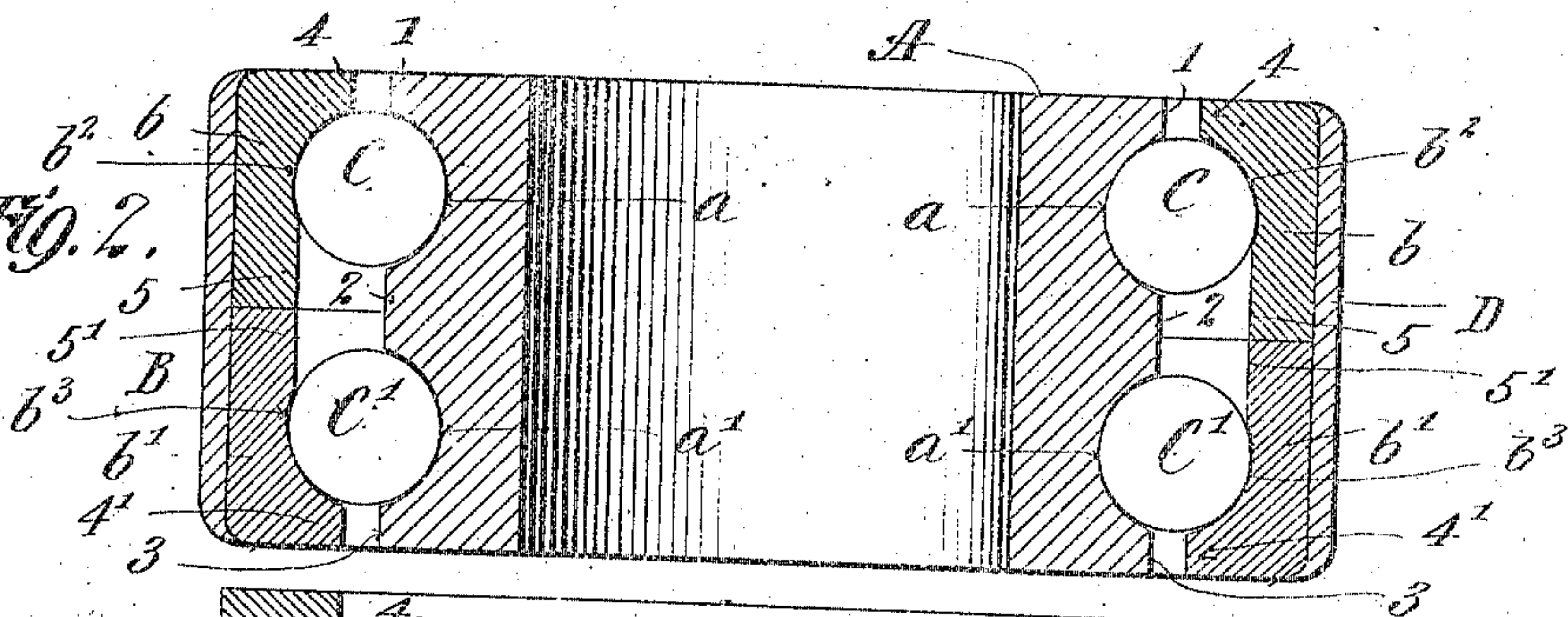
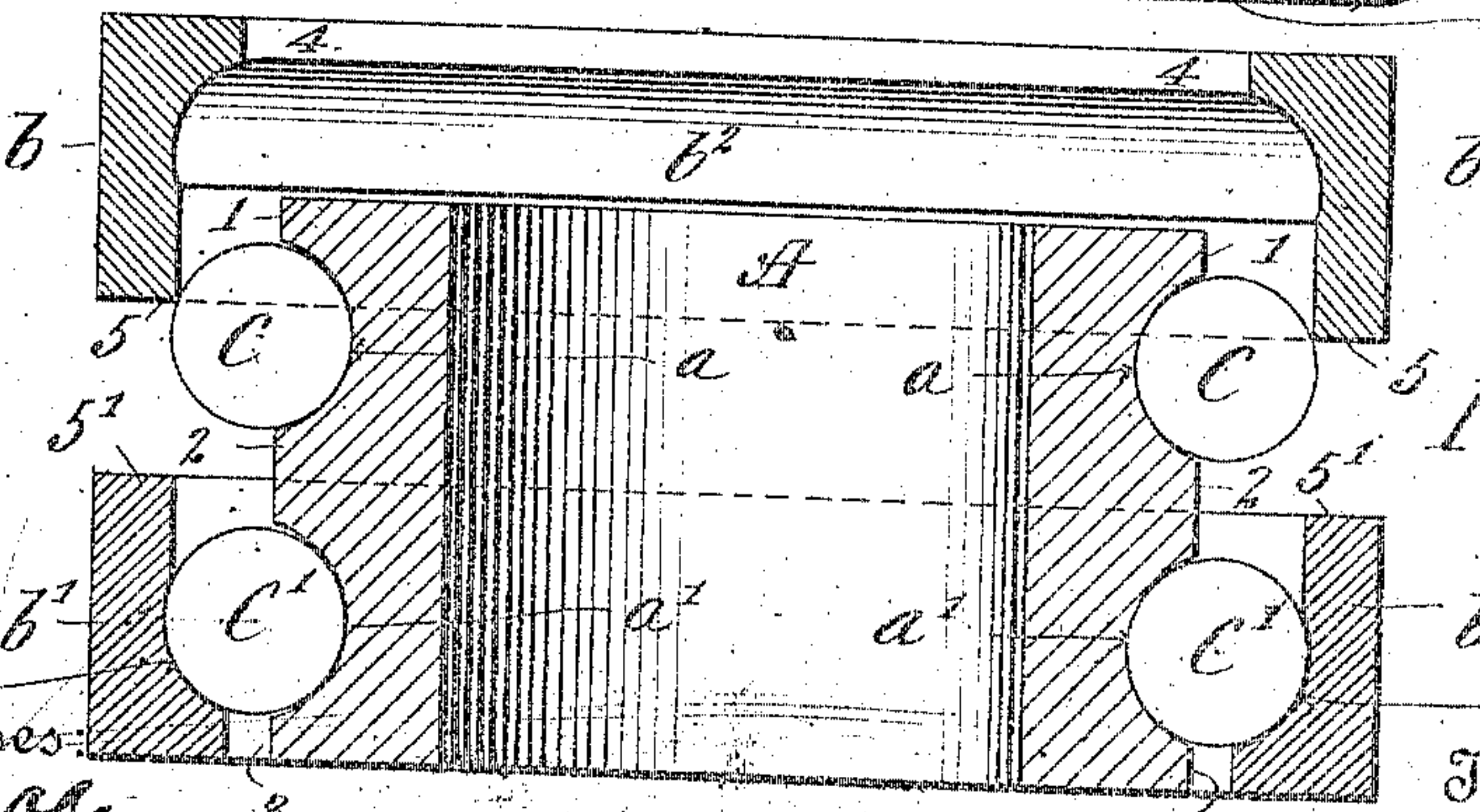


Fig. 3.



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HENRY HESS, OF WAWA, PENNSYLVANIA.

BALL-BEARING.

967,520.

Specification of Letters Patent.

Patented Aug. 16, 1910.

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To all whom it may concern:

Be it known that I, HENRY HESS, a citizen of the United States, residing at Wawa, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Ball-Bearings, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to ball bearings, and more particularly to that class thereof provided with a plurality of rows of balls.

The general object sought to be attained is the provision of a bearing that will withstand thrust in addition to radial pressure, which is compact and readily assembled, and generally which meets the requirements of commercial use.

To these ends the invention consists broadly in forming each of the casing members with a plurality of uninterrupted tracks for the several series of balls, such tracks constituting well defined paths, and one of the casing members being constructed in a plurality of sections to permit the ready assemblage of the parts.

As shown in the drawing and herein described, the tracks in one of the casing members are comparatively deep, and in the other casing member are comparatively shallow, this arrangement permitting the assemblage of the several parts by forcing, due to the inherent elasticity of the material.

In some respects this improved construction resembles a form of bearing known in the art, and as shown for instance in the U. S. Letters Patent to E. G. Hoffman, No. 774,427, November 8, 1904. As shown in the said Letters Patent, one of the casing members is formed with a plurality of grooves, which grooves are described as contacting with the balls at one point only; and the other casing member as having an interior cylindrical bearing surface on which the balls bear at one point only.

It is the purpose of my invention to improve upon this construction by the provision of tracks or ways in each of the casing members, which tracks constitute well defined paths, and so that the bearing becomes adapted to support end thrust in addition to radial load, in a manner not possible in a bearing where the ball paths are not well defined, and where in the event of end pressure the tracks are of such character as not to permit of the transmission of the thrust from both

casing members to the balls. Another feature of advantage involved in this arrangement is the capability of easy assemblage coupled with the compact and permanent character of the bearing when assembled. Again, the tracks or ways are not interrupted by filling openings, and because of this feature the balls run readily and without obstruction in their paths.

Referring to the drawing: Figure 1 is a side view of a bearing embodying my invention, certain of the parts being shown in dotted lines; Fig. 2 is a transverse section of the bearing; and Fig. 3 is a similar view indicating the method of assemblage.

The bearing comprises an inner casing member A and an outer casing member B, each formed with a plurality of tracks or ways, respectively a , a^1 , and b^2 , b^3 , wherein the series of balls C, C¹ are mounted and operate. One of the casing members, in the present instance the outer one B, is constructed in two sections b , b^1 , which sections after assemblage may be connected together in any desired manner, as by the sleeve D. It is to be noted that the tracks or ways for the balls, a , a^1 , in the member A and b^2 , b^3 in the member B, are both of them formed as grooves which pass beyond and project over the contact lines of the balls with the respective casing members. It is also to be noted that these tracks or ways throughout their extent are uninterrupted by breaks such as would occur if filling openings were employed for the introduction of the balls therein, and that because of this formation the balls travel without obstruction and are unimpeded in their course; and further, that because of the groove-like formation of the tracks or ways, they constitute well defined paths for the balls, and are thus capable of transmitting lateral pressure in addition to radial load.

In my preferred form of construction, as shown in the drawing, in one of the casing members, as for instance the inner member A, the tracks or grooves a , a^1 , are comparatively deep, so as to substantially embrace the balls throughout their extent. Also in the example shown, the outer casing member B, is formed at opposite sides of the tracks or ways b^2 , b^3 with inwardly projecting shoulders 4, 4¹, which in assembled position are located in near proximity to the opposed shoulders 1 and 3 of the inner member A. In order to facilitate the as-

semblage of the parts I form the inner cylindrical portions 5, 5', of the outer member B, between the tracks or ways b^2 , b^3 , of considerably less depth than that of the opposed cylindrical portion 2, between the tracks or ways a , a' of the member A. It is pointed out, however, that these cylindrical portions 5, 5', are not tangentially arranged with regard to the balls C, C', but extend from the inner extremity of the comparatively shallow grooves b^2 , b^3 . The sections b , b^1 , of the casing member B are thus formed with the shallow grooves and the cylindrical extensions therefrom, as above described, for the purpose of permitting the ready assembly of the parts. This will be apparent from Fig. 3, wherein the section b is shown as about to be passed over the balls C, which are then located in the groove a of the member A. Notwithstanding the slightly greater diametric dimensions of the series of balls C, when located in the groove a , the section b may nevertheless be forced thereover into assembled position, or until it abuts against the section b^1 , this forcing operation being permitted by the natural elasticity and resiliency of the materials employed. After the cylindrical portion 5 of the section b passes over and beyond the balls C, the latter take their proper positions in the groove b^2 , and the temporarily displaced cylindrical portion springs into its normal and assembled position, as shown in Fig. 2. The section b^1 is, of course, similarly assembled by forcing it over the balls C'.

As previously stated the assembled bearing is not only capable of supporting radial load in the ordinary manner, but because of its peculiar construction is also well adapted to take lateral thrust as well; and moreover, because of the resiliency of the material, when once assembled in the manner described, the several parts are not liable to become displaced. If desired, however, an additional securing means, such as the sleeve D may be applied to the united sections as shown in Fig. 2.

I have herein shown and described a preferred form of the embodiment of my invention, but obviously many changes and alterations may be made therein without departure from its spirit, and generally speaking I desire it to be understood that I do not limit myself to any specific form or arrangement of parts, except in so far as such limitations are embodied in the claims. Thus for instance instead of springing or forcing

the casing member over the balls in the manner previously described, the parts may be expanded or contracted sufficiently by heat or cold to permit or at any rate to facilitate their assembly. Or again instead of forming the inner surface of the casing member cylindrically, it may be grooved or fluted so as to permit its passage over the balls and their introduction into the groove therein. These and other well known equivalents will suggest themselves to those skilled in the art.

Having thus described my invention, its construction and mode of operation, what I desire to claim and secure by Letters Patent of the United States is as follows:

1. In a ball bearing, the combination of casing members each formed with a plurality of uninterrupted grooves constituting defined paths and adapted to engage the balls therein at both sides thereof, and a corresponding plurality of series of balls located therein, one of the casing members comprising a plurality of sections, coöperatively disposed to transmit lateral thrust; and the edges of certain of the grooves and the contiguous portions of the casing members being so reduced as to permit the assembly of the parts and the passage of the balls into the grooves; whereby the engagement of the balls in the grooves holds the several parts of the bearing together, and also serves to transmit lateral thrust in both directions.

2. In a ball bearing, the combination of casing members each formed with a plurality of uninterrupted grooves constituting defined paths and adapted to engage the balls therein at both sides thereof, and a corresponding plurality of series of balls located therein, the grooves in one of the casing members being comparatively deep and the grooves in the other casing member being comparatively shallow, and one of the casing members comprising a plurality of sections so that the several parts may be forced into assembled position; the said sections being coöperatively disposed to transmit thrust; whereby the engagement of the balls in the grooves holds the several parts of the bearing together, and also serves to transmit lateral thrust in both directions.

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

HENRY HESS.

Witnesses:

NETTIE L. HAIN,
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