

(No Model.)

2 Sheets—Sheet 1.

T. J. TELLEFSEN.

GUIDE FRAME FOR LOOSE ROLLS IN JOURNAL BEARINGS.

No. 604,572.

Patented May 24, 1898.

Fig. 1.

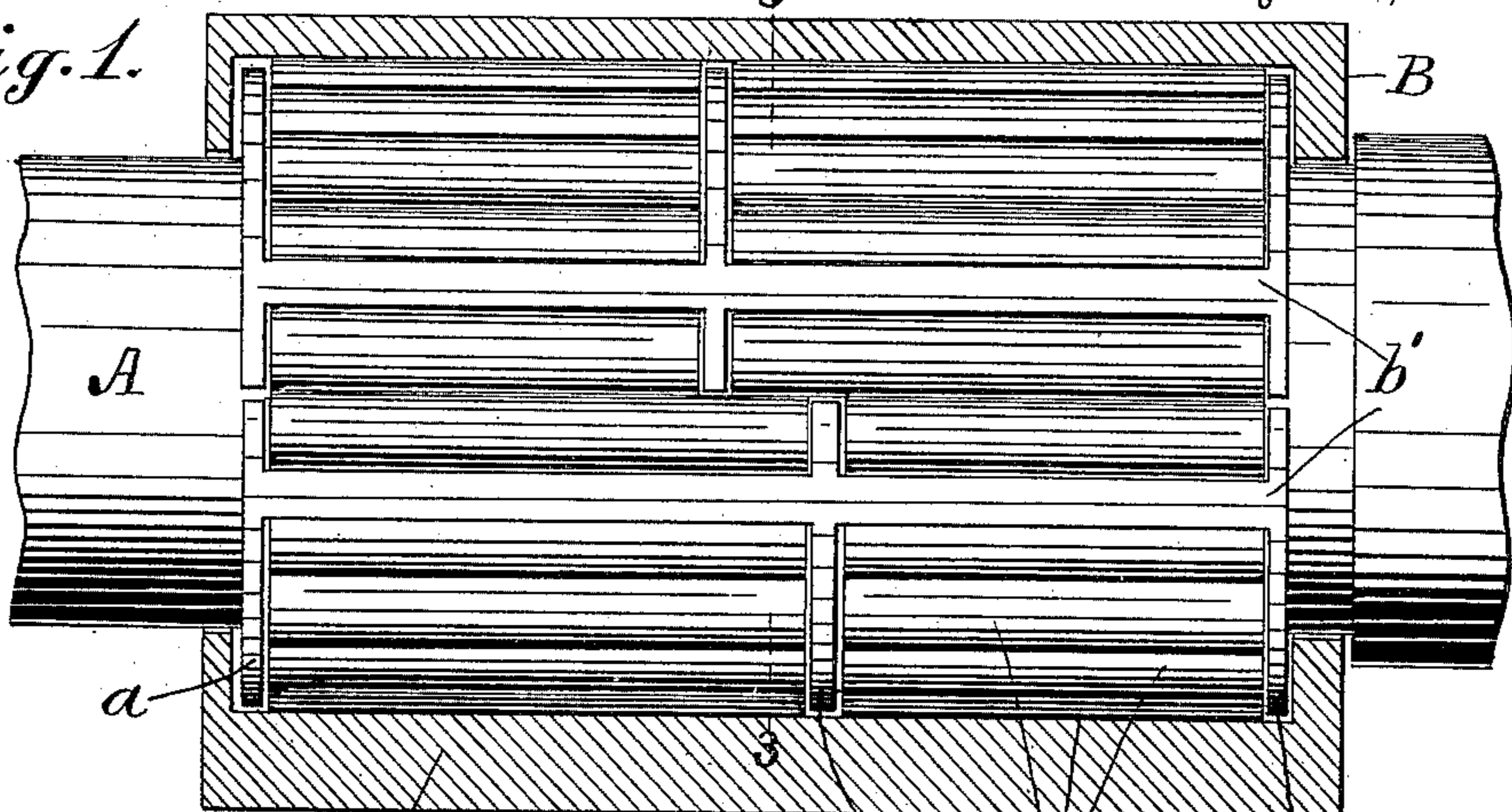


Fig. 2.

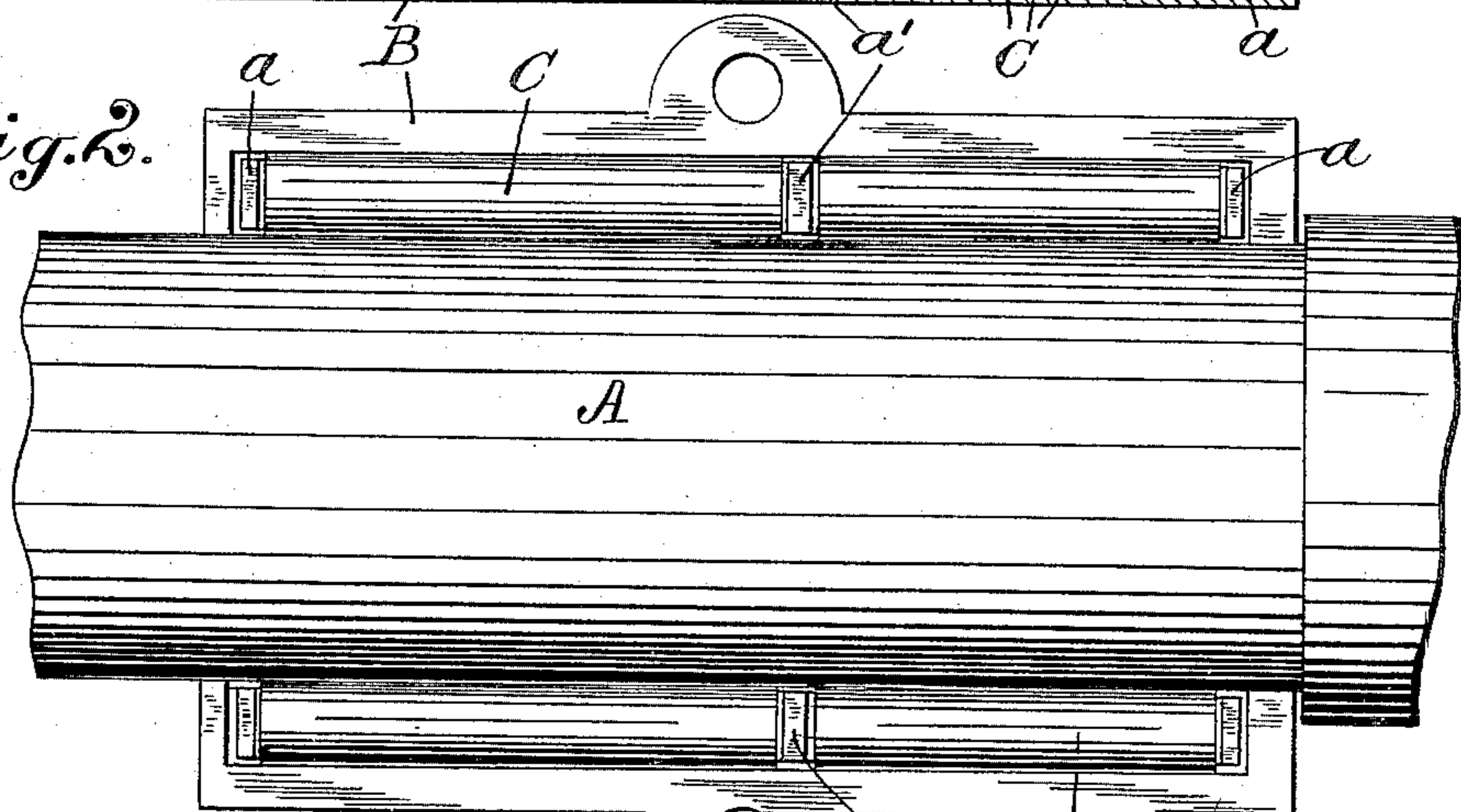


Fig. 3.

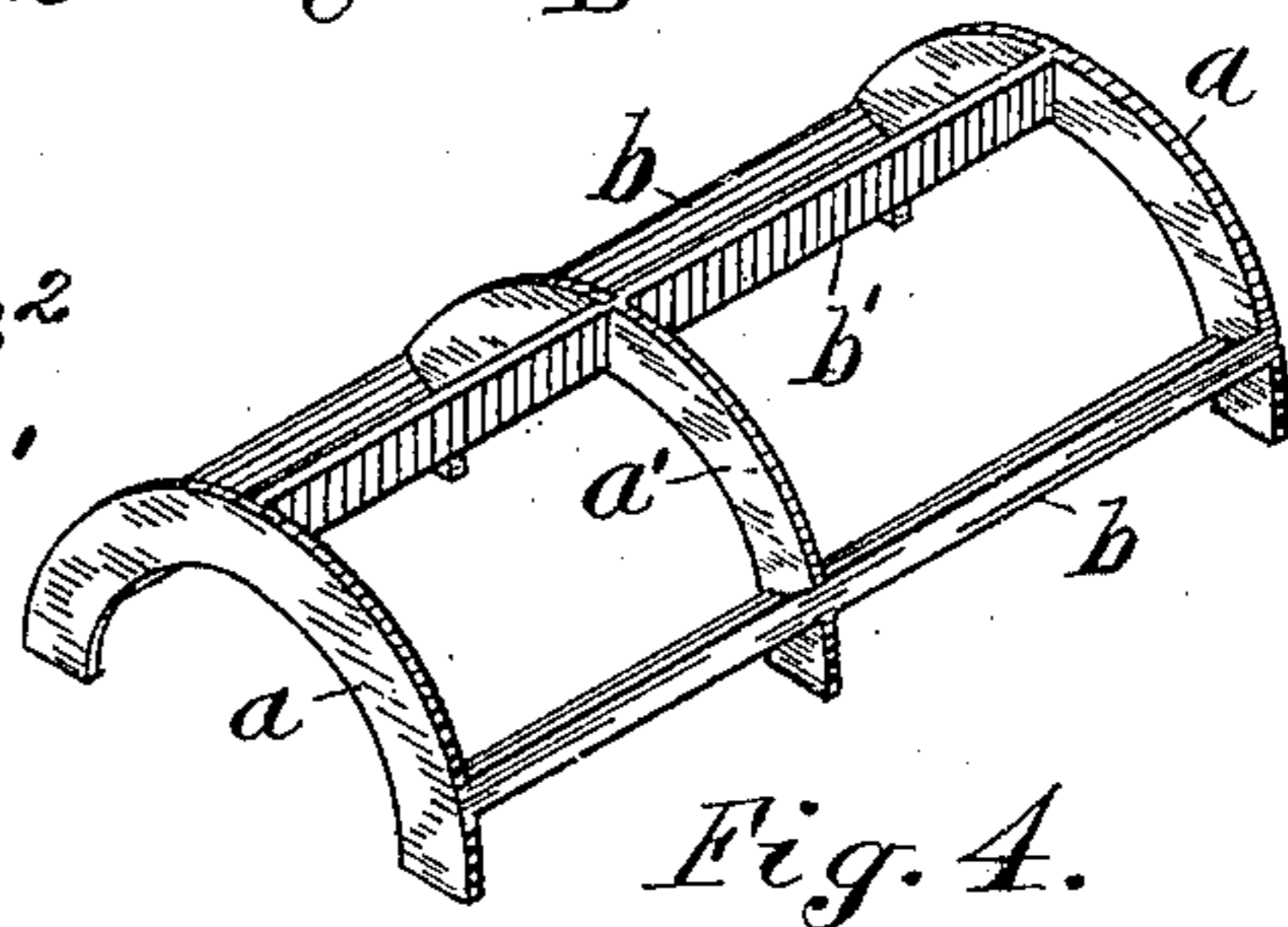
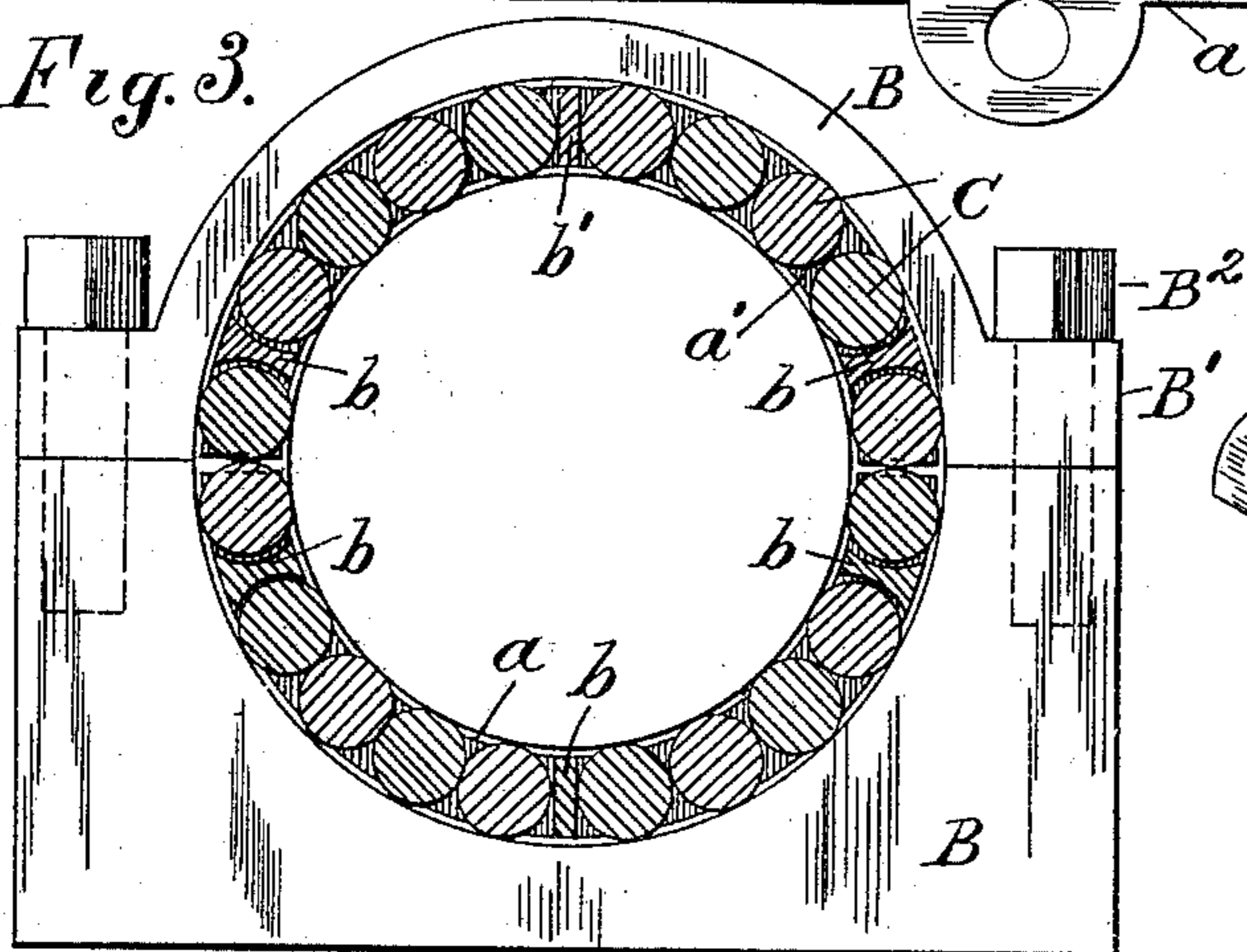


Fig. 4.

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2 Sheets—Sheet 2.

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Fig. 5.

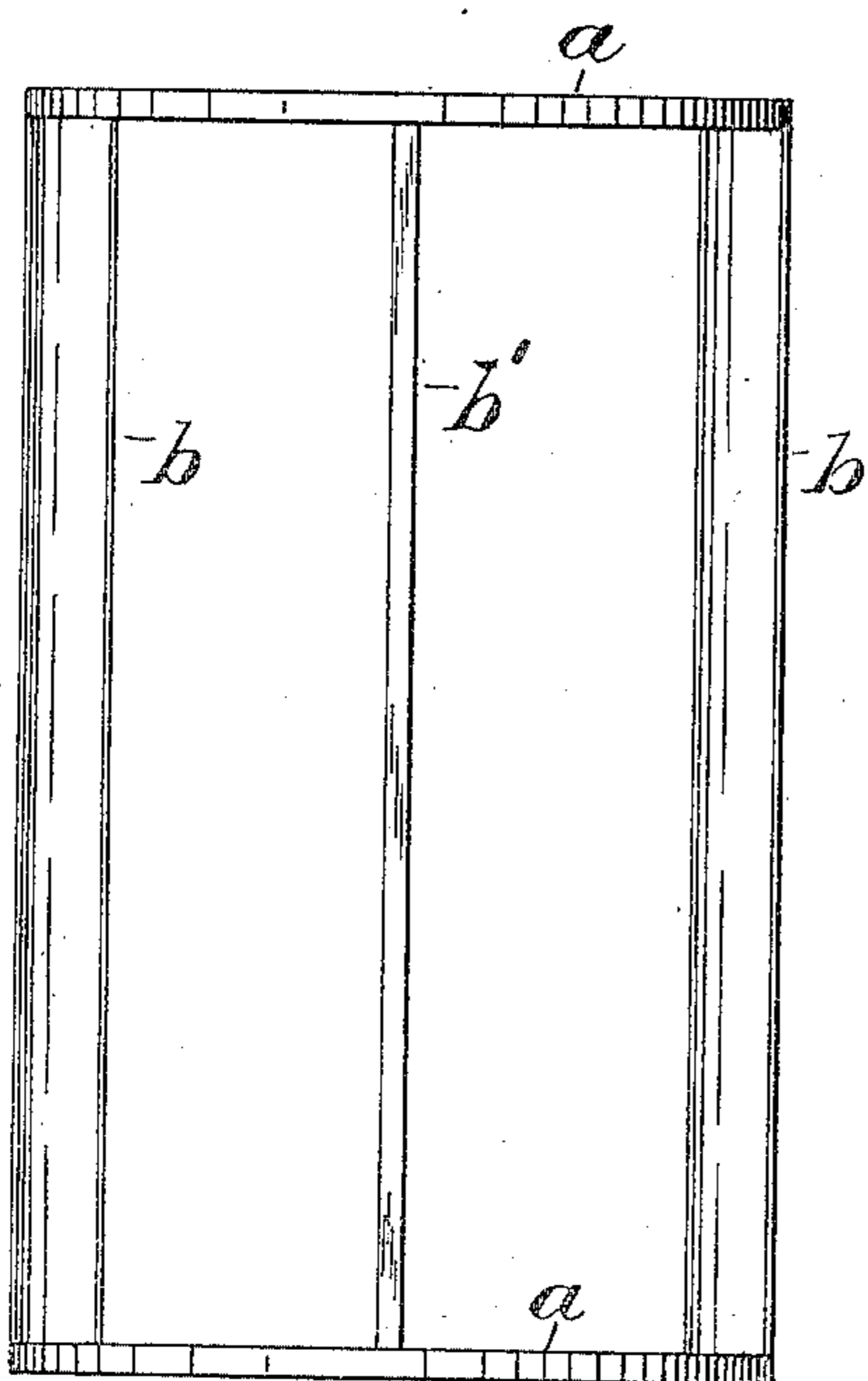


Fig. 6.

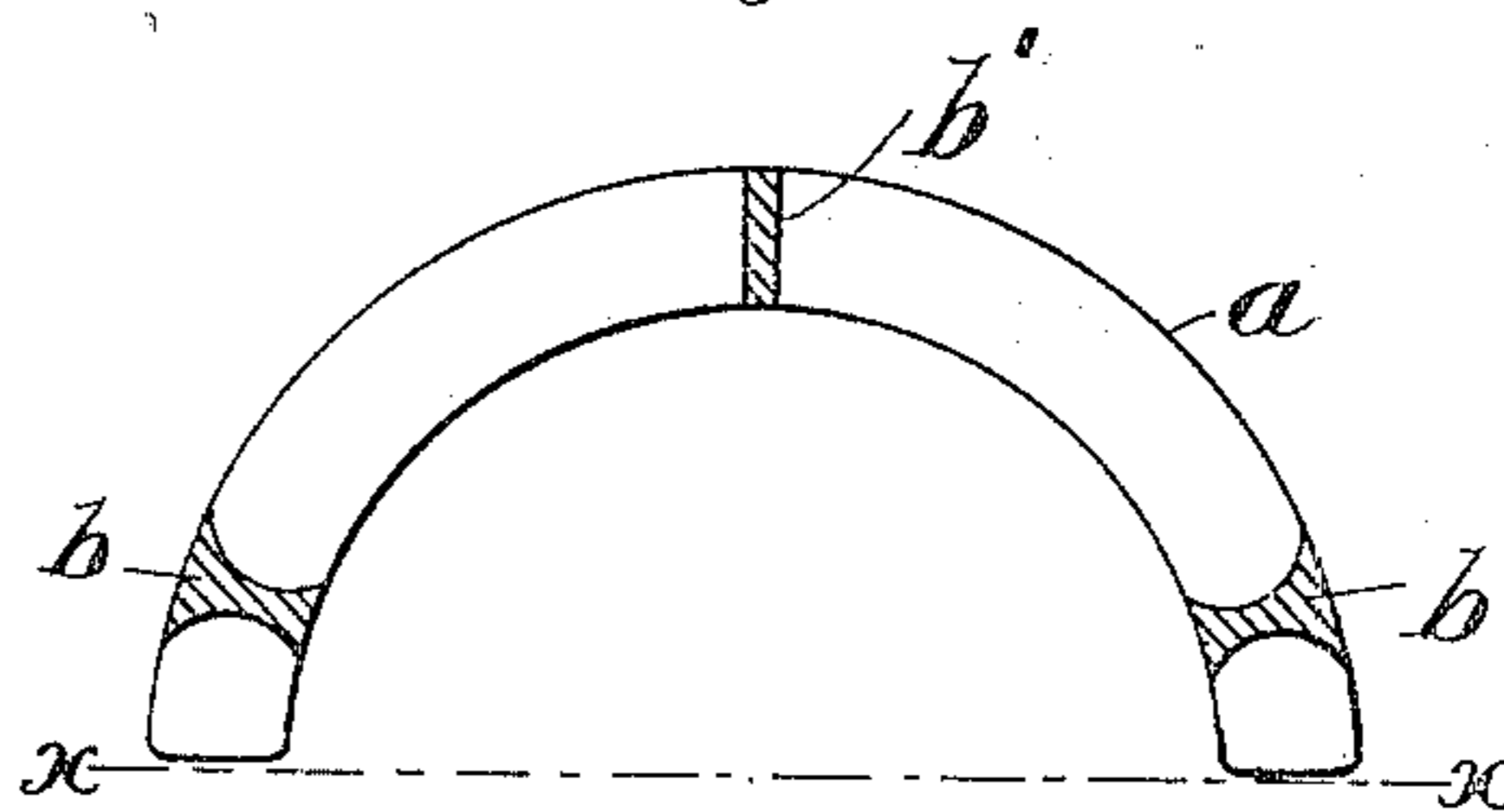
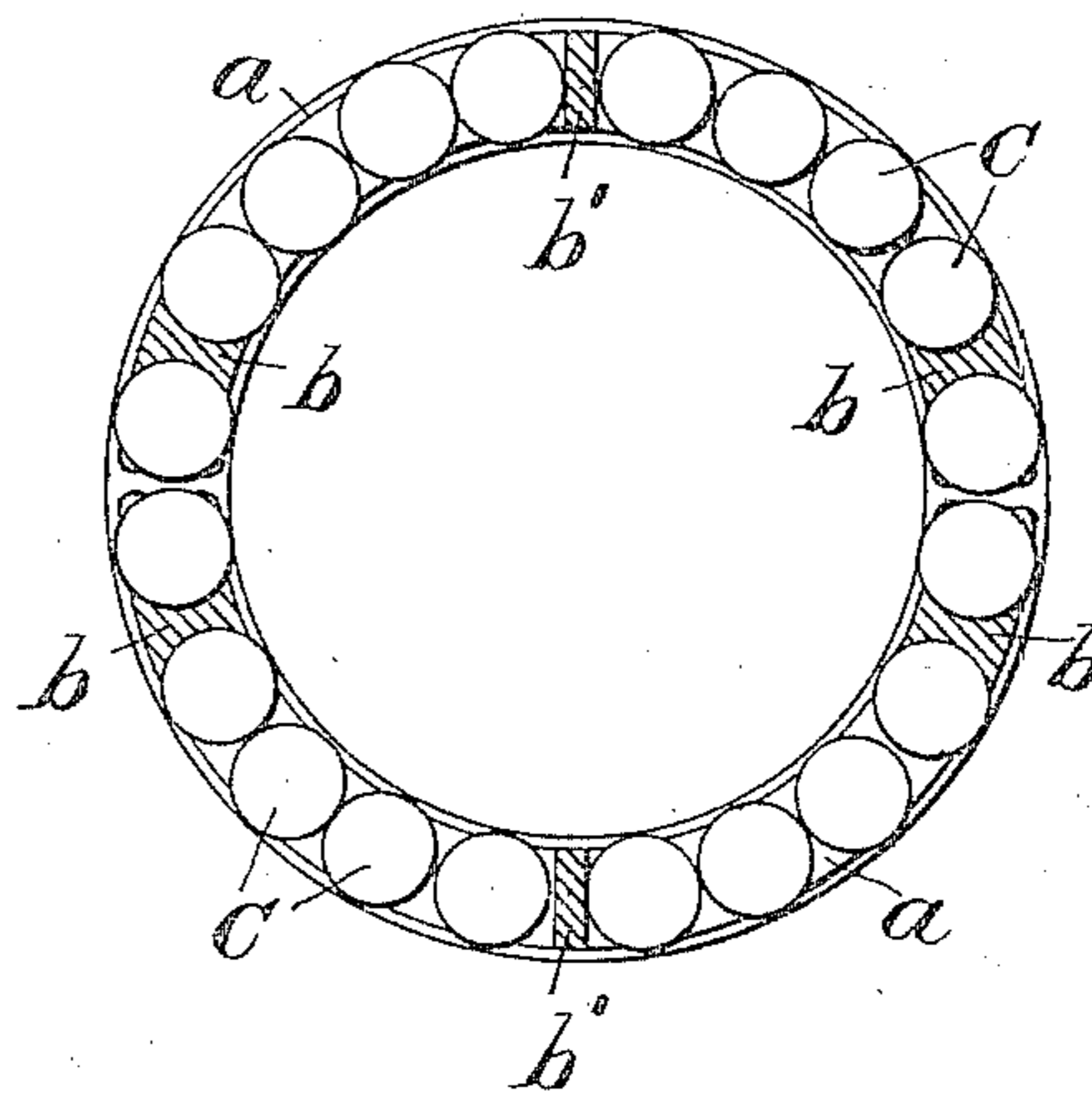


Fig. 7.



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UNITED STATES PATENT OFFICE.

THEODORE J. TELLEFSEN, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE
HYATT ROLLER BEARING COMPANY, OF NEW JERSEY.

GUIDE-FRAME FOR LOOSE ROLLS IN JOURNAL-BEARINGS.

SPECIFICATION forming part of Letters Patent No. 604,572, dated May 24, 1898.

Application filed April 1, 1897. Serial No. 630,330. (No model.)

To all whom it may concern:

Be it known that I, THEODORE J. TELLEFSEN, a citizen of the United States, residing at Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Guide-Frames for Loose Rolls in Journal-Bearings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

It will be readily understood that the most complete support would be furnished to a revolving journal by a large or considerable series of rolls rotating in contact with one another between the journal and casing, as the journal would thus be supported upon numerous lines in the closest proximity to one another that could be secured with rolls of practicable and durable proportions. The rolls in such a loose series are, however, liable to displacement if the journal or casing varies in diameter at any point, and some means is therefore in practice required to hold the rolls parallel. In such bearings it has been common heretofore to use a guide-frame consisting of two parallel bars inserted between the rolls at opposite sides of the journal and connected at their opposite ends by semicircular yokes, the entire guide being carried around the journal within the casing by the rolls. Any tendency of the rolls to oblique displacement operates in reverse directions upon the two guide-bars of such a guide upon which the forces are thus balanced, and the guide is thus enabled to maintain the rolls parallel with the journal if the guide be sufficiently rigid. I have found by experience that where the shaft has a slight taper, as sometimes occurs through wear or by carelessness in manufacture, the tendency of the rolls to an oblique displacement is very considerable, and that such a guide will not resist this tendency unless it is made of steel and of undesirable weight and thickness.

The object of the present invention is to employ a considerable number of the rolls in the series surrounding the journal and to separate as few of the rolls as possible from one another and for as small a space as possible, so as to preserve a nearly continuous support for the journal. Where a single guide-frame

only is used, the rolls upon one side of the journal are of different length from those upon the opposite side, and I avoid this discrepancy and increase the efficiency of the guide, while diminishing the separation of any adjacent rolls, by using two guide-frames, each embracing one-half the circumference of the journal, and the guide-bars may thus be made thinner and the rolls separated in a less degree than where the same work is done by a single guide-frame.

To secure the requisite lightness and rigidity in each guide-frame, I employ between the yokes two lateral guide-bars and one intermediate guide-bar arranged at right angles to the plane of the lateral bars, which secures the utmost stiffness for the amount or weight of metal employed.

To avoid the contiguity of two adjacent guide-bars upon the two guide-frames, which would separate two of the rolls an unnecessary distance, I connect each lateral guide-bar with the yoke at a sufficient distance from the end of the yoke to insert one or two of the rolls between such adjacent guide-bars. None of the rolls in the entire series are thus separated for a greater distance than the thickness of one guide-bar. Where especial firmness is required in the guide-frame, I connect the three guide-bars intermediate to their ends by an auxiliary yoke, which enables me to use shorter rolls in the manufacture of the journal-bearing.

These improvements will be understood by reference to the annexed drawings, in which—

Figure 1 is a side view of the roller-bearing with the casing in section. Fig. 2 is a plan of the same with the cap of the bearing and the upper half of the rolls removed. Fig. 3 is a section of the casing on line 3 3 in Fig. 1, and Fig. 4 is a perspective view of one of the guide-frames. Fig. 5 is a plan of one of the guide-frames; Fig. 6, a transverse section of the same, and Fig. 7 is a similar section of both the guide-frames with the series of rolls which is guided thereby.

A designates the journal of the shaft or axle, supported in the casing B by rolls C. The casing is shown divided diametrically, with its cap attached to the base by lugs B' and bolts B².

The drawings show within the casing at opposite sides of the journal A two similar guide-frames consisting each of the end yokes a , intermediate yoke a' , lateral guide-bars b , and intermediate guide-bar b' . The diametrical ends of the yokes a upon the two guide-frames extend nearly to one another at opposite sides of the journal, so as to embrace the ends of the entire series of rolls and hold them from contact with the heads of the casing, which inclose all the rolls and their guides. The ends of each roll when in motion occupy the same position relative to the contiguous yoke, and thus revolve in contact therewith instead of dragging along the inner face of such heads. Four of the rolls are shown between the guide-bars $b b'$ within each frame, and the guide-bars b are attached to the yokes a at a suitable distance from their diametrical ends to introduce rolls between the adjacent guide-bars of the guide-frames at opposite sides of the journal. The adjacent guide-bars may be so attached to the yokes as to introduce either one or two rolls between the adjacent guide-bars upon the two guide-frames. With a series of twenty rolls the construction shown introduces a group of four rolls between the guide-bars b and b' in each guide-frame and a group of two rolls between the adjacent guide-bars b .

The intermediate yoke a' in each frame is attached to the guide-bars at unequal distances from the opposite yokes a , and in Fig. 1 rolls of corresponding lengths are shown fitted between the intermediate yoke and the end yokes, thus supporting the entire length of the journal, except the small spaces occupied by the yokes. Such a guide-frame as is shown in perspective in Fig. 4 may be readily made all in one piece of steel, iron, or brass by casting in a suitable mold, and where the intermediate yoke is disposed at one side of the middle the frames may be used upon opposite sides of the journal with the effect shown in Fig. 1, where the intermediate yokes appear upon opposite sides of the middle line 3 3, owing to the reversal of position when the yokes are applied at opposite sides of the journal. It is necessary in such a construction that the intermediate yokes should be integral with the guide-bars to secure the necessary strength; but the end yokes may, if desired, be secured to the guide-bars by screws or rivets. Where the spaces at opposite sides of the intermediate yokes are unequal, the entire series of rolls in the casing is formed of two sets of unequal lengths; but the spaces between the long and short rolls in the two frames break joints upon the length of the journal, so that the latter, as well as the casing, is equally worn by the load upon the rolls. By connecting the guide-bars b with the yokes at a suitable distance from the diametrical ends of the yokes the rolls are distributed around the bearing more equably, and the load is thus sustained upon the rolls more uniformly than if the two guide-

bars b were made contiguous to one another upon the diametrical ends of the yokes.

In Fig. 5 the guide-frame is shown with the three guide-bars $b b b'$ connected to yokes at their ends only, and in Figs. 6 and 7 the ends of the yokes are shown extended somewhat beyond the lateral bars b , thus admitting a roll between the opposite yokes beyond each of the lateral bars b and securing a uniform length for all the rolls in the series, which simplifies the construction materially. The yokes heretofore used, consisting merely of two guide-bars and two yokes, could be stiffened only by increasing the thickness or weight of such bars or yokes; but I find that a much greater degree of stiffness is secured for the guide-frame by disposing the same amount of metal in three of the yokes connected by three of the guide-bars.

To separate the rolls as little as possible, and thus preserve the bearing of the journal, the guide-bars are made quite thin between the adjacent sides of the rolls, and the lateral guide-bars have thus very little stiffness in their common plane, which is nearly diametrical to the guide-frame.

The lateral bars may be formed by casting with concave sides, as shown in the drawings, which thickens them at the edges, and thus increases their stiffness in some degree.

In making the guide-frame integral by casting the central bar b' cannot be molded if it is hollowed in like manner upon the sides, as it must be drawn from the mold edgewise or radially, and it is therefore shown of rectangular cross-section; but its relative position places it at right angles to the thickness of the lateral guide-bars, in which position the metal of the intermediate guide-bar imparts many times more stiffness to the frame than it would if applied merely to increase the thickness of the guide-bars b . The disposal of the intermediate flat guide-bar b' at right angles to the common plane of the lateral guide-bars and to their thickness is thus especially effective in increasing the stiffness of the guide-frame, and the addition of the intermediate yoke a' also serves to increase the stiffness of the frame much more than the addition of similar weight to the end yokes, as it greatly shortens the length of the guide-bars between the adjacent yokes.

I have found in practice that the guide-frames thus constructed operate most effectively to keep the rolls from any oblique displacement within the casing, and thus enable the roller-bearing to operate with less friction, less wear, and less noise.

Having thus set forth the nature of the invention, what I claim herein, is—

1. In a roller-bearing, the combination, with the journal, the casing, and a considerable series of rolls C arranged in groups around the journal within the casing, of two similar guide-frames consisting each of the semicircular yokes a connected by the guide-bars b and b' arranged as shown and described, the

lateral guide-bars b being each set at a short distance from the end of the yoke for the purpose set forth, and a group of the rolls in contact with one another being fitted between
5 the guide-bar b' and each of the lateral bars b and other rolls being fitted between the adjacent guide-bars b upon the two guide-frames, substantially as herein set forth.

10 2. In a roller-bearing guide-frame having semicircular yokes connected by guide-bars with groups of rolls in contact between such bars, the combination, with the three yokes a, a, a' , of the guide-bars b, b and b' arranged as shown and described, with the guide-bar

b' connecting the centers of the yokes, and 15 the lateral guide-bars b connected to the yokes at a suitable distance from the ends of the same, to admit one of the rolls between the opposite yokes, beyond each lateral guide-bar, substantially as herein set forth. 20 .

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THEODORE J. TELLEFSEN.

Witnesses:

P. S. STEENSTRUP,
THOMAS S. CRANE.