

(No Model.)

2 Sheets—Sheet 1.

T. C. LEWIS.
BALL BEARING.

No. 580,498.

Patented Apr. 13, 1897.

FIG. 2.

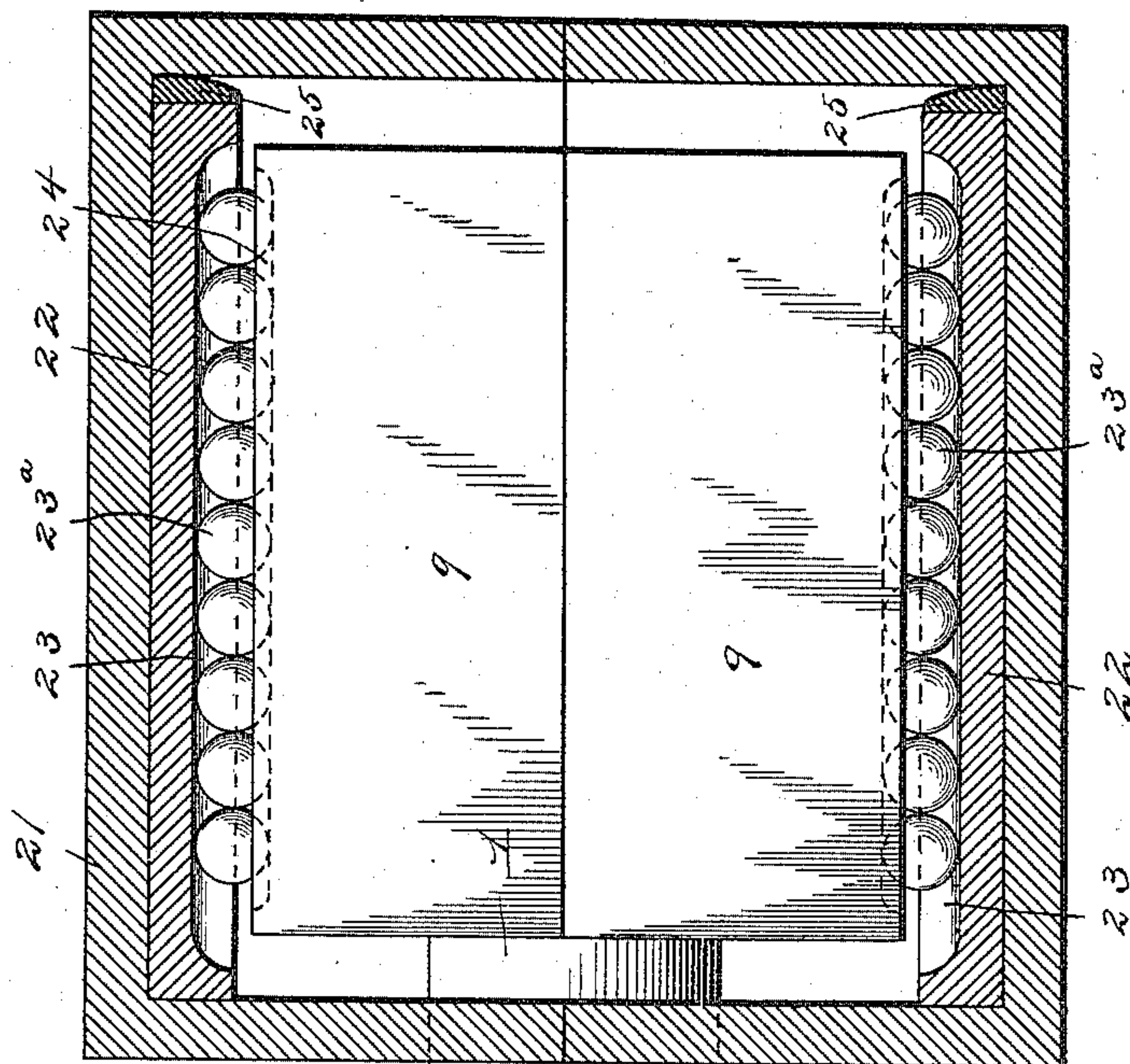
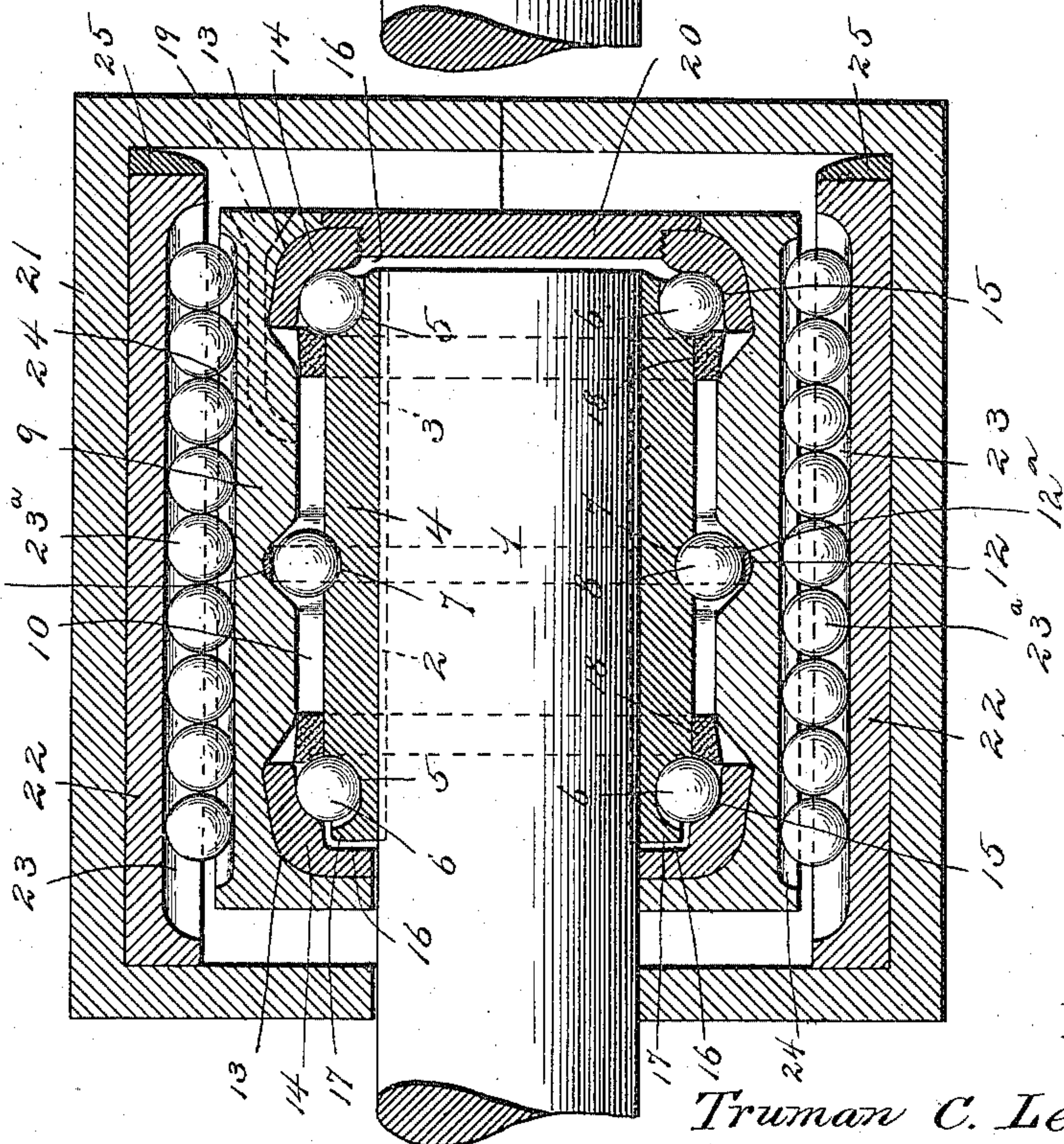


FIG. 1.



Inventor

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Witnesses

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FIG. 4.

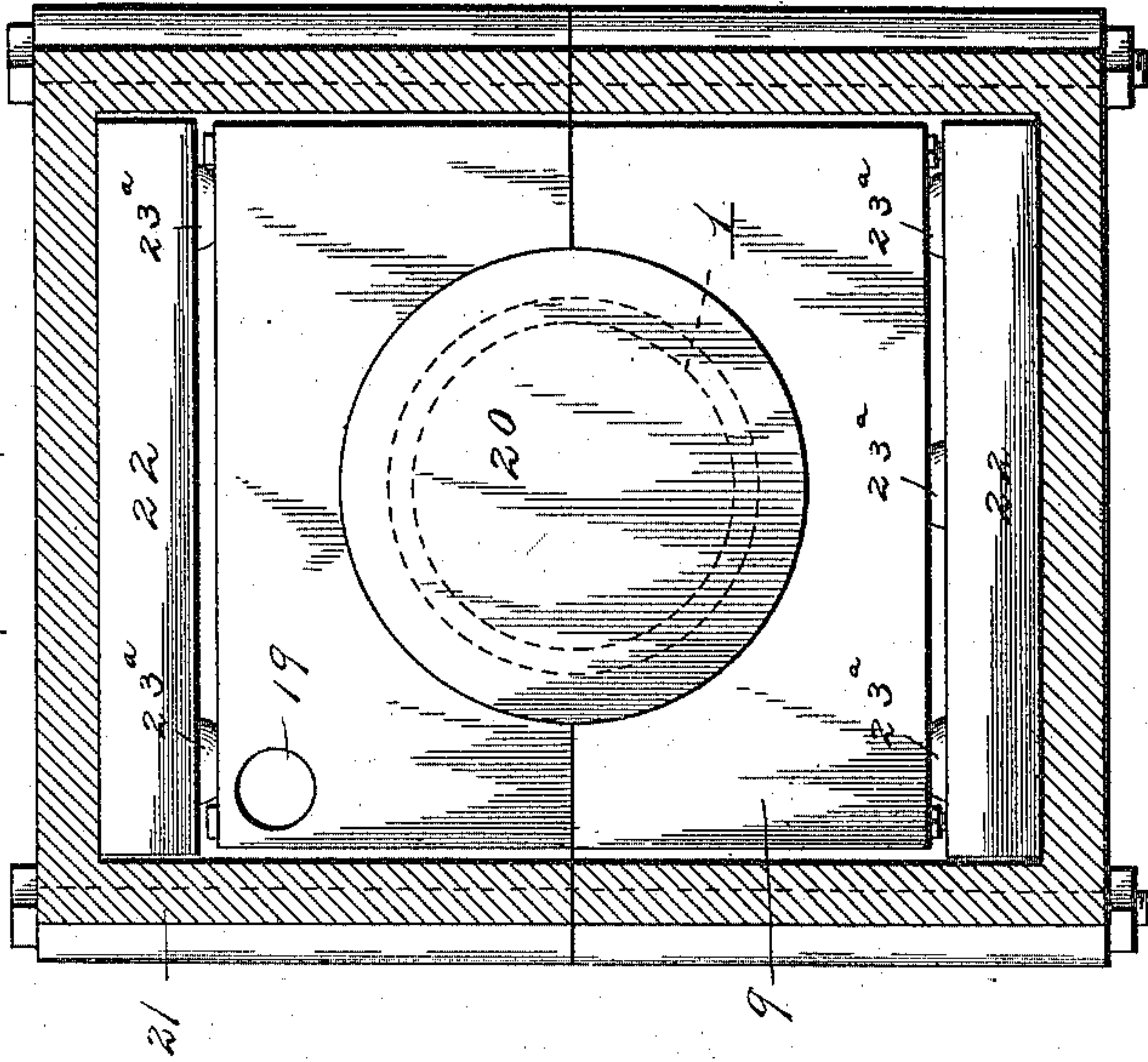


FIG. 5.

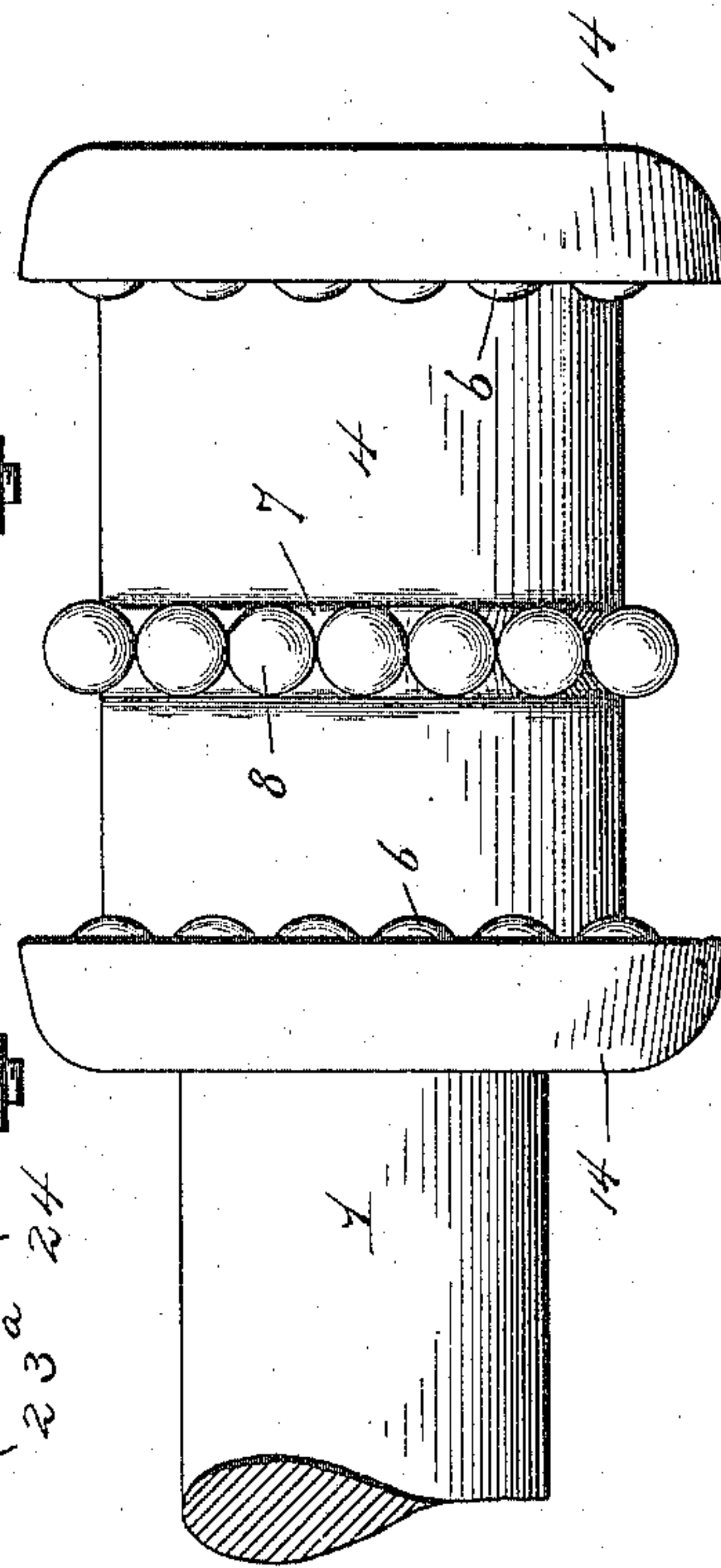
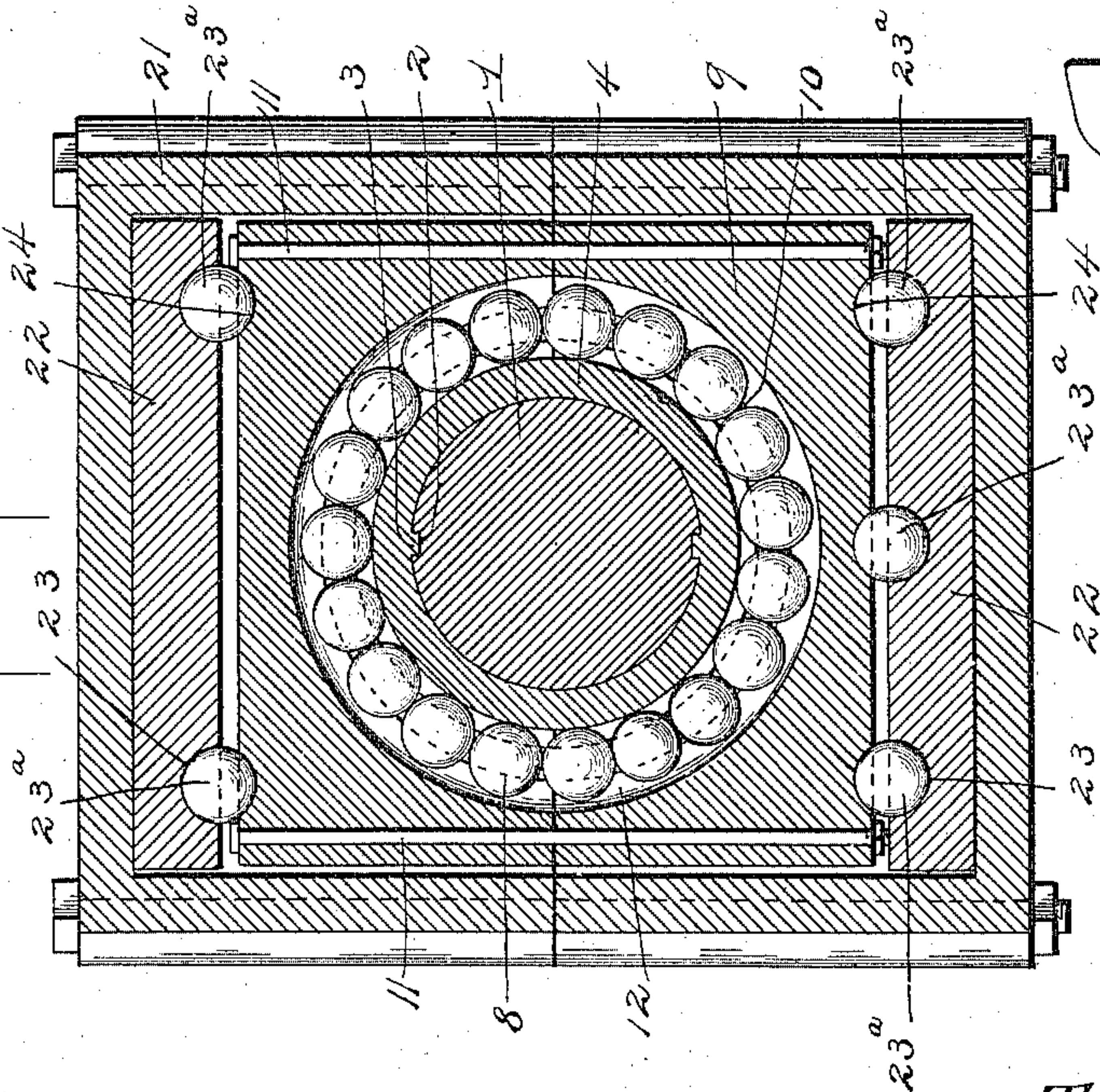


FIG. 5.

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UNITED STATES PATENT OFFICE.

TRUMAN C. LEWIS, OF MARION, OHIO.

BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 580,498, dated April 13, 1897.

Application filed June 27, 1896. Serial No. 597,199. (No model.)

To all whom it may concern:

Be it known that I, TRUMAN C. LEWIS, a citizen of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented a new and useful Ball-Bearing, of which the following is a specification.

This invention relates to ball-bearings, and has for its object to provide a bearing of this character which is especially adapted to be used in railway-car journal-boxes for overcoming the friction and preventing the heating of the journal, also saving the expense of brasses, packing, &c., avoiding delay and enabling greater tonnage to be handled with the same amount of power.

To this end the invention consists in certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through a journal-box constructed in accordance with the present invention. Fig. 2 is a similar view showing the inner box in elevation. Fig. 3 is a cross-section through the journal-box. Fig. 4 is an elevation of the outer end of the box, showing the outer casing in sections. Fig. 5 is a plan view showing the collar surrounding the journal, the balls, and the ball-cups.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

The improved bearing contemplated in the present invention is designed to be used in connection with the ordinary journal-box casing in use at the present time and is intended to be substituted in lieu of the usual brasses and packing, &c., although, if desired, a new casing may be employed.

Referring to the drawings, 1 designates the journal of a car-axle, which, for the purpose of carrying out the present invention, is longitudinally grooved, as at 2, to receive ribs or keys 3 upon the inside of a bearing sleeve or collar 4, fitting closely around the journal. The sleeve 4 thus keyed to the journal is provided at each end with an annular groove 5, such grooves forming ball-races in which circular series of antifriction-balls 6 travel.

Intermediate its ends the sleeve 4 is provided with one or more additional grooves, forming ball-races 7 for another or other series of antifriction-balls 8.

9 designates what may be termed an "inner bearing-box," which is provided with a cylindrical bore and which surrounds the sleeve 4, so as to leave an intervening space 10, the purpose of which will appear. This box is formed in two halves or sections, which meet upon the diametrical line of the journal and are connected and held firmly to place by means of bolts 11, passing through corresponding openings in the said halves or sections, and being adjustable by tightening or loosening the sections by means of the said bolts. The box 9 is provided upon the inside with an annular groove or ball-seat 12 for antifriction-balls 8, said groove containing a steel band 12^a, which extends around the balls and against which said balls travel, and the opposite ends of said box, which overlap or extend beyond the corresponding ends of the sleeve 4, are provided with internal annular recesses 13, in which are received the peripheral portions of ball-cups 14.

Each of the ball-cups 14 is annular in form, having an open center, the opening in outer cup 14 containing a disk or plug 20, while the inner ball-cup 14 closely embraces the journal to prevent ingress of foreign matter and is grooved, as at 15, to form an annular seat or race for the balls 6. The bearing or touching points between the balls 6 and the sleeve 4 and between said balls and cups 14 are arranged upon an oblique line, so that while said balls take the weight placed upon the journal-box they also prevent the sleeve 4 from contacting with the cups 14 at each end, a space 16 being always preserved between the ends of the sleeve 4 and said ball-cups. At its inner end the sleeve 4 is extended to form a circumferential flange 17, lying inside of the balls and serving to prevent the admission of dust, dirt, and foreign matter thereto. One or more annular pads or oil-conductors 18 surround the sleeve 4 inside of the box 9 and lie adjacent to the balls, said pads serving to take up the oil within the space 10, which forms an oil-receptacle, and conduct the same to and distribute it evenly upon such balls. The lubricant is supplied to the space

10 through an opening 19 in the outer end of the box 9, adjacent to one of its upper corners. The box 9 at its inner end has a central opening which snugly receives the journal and is also provided with a somewhat larger opening in its outer end. A removable disk or plug 20 is screwed into the central opening in the outer ball-cup 14 for rendering the outer end of the bearing dirt-proof. This disk or plug may be quickly removed for giving access to the balls and journal.

The outer case 21 of the journal-box may be of any ordinary form, but is preferably constructed in two parts and bolted together, which facilitates the casting of the same and the inclusion of the inner box 9.

22 designates a pair of bearing-plates arranged inside and at the top and bottom of the casing 21. These bearing-plates about correspond in dimensions to the top and bottom of the casing 21 and are provided upon their adjacent faces with longitudinal grooves 23, in which are placed longitudinal series of antifriction-balls 23^a, said balls also traveling in longitudinal grooves 24 in the top and bottom walls of the inner box 9, which is approximately square or rectangular in cross-section upon the outside.

One, two, or more rows of balls may be employed at both the top and bottom of the inner box 9, and provision is thus made for the end thrust of the axle-journal, caused by the car suddenly striking a curve.

Suitable stops or lugs 25 upon the inside of the outer casing 21 may be employed to hold the plates 22 in their proper position.

From the foregoing description it will be seen that by making inner box 9 in two sections or halves when the same are brought together they will embrace the ball-cups 14 and hold the same in place, thus avoiding the necessity for screw-threading the parts.

It will also be seen that the journal is mounted on balls within the inner box and that the latter in turn is supported upon balls within the outer casing. The inner box admits of the free rotation of the journal with a minimum amount of friction, and said box is also adapted to slide bodily and longitudinally within the outer casing for accommodating end thrust. This greatly reduces the draft of a train of cars. A limited supply of oil will last a long period of time, as it is kept clean, and the admission of foreign matter to the bearing will be to a great degree prevented.

It will be understood that the several parts of the bearing are susceptible of changes in the form, proportion, and minor details of construction, which may accordingly be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. The combination with a journal and an outer case inclosing the journal, of a bearing-sleeve made fast on the journal and provided

at its opposite ends with ball-races, an inner bearing-box surrounding the sleeve and having closed end portions and a series of longitudinal grooves formed respectively in the exterior upper and lower faces thereof, said inner bearing-box lying entirely within the outer case and shorter in length than the latter to permit of the relative longitudinal play of the box and case, separate ball-cups arranged entirely inside of the inner bearing-box within the closed end portions thereof, bearing-balls interposed between the ball-cups and the adjacent races of the bearing-sleeve, bearing-plates fitted within the top and bottom of the outer case and provided with a plurality of longitudinal grooves arranged opposite the corresponding grooves of the inner bearing-box, and antifriction-balls arranged in said longitudinal grooves, substantially as set forth.

2. The combination with a journal and an outer case inclosing the same, of a bearing-sleeve made fast on the journal and provided at each end with annular ball grooves or races, the inner end of the sleeve being extended to form a circumferential flange, an inner bearing-box supported within the outer case, annular ball-cups fitted within the ends of the inner bearing-box and having their grooved faces opposed to the adjacent grooves or races in the ends of the sleeve, the inner of said ball-cups overlapping the adjacent circumferential flange of the sleeve, a disk or plug removably fitted in the opening of the outer ball-cup beyond the end of the journal, and a circular series of bearing-balls arranged in the races provided therefor at the ends of the sleeve, substantially as set forth.

3. The combination with a journal, of a sleeve made fast on the journal and provided at its ends with ball-races, a bearing-box inclosing the sleeve and carrying within its ends ball-cups lying opposite said ball grooves or races, said bearing-box being pierced at one end by a lubricating-opening communicating with the space between the sleeve and the box, a circular series of bearing-balls arranged in the races at the ends of the sleeve, and annular oil-conducting pads encircling the sleeve and resting at one edge against the bearing-balls in the oppositely-located races, substantially as set forth.

4. The combination with a journal, of a bearing-sleeve fast thereon and provided at each end with ball-races, annular ball-cups opposing said races, antifriction-balls therein, and a box surrounding said sleeve and provided with annular recesses at each end and at an intermediate point, the end recesses being adapted to embrace and hold the ball-cups in place, and the intermediate recess being provided with a band extending entirely around it and forming a bearing for an intermediate series of balls, said box being also formed in separable sections adjustable relatively to each other, substantially as described.

5. The combination with a journal, of a bearing-sleeve made fast on the journal and provided at its ends with ball-races, a bearing-box surrounding the sleeve and provided with closed end portions and with an interior annular groove intermediate of its ends, ball-cups arranged within the closed end portions of the bearing-box, bearing-balls arranged in the races therefor at the ends of the sleeve and bearing-box, a metallic band extending entirely around the intermediate groove of

the bearing-box, and separate series of intermediately-located balls working in said intermediate groove against the metallic band therein, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

TRUMAN C. LEWIS.

Witnesses:

S. S. FOX,

H. EDMUND HILL.