

(No Model.)

2 Sheets—Sheet 1.

E. W. COOKE.
CAR AXLE BOX AND JOURNAL BEARING.

No. 442,354.

Patented Dec. 9, 1890.

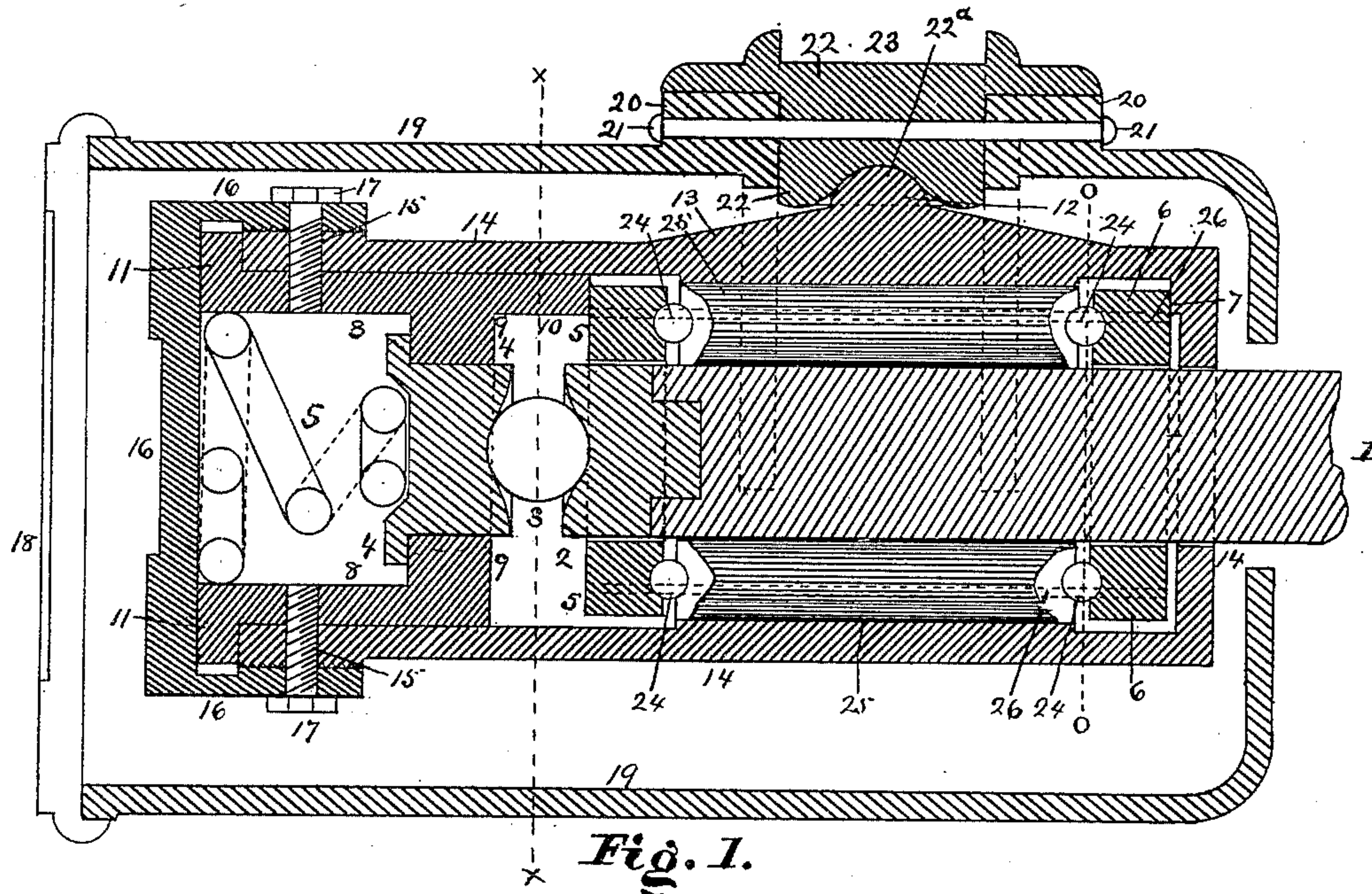


Fig. 1.

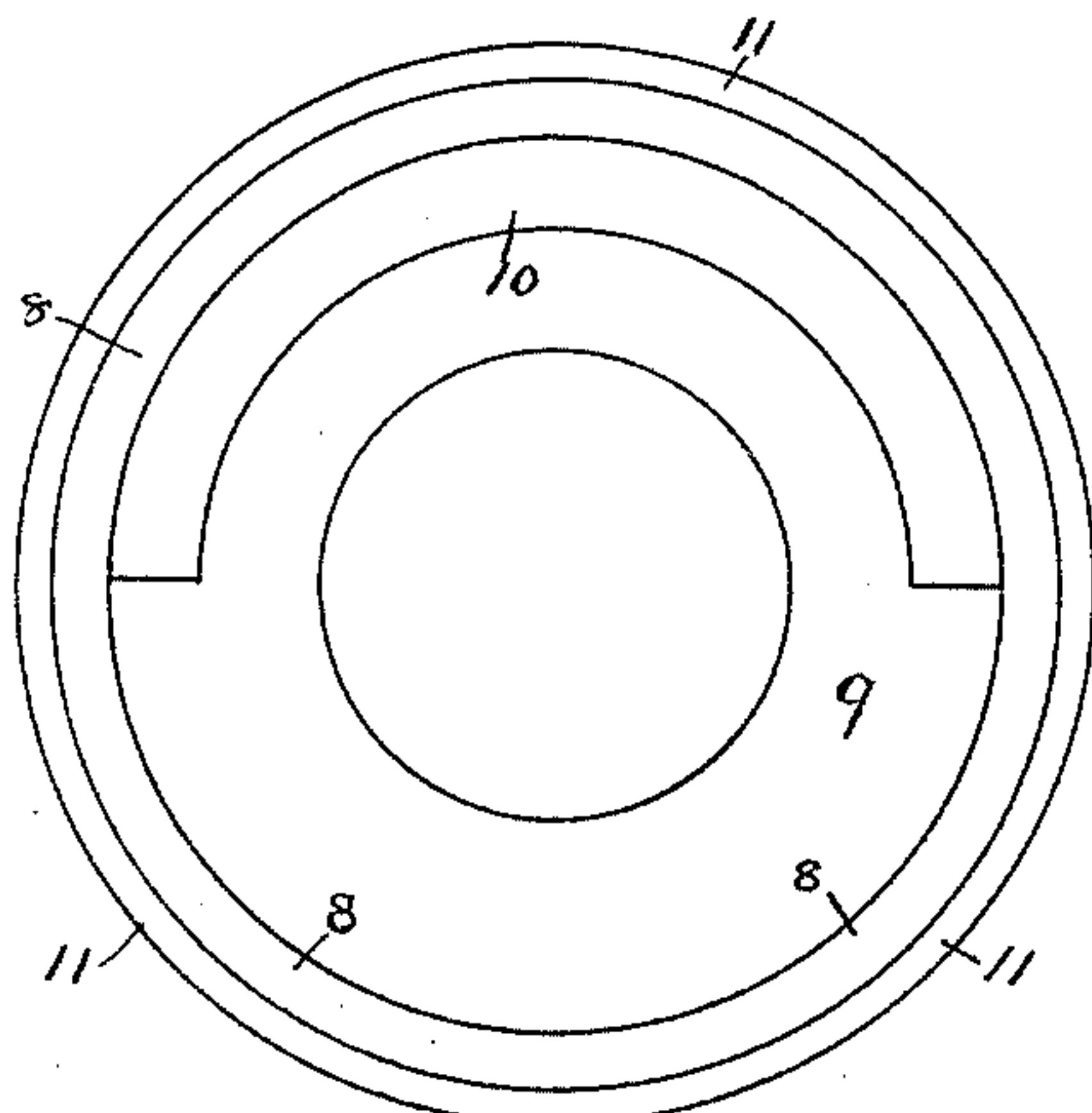


Fig. 2.

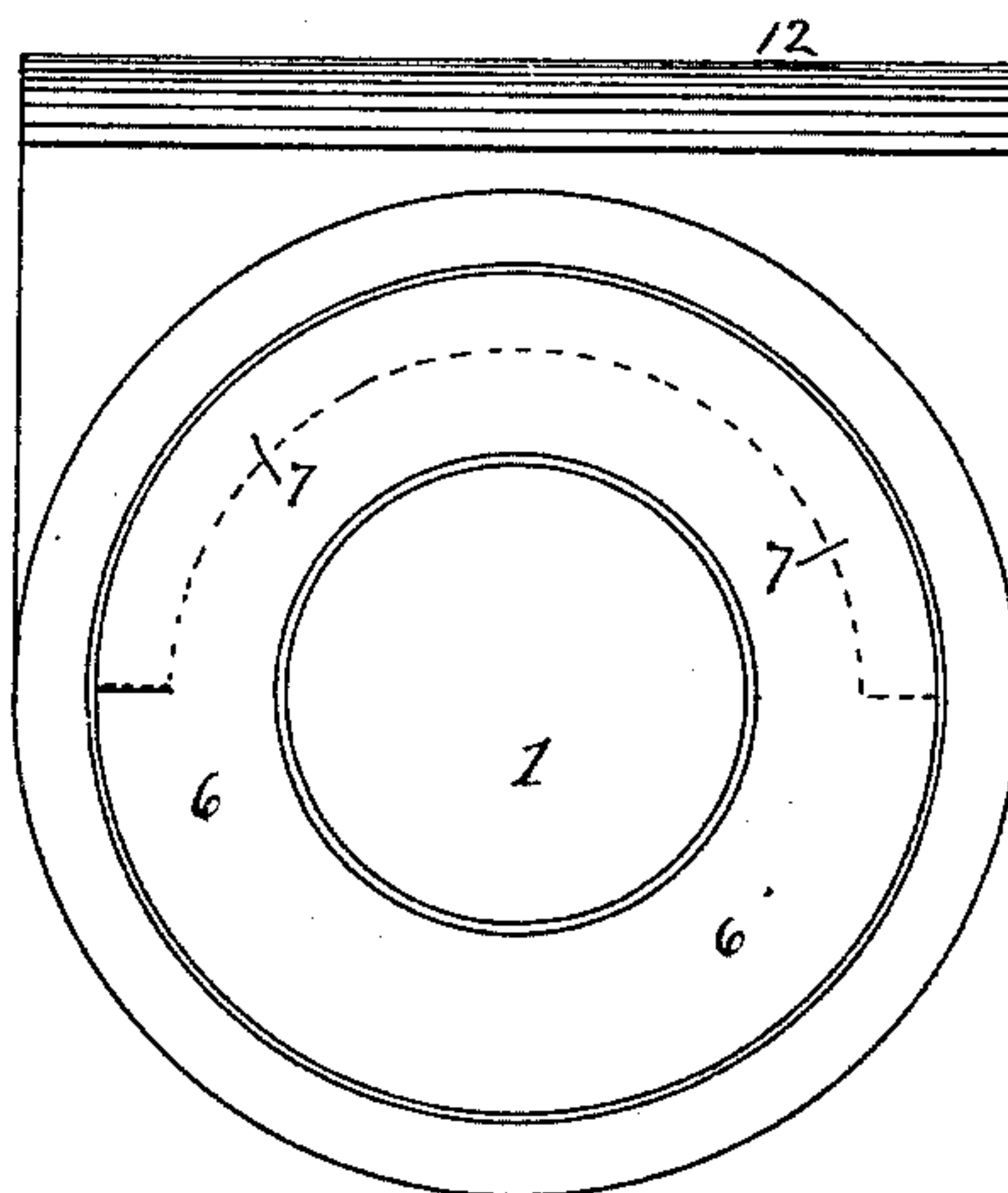


Fig. 3.

Witnesses:

J. M. Alister
E. D. Ayle.

Inventor:

E. W. Cooke

Alfred Brothman

ATTORNEY.

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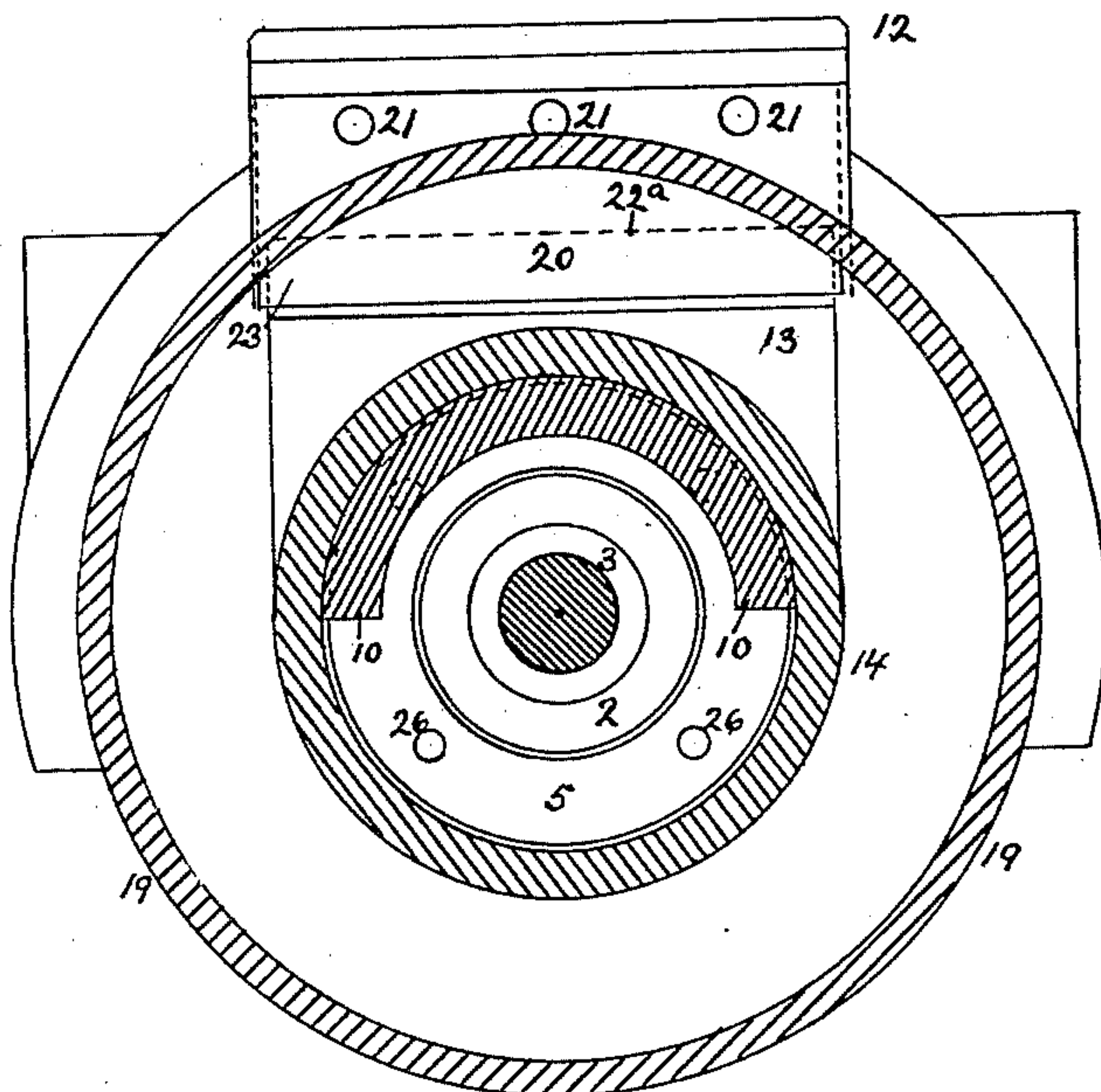


Fig. 4.

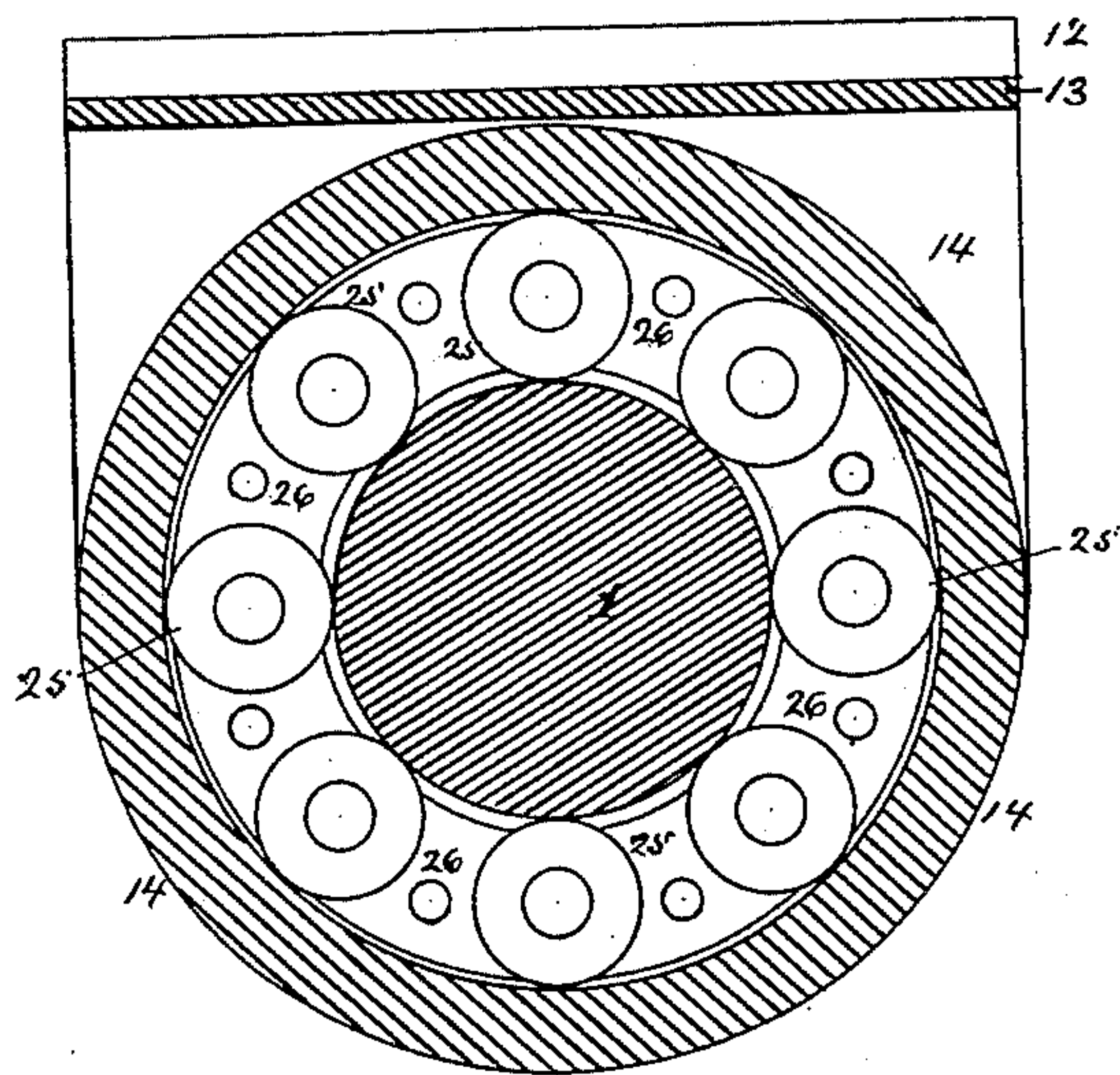


Fig. 5.

Witnesses:

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Inventor:

Ernest W. Cooke
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UNITED STATES PATENT OFFICE.

ERNEST WM. COOKE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE AMERICAN ROLLER BEARING COMPANY, OF SAME PLACE.

CAR-AXLE BOX AND JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 442,354, dated December 9, 1890.

Application filed January 13, 1890. Serial No. 336,834. (No model.)

To all whom it may concern:

Be it known that I, ERNEST WM. COOKE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Car-Axle Boxes and Journal-Bearings, of which the following is a specification.

My invention relates to car-axle boxes and journal-bearings, in which a series of rollers held by a cage of collars are supported in an axle-box having a fulcrum-plate on the upper surface of the said box, and in which said cage rotates the axle carrying the car-wheel, the end-thrust being overcome by a ball running in a pit in the center of the axle and playing in a pit in the end of a plug held in juxtaposition with the ball by a spiral spring and the end of the said box.

My object in this invention is to provide a means for taking up the end-thrust and lateral motion in an axle-box and to give free motion to the revolution of the axle. I attain this said object by means of the mechanism shown in the accompanying drawings, in which—

Figure 1 is a vertical section in the median line. Fig. 2 is an end view of the sleeve 8. Fig. 3 is a view of the fulcrum 12 and rear end of the box 7 and collar 6. Fig. 4 is a vertical sectional view in the line xx . Fig. 5 is a sectional view of the box-bearing 13 and the cage, with the rollers in the cage.

Similar figures refer to similar parts throughout the several views.

I make an axle 1 and turn it down to a uniform size. On the remote end I make a mortise, and in this fit a cap of hardened metal 2. The said cap 2 is provided with a pin that fits in the mortise of the axle and in the center of the cap 2, and therefore in the center of the axle I make a pit with sloping sides, in which plays a metallic ball 3. The sides of this pit are so beveled that the ball may shift its position, and by the approaching of the pits in the cap 2 and cap 4 the ball will regain and maintain the position in the central line. I make a cap or plug 4, which has on the end nearest the ball 3 a pit with sloping or beveled sides similar to

that in the cap 2 to retain the ball 3, as set forth. The plug 4 is made of sufficient size and of a cylindrical shape to pass through a collar 9 on the inner side of the sleeve 8. On the outer side of the plug 4 is a depression of a circular shape and having flared sides, in which depression rests an end of a spiral spring 5. The outer end of the spiral springs 5 rests against the inner face of the cap 16, which said spring 5 with its outer or larger coil fills the end of the sleeve 8. The sleeve 8 is of a cylindrical form, having the outer end provided with a flange or collar 11, and on the inner surface is the collar 9, which contracts the sleeve for the plug 4 beyond the plug 4. One half or portion of the sleeve is removed, preferably the lower half, and the upper half is extended, as at 10, till it touches the collar 5 of the cage.

About the sleeve 8 and axle 1 I make a sleeve 14. The outer end of this sleeve 14 is drilled with a hole 15, and a screw-thread cut in the same for the screw 17, which passes through the cap 16, which is secured to sleeve 14 and sleeve 8 and binds them all together. At the end of the sleeve 14 farthest from the screw 17 I bore out the core and drill a hole for the passage of the axle 1, which closely fits the hole in the sleeve 14. In this core in the sleeve 14 I make a semicircular lug 7, running about the upper half of the end of the sleeve 14, and against which plays the collar 6 of the roller-cage. The central part of the sleeve 14 is cored out to accommodate the cage of rollers 25 25. On the top of the sleeve 14, at a convenient point, I thicken up the wall and on the summit make a cylindrical fulcrum 12.

Within the core of the sleeve 14 I make a collar 5 and a collar 6, which are smaller in diameter than the core of the said sleeve 14, and between these collars 5 and 6 I make a series of cylindrical rollers 25. The collars 5 and 6 have on the inner sides of each, respectively, a spherical pit which carries a hardened metallic ball 24, and upon these balls 24 is pivoted the roller 25, the said balls resting in spherical pits in the center of the roller, the collars 5 and 6 being fastened together to form a cage by the rods 26 26.

The outer faces of the collars 5 and 6 rest, respectively, against the end of the sleeve 8 at 10 as to collar 5 and against the lug 7 on the sleeve 14 as to collar 6.

5 Without the sleeve 14 I make a sleeve 19, which, with the cap 18, covers in the end of the axle and bearing, and within which the journal-box is free to move. At a convenient point in the sleeve 14 I make a mortise and
10 thicken up the sides of the said mortise, and into the mortise I fit the metal bearing-plate 22, and on the underside of the bearing-plate 22 I make a cylindrical groove with raised edges 22^a, which edges partially embrace the
15 fulcrum 12 of the sleeve 14. The top of the bearing-plate 22 is depressed, as at 23, to receive the timbers of the car-truck. The bearing-plate 22 is secured to the sleeve 19 by means of the bolts 21 21.

20 Having now described the parts of my invention, I proceed to explain the method of operating the same: The parts are put together in such a manner that the fulcrum 12 rests in the groove 22^a. The rollers are
25 within the core of the sleeve 14, the collar 6 resting against the lug 7, the collar 5 resting against the sleeve 10, the sleeves 8 and 14, with the cap 16, being secured together by the screws 17, the spiral springs 5 being
30 within the end of the sleeve 8 and the plug 4 within the collar 9, the ball 3 being in the pits on the end of the axle 1 and the plug 4, the bearing-plate 22 being bolted to the sleeve 19 and the cap 18 secured to the said sleeve 19, the
35 end of the axle 1 entering the hole in the rear end of the sleeve 19. When thus arranged and the unoccupied space about the different parts is filled with a fusible lubricant, the axle 1 will revolve in the cage on the rollers.
40 25 and have an unobstructed motion from end to end, except at the extreme end of the axle, where it comes in contact with the metallic bolt 3, and this is held by the pit in the plug 4, which is kept against the bolt by the
45 recoil of the spring 5, so that any change in the longitudinal position of the axle 1 is accommodated and adjusted by the springs 5 at either end of the axle, and thus any end-thrust is taken up. I also accommodate or
50 provide for any unequal rise or fall in the position of the box by the fulcrum 12, which permits of the swing of the box in the socket 22^a, but at the same time holds the box in a firm position.

55 I am aware that anti-friction journal-boxes and axle-bearings are not new in the broad sense, and I do not, therefore, claim a "car-axle box and journal-bearing" in the broad sense; but

60 What I do claim, and desire to secure by Letters Patent, is—

1. In a car-axle box and journal-bearing, the combination of an axle having an unobstructed lateral motion, having a hardened
65 metallic cap in the end of the axle fitted to receive a metallic ball in the center of the axle, and which said ball acts as the pivot for

the support of the said end of the axle, the said ball rolling in a pit in the end of a plug held by a collar on the inside of a sleeve secured to the sleeve which carries the rollers and cage, and which said plug and ball are kept in position against the end of the axle by the spiral spring within the said sleeve holding the said plug and secured within the said sleeve
70 by a cap secured by the screw, with a fulcrum on the upper surface of the sleeve carrying the said rollers, combined with a bearing-plate having a semi-cylindrical groove in which plays the said fulcrum of the said
75 exterior sleeve, the said bearing-plate being bolted to the said sleeve by the bolts, all as and for the purpose substantially as set forth and described.

2. In a car-axle box and journal-bearing, the combination of a sleeve carrying a series of rollers contained in a cage, and which said rollers are pivoted to a series of collars at either end of the cage by means of metallic balls, the said sleeve having on its upper surface a fulcrum, combined with a bearing-plate having a longitudinal groove in which the fulcrum rests, the said bearing-plate being secured to the external sleeve of the axle-box carrying the timbers of the truck, all substantially as and for the purpose set forth and described.

3. In a car-axle box and journal-bearing, the combination of a cylindrical sleeve having a collar on the inner surface and having the outer end flanged, with a semicircular lug on the inner end bearing against the collar of the roller-cage, combined with a plug passing through the center of said sleeve carrying a pit in the central line supporting a ball and held in place by a spiral spring, all as and for the purposes set forth and described.

4. In a car-axle box and journal-bearing, the combination of an axle having a sloping spherical pit in the end of said axle, combined with a metallic ball rolling in said pit and held in place by a similar pit in the end of a plug in a line with the center of the said axle and a spring back of the said plug to maintain the plug in contact with the said ball, all substantially as and for the purpose set forth and described.

5. In a car-axle box and journal-bearing, the combination of a cap secured by screws to the end of a sleeve which forms a cavity in which is held a spiral spring, with a plug having a flared edge on the inner side and a sloping spherical pit on the outer side, combined with a metallic ball and axle, in the center line of which the ball revolves in a pit, all substantially as and for the purpose set forth and described.

6. In a car-axle box and journal-bearing, the combination of a cap screwed to the end of a sleeve, having a constricted collar on the inner side and a flange on the outer side with a semicircular lug, the central cavity of which sleeve being occupied with a spiral spring and a plug moving horizontally in the collar, said

plug being pitted in the median line, combined with a ball of metal rolling in a similar pit in the central line of an axle, which said axle is kept in contact with its said ball-bearings by means of the said spiral spring, all as and for the purpose set forth and described.

7. In a car-axle box and journal-bearing, the combination of a sleeve containing a series of rollers and balls united in a cage by a series of collars, a sleeve carrying a pitted plug and spiral spring with a cap to secure the same, the said roller carrying an axle, and the said sleeve having a fulcrum on the upper surface, combined with a bearing-plate in the side of an encircling sleeve, which said bearing-plate is bolted to the said encircling sleeve, and within which sleeve the sleeve

carrying the fulcrum has free swinging motion in a vertical line, all substantially as and for the purpose set forth and described.

8. In a car-axle box and journal-bearing, the combination of an axle revolving within an axle-box, combined with a tightly-fitting sleeve containing the rollers and end bearings, and which said sleeve may be filled with a fusible lubricant, which the tight-fitting of the sleeve about the axle will not allow to escape, all as and for the purpose substantially as set forth and described.

ERNEST WM. COOKE.

In presence of—

T. MCALLISTER,
E. D. AGLE.