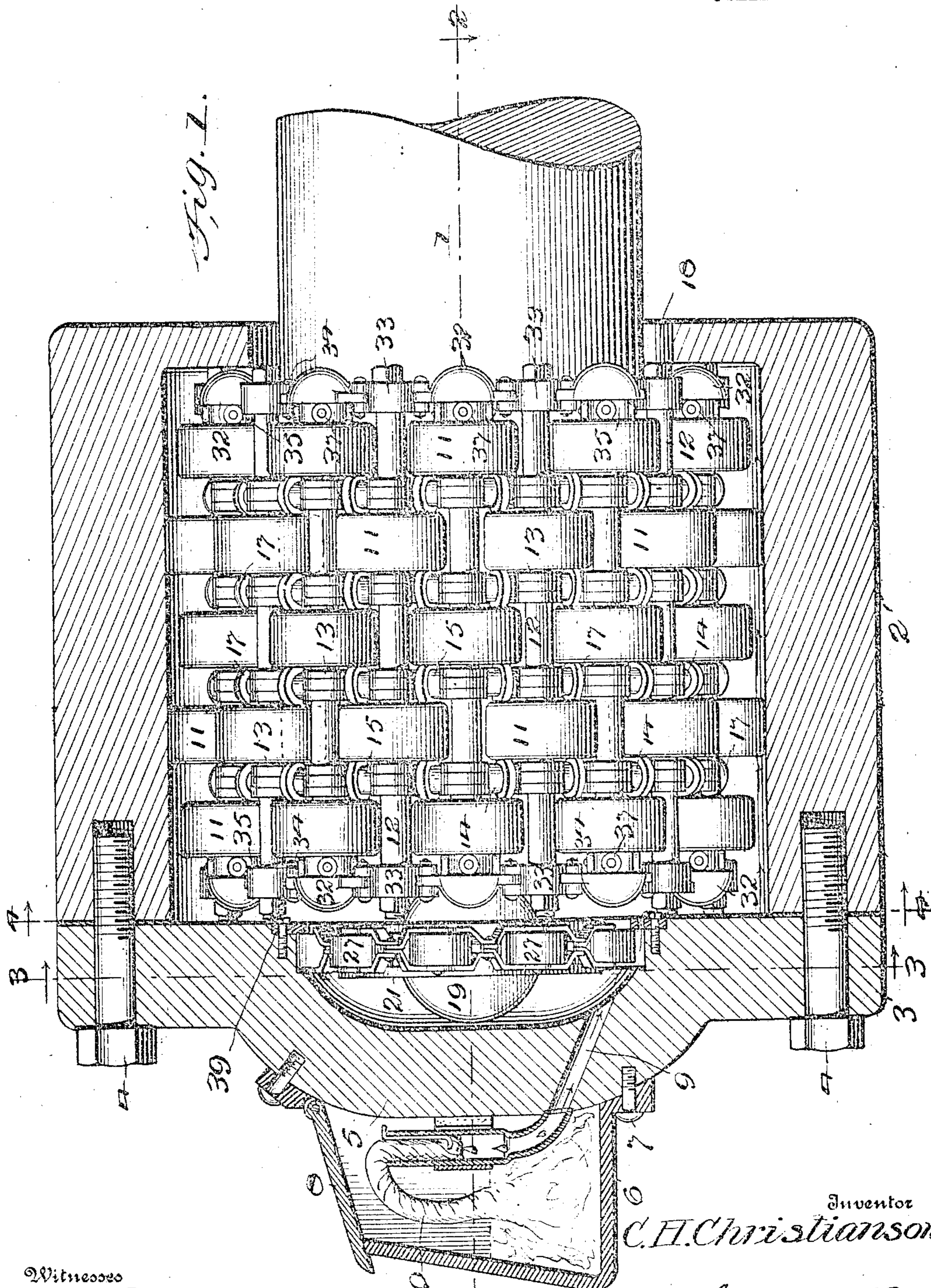


No. 788,020.

PATENTED APR. 25, 1905.

C. H. CHRISTIANSON.
ANTIFRICTION BEARING.
APPLICATION FILED AUG. 12, 1904.

4 SHEETS—SHEET 1.



Witnesses

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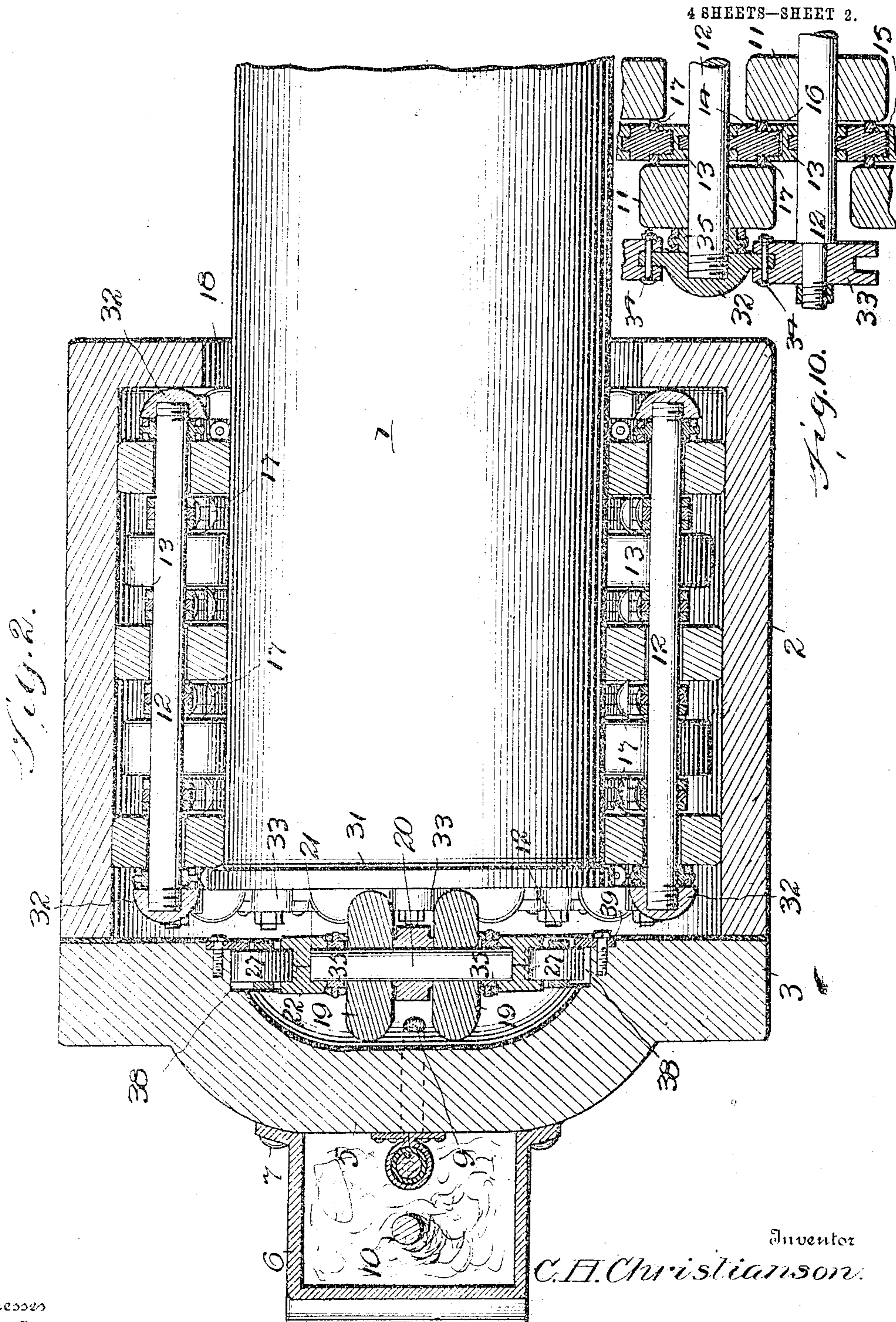
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48 SHEETS—SHEET 2.



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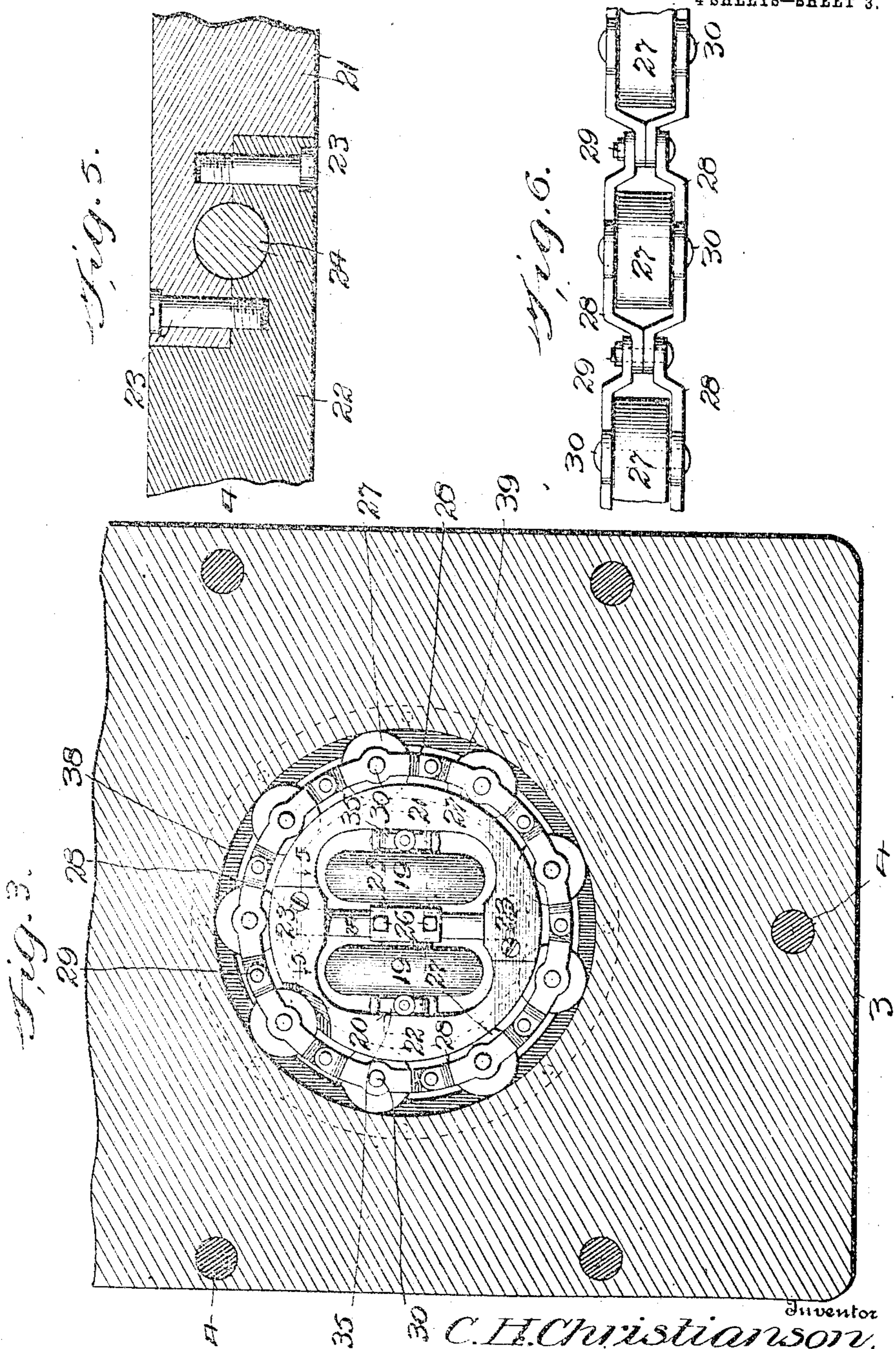
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4 SHEETS—SHEET 3.



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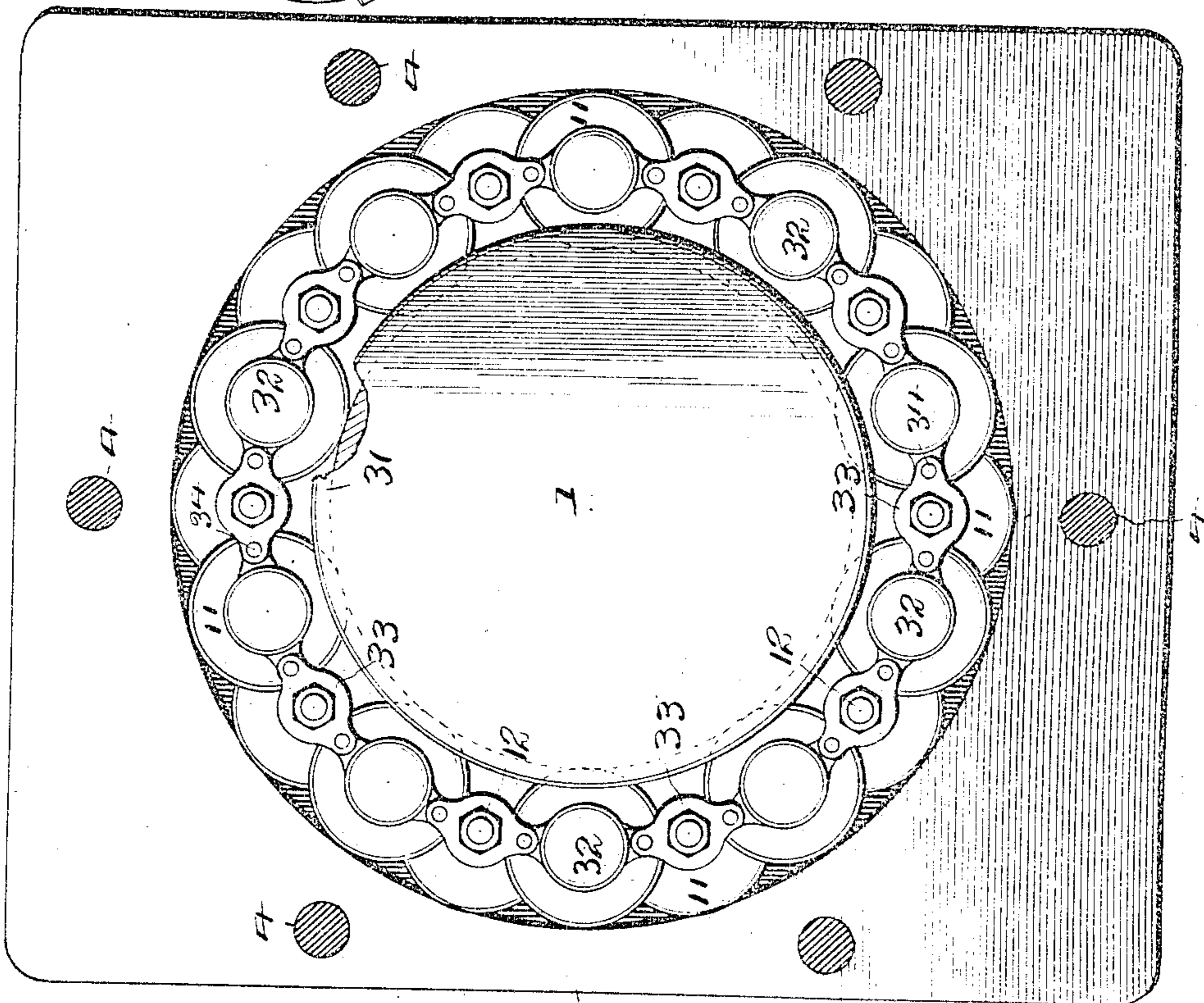
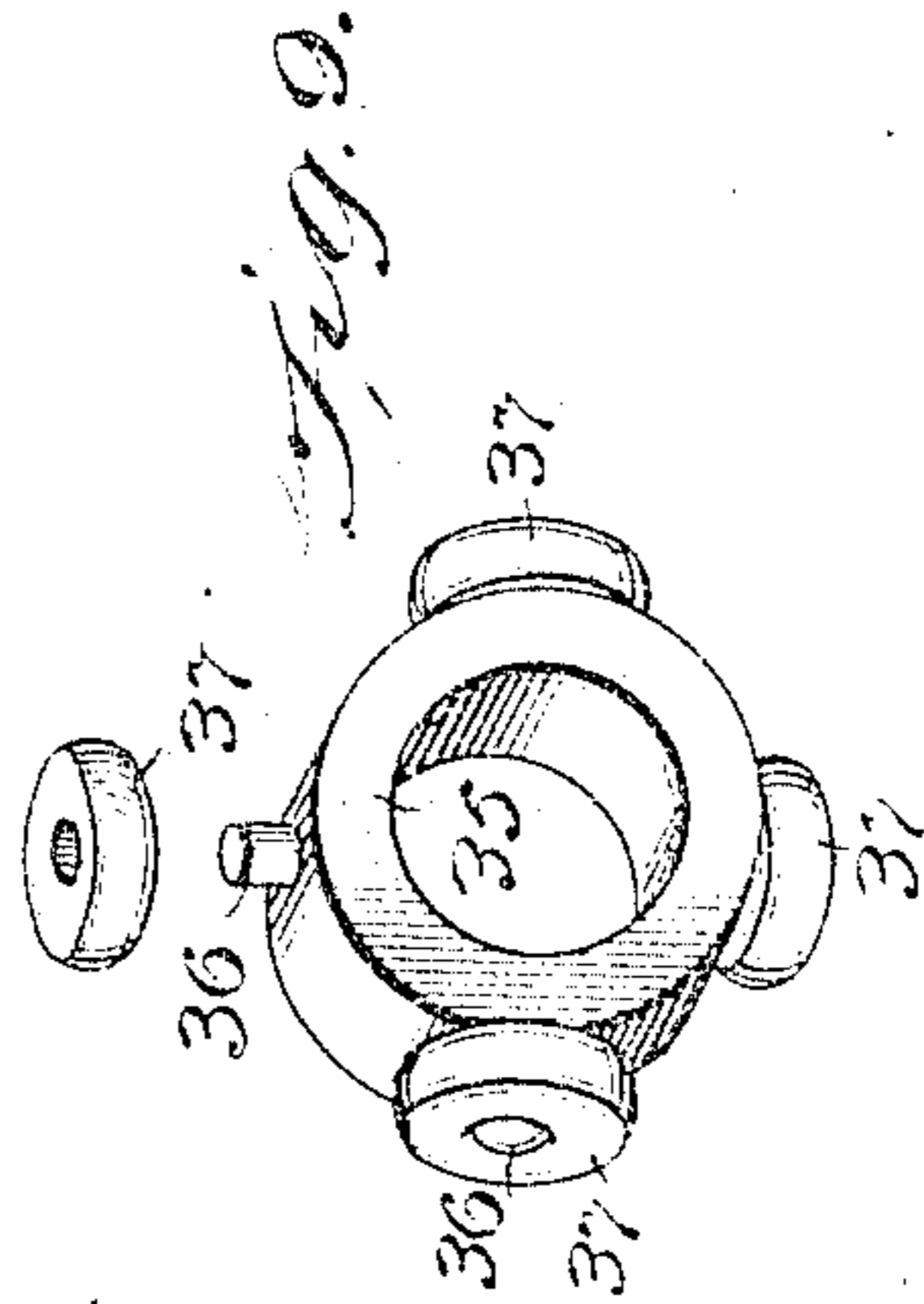
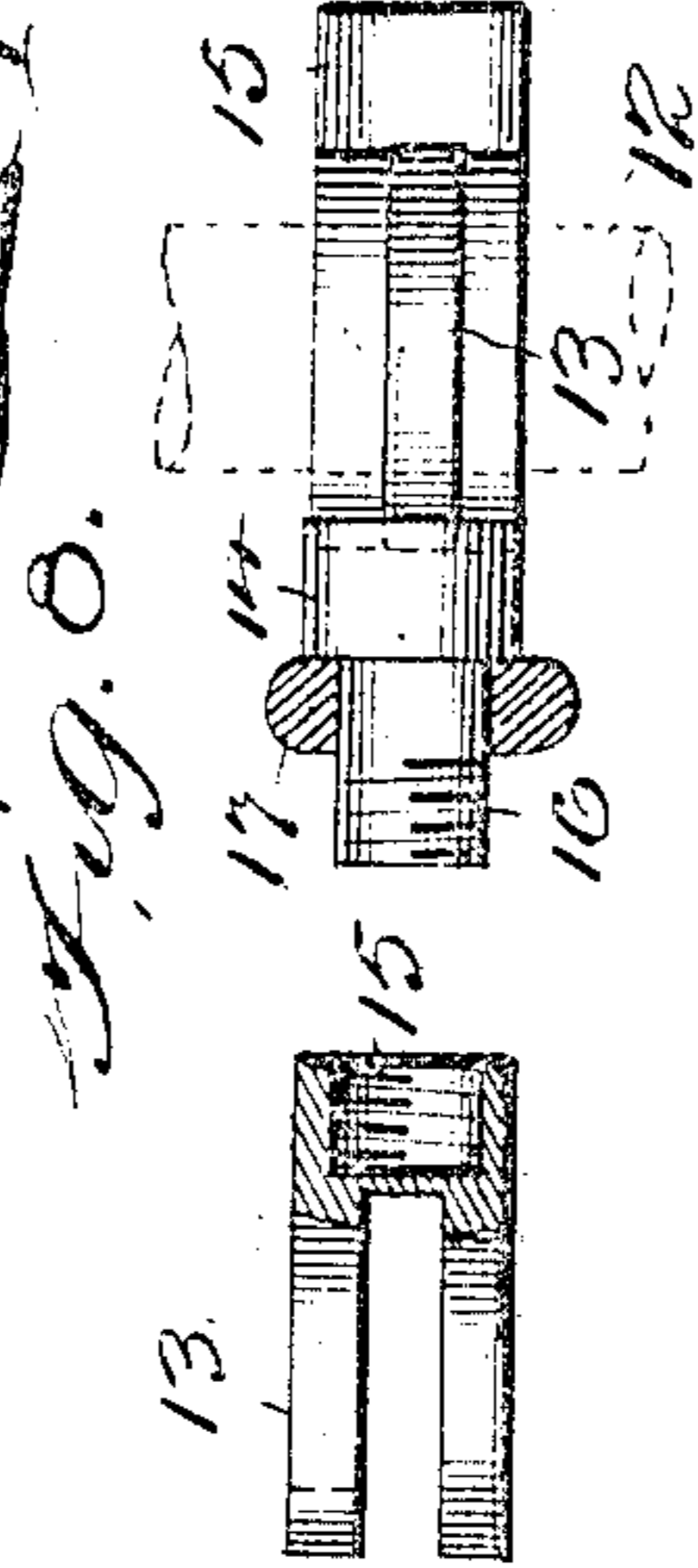
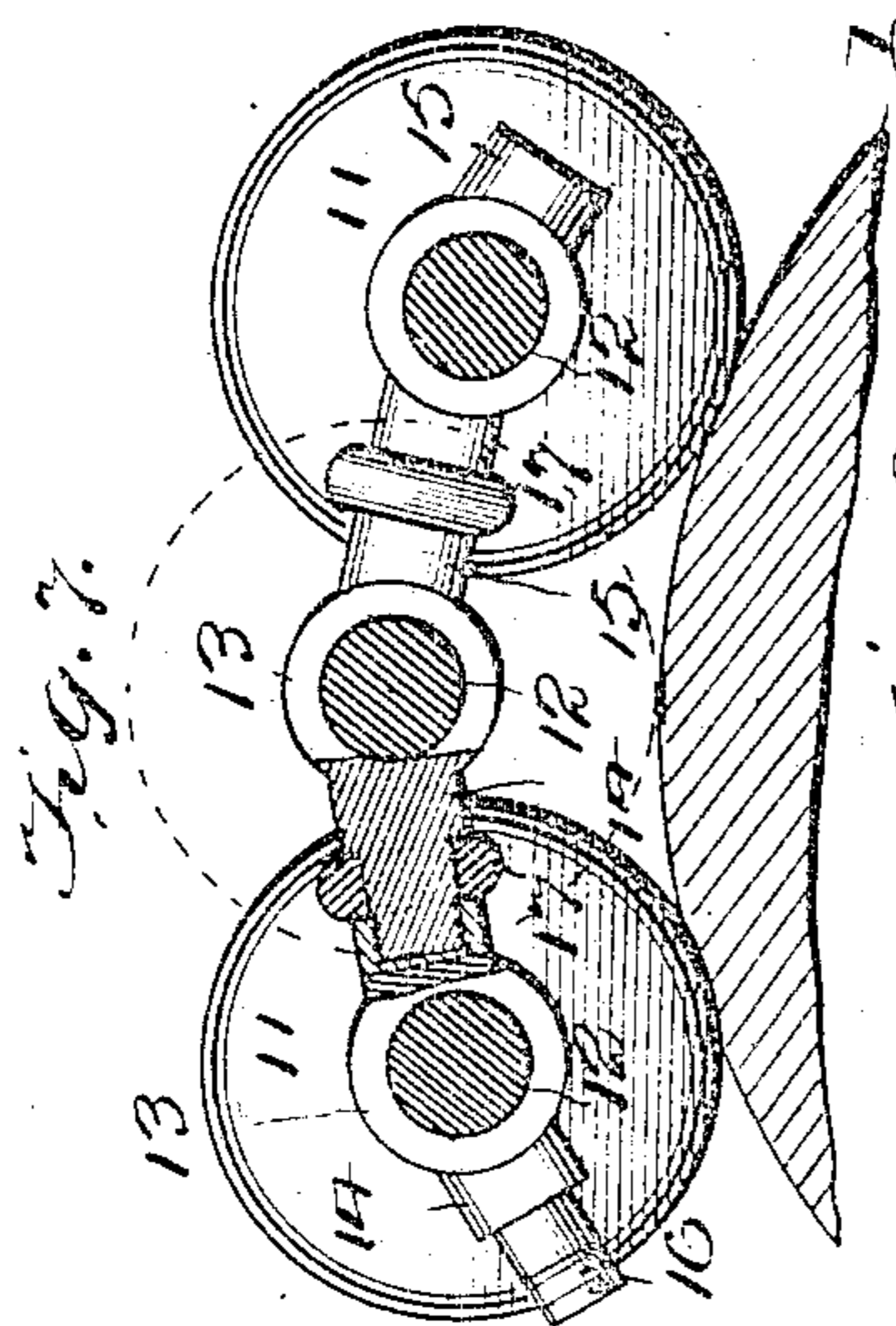
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4 SHEETS—SHEET 4.



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Fig. 11.

2

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Attorney

UNITED STATES PATENT OFFICE.

CHRISTIAN H. CHRISTIANSON, OF CHICAGO, ILLINOIS.

ANTIFRICTION-BEARING.

SPECIFICATION forming part of Letters Patent No. 788,020, dated April 25, 1905.

Application filed August 12, 1904. Serial No. 220,557.

To all whom it may concern:

Be it known that I, CHRISTIAN H. CHRISTIANSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Antifriction-Bearings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an antifriction-bearing; and it consists of certain novel features of combination and construction of parts, the preferred form or materialization whereof will be hereinafter clearly set forth, and pointed out in the claims.

The prime object of my invention, among others, is to provide a bearing of the character specified which while primarily designed as a bearing for car-axles will also be found reliably efficient and desirable for all manner of bearings, as upon freight and passenger cars, locomotives, automobiles, and, in fact, all variety of vehicles where it is desirable and necessary to reduce the friction incident to use of the journals or traveling wheels to a minimum.

Other objects and advantages will be hereinafter made clearly apparent, reference being had to the accompanying drawings, which are made a part of this application, and in which—

Figure 1 is a side elevation of my invention as applied to use upon a car-axle, the casing surrounding the end of the journal or axle being shown in section. Fig. 2 is a longitudinal central section, as indicated by line 2 2 of Fig. 1. Fig. 3 is a sectional view of my journal box or bearing, taken on line 3 3 of Fig. 1. Fig. 4 is a sectional view of Fig. 1, taken on line 4 4, the direction of the arrows indicating the viewpoint. Fig. 5 is a sectional view of part of my invention, taken on line 5 5 of Fig. 3. Fig. 6 is a detail view showing one of the means which may be adopted in connecting the plurality of antifriction wheels or rollers employed near the outer end of the journal-box. Fig. 7 is a detail view, partly in section, indicating means

of connecting the antifriction wheels or rollers employed in cooperation with the journal and provided in multiple to cooperate with that part of the journal within the journal box or housing. Fig. 8 is a detail view of part of the construction illustrated in Fig. 7 and other views. Fig. 9 is a perspective view showing an intermediary or antifriction device employed to separate the antifriction devices cooperating directly with the end of the journal and the walls of the journal-box. Fig. 10 is a detail sectional view, on an enlarged scale, of a portion of the antifriction device assembled.

For convenience of reference to the various details of my invention and cooperating accessories numerals will be employed, the same numeral applying to a similar part throughout the several views.

Referring to the numerals on the drawings, 1 indicates the end of the journal, while 2 indicates the journal-box proper, both of which may be constructed, substantially, in the usual manner, the said journal-box being designed as a housing for the bearing portion or outer end of the journal, as is common, the said box being connected with the supporting-trucks or carrying-frame in the usual well-known manner, and I therefore deem it unnecessary to specifically refer thereto.

The journal-box 2 is provided with the lid or closure section 3, which is held in union with the journal-box proper in any preferred way, as by the screw-bolts 4 or equivalent means. The middle portion of the lid or closure section 3 is provided with a swell or extension, as indicated by the numeral 5, and to this swell or extension I secure the lubricant box or receptacle 6, as by the screw-bolts 7, the said lubricant-box having, as is common, the normally closed lid 8, while a communicating duct or bore 9 is also formed in the swell extension 5, said duct or bore leading into the interior of the journal-box to insure that a proper supply of lubricant will pass by capillary attraction through the roll of waste or the like 10 and thence drop downward into the duct 9, as will be understood by reference to Fig. 1.

Mounted within the journal-box proper, 2,

and designed to cooperate with the end of the journal are the antifriction wheels or rollers or equivalent devices 11, arranged in overlapping series or groups, whereby the plurality of rollers will be disposed in staggered relationship, as will be observed by reference to Fig. 1. The said antifriction-rollers are loosely mounted upon the carrying-shafts 12.

In the present application I have illustrated in Fig. 1 each alternate shaft as being provided with three separated antifriction wheels or rollers, the remaining shafts having only two antifriction-wheels, and it will be understood that this arrangement may be varied and any desired number of antifriction-wheels disposed upon each alternate shaft, whereby said wheels will be located so that the wheels carried by one shaft will partly overlap the wheels of the next adjacent shaft, thereby insuring that the greatest possible amount of bearing-surface will be afforded for the end of the journal 1, it being understood that the diameters of the antifriction rollers or wheels 11 are the same and are of such extent as to reach into engagement with the periphery of the journal 1 and a contiguous part of the casing or journal-box 2.

It is obvious that the antifriction devices or wheels 11 are designed to support the load, and it therefore follows that said devices, together with the casing or journal-box 2, shall be formed of suitable material affording the requisite strength. Obviously the plurality of shafts 12 do not suffer any severe strain, their office being to hold the antifriction-wheels in proper alinement, and in order that each shaft and antifriction-wheels cooperating therewith may travel in proper unison with each other I provide suitable means for connecting said shafts, whereby a continuous or endless chain or group of wheels will be formed, which shall extend entirely around the end of the journal, and consequently fill the entire annular space between the periphery of the journal and the surface of the journal-box. In order, therefore, to properly connect the journals with each other, any preferred means may be adopted for the purpose, though in this connection I call attention to the construction in Fig. 7, wherein it will be observed that a suitable collar 13 is provided, said collar being designed to fit loosely around the shaft 12 and may be formed in any desired way, though preferably with integral extensions 14 and 15 upon diametrically opposite sides. It will be observed that the extension 14 is formed with a reduced threaded portion or stem 16, designed to be received by the socket extension 15, said socket being necessarily internally threaded.

The shafts or stems 16 are of proper length to have an unthreaded portion, and upon said unthreaded parts I rotatably dispose the antifriction rotating collars or wheels 17, the

location of said antifriction devices being such that they will engage a contiguous part of the main antifriction-wheels 11, whereby said wheels will be reliably separated with the least possible degree of friction incident to attaining such result.

It will be observed by reference to Fig. 1 that the journal 1 passes loosely through an opening 18 in the inner end of the journal-box, whereby said journal will not engage the walls of the box incident to the use thereof. To provide against an end thrust of the journal, whereby it will contact with the closure or lid section 3, I utilize the space on the inner side of the swell or extension 5 in order to mount suitable antifriction-rollers, as indicated by the numeral 19, said rollers being rotatably supported upon the shaft 20. The antifriction rollers or wheels 19 are properly spaced that they will engage the end of the journal upon opposite sides of the axial plane thereof, and by reference to Figs. 2 and 3 it will be observed that the shaft 20 is seated in suitable bores provided in the semicollar members 21 and 22, the ends of said collars being overlapped on each other, as shown in Fig. 5, whereby the outer edges thereof will be left flush with each other, said overlapped portions being locked in permanent union with each other, as by the clamping screws or bolts 23. The shaft 20 is reinforced and sustained in its central portion by an auxiliary shaft 24, which is provided in its central part with an enlarged, preferably squared, section 25, integrally formed with said shaft or otherwise connected thereto, as by providing parts having suitable recesses and seating the shaft 24 therein and locking the parts together, as by the set-screws 26. The outer ends of the shaft 24 are received between the overlapped ends of the semicircular collar members 21 and 22, as illustrated in Fig. 5. The periphery of the collar members 21 and 22 is shaped to provide a continuous groove therearound, and within said groove is designed to travel a plurality of antifriction-wheels 27, said wheels being connected with each other in a continuous chain, as by the side bars 28, properly shaped at their meeting ends and connected together, as by the bolt or rod 29 or other equivalent means. Each of the side bars 28, it will be understood, is provided with a suitable aperture designed to register with an aperture or bore in the antifriction-wheel 27, whereby the rod or axle 30 may be mounted in the proper place, whereby the side bars will be connected with the wheel between them and permit said wheel to freely rotate incident to use.

By reference to Fig. 2 it will be observed that the extreme outer end of the journal 1 is provided with a radial flange or edge 31, which will tend to confine the antifriction-wheels in their proper places within the hous-

ing. It will furthermore be observed that the swaying motion of the car will cause the antifriction-wheels 19 to bear against the end of the axle and a contiguous part of the inner wall of the swell or extension 5, thus insuring that a minimum amount of friction will result. Each end of each alternate shaft 12 is seated in a semispherical member 32, while each remaining shaft is journaled into a link-section 33, said semispherical members and links being pivotally united, as by the rivets or bolts 34, whereby a continuous chain will be formed supplementing the intermediate connections cooperating with said shafts. Between the semispherical members 32 and the contiguous antifriction-wheels 11 I locate the collar-like members 35, having the outwardly-extending lugs or pintles 36, upon which I rotatably secure antifriction-wheels 37, corresponding in function with the antifriction devices 17, the same being designed to bear against a part of the contiguous antifriction-wheel 11, as will be clearly seen in Fig. 10 of the drawings. The antifriction-collars 35 may also be located between the walls of the semicollar members 21 and 22 and the antifriction-wheels 19. Obviously a very small amount of lubrication will be required to maintain the end of the journal or axle and the antifriction devices cooperating therewith and the journal-box in the most desirable condition.

It will be seen that I have provided a most reliable and efficient means for reducing the friction to a minimum, and which may be readily applied to use upon the journals of railway-cars and upon locomotives with the slightest possible degree of change in the structural arrangement of the parts as now formed, and while I have described the preferred combination and construction of parts deemed necessary in materializing my invention I wish to comprehend in this application all substantial equivalents and substitutes as may be considered as fairly falling within the scope and purview of my invention.

Inasmuch as the antifriction-rollers travel in the grooved periphery of the semicollar members 21 and 22 they are also disposed so that their outer edges will be disposed in the annular groove 38, formed in a contiguous part of the closure member 3, as clearly shown in Fig. 2, a suitable plate 39 being provided to complete the inner edge of said groove and hold said antifriction-wheels in place, thereby permitting the entire collar formed of the members 21 and 22 to freely turn incident to the rotation of the journal 1. All parts of the journal or axle are therefore in engagement only with movable yielding devices, as the antifriction-wheels 11 and 19, thereby necessitating a much smaller amount

of power or force for the propulsion of the car or other vehicle to which my invention may be applied, and believing that the advantages, construction, and manner of using my invention have thus been made clearly apparent further description is deemed unnecessary.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an antifriction-bearing for axles, the combination with the axle, of a housing or journal-box therefor, a plurality of antifriction-rollers occupying the annular space between the journal and its housing, a plurality of carrying-shafts for said antifriction-rollers, a plurality of collars located upon said shafts, said collars having integral extensions upon diametrically opposite sides thereof, one of said extensions terminating in a screw-threaded portion while the other extension is provided with an interiorly-threaded socket, the extension having the socket being designed to receive the threaded end of the next succeeding extension, and rotating collars or wheels carried by the threaded ends of said extensions and disposed in cooperation with the faces of the antifriction-rollers whereby said rollers will be disposed and held a predetermined distance apart upon the carrying-shafts, as set forth.

2. In an antifriction-bearing for axles, a plurality of carrying-shafts, a plurality of antifriction-rollers mounted upon said shafts means to carry said shafts and rollers thereon in a group comprising collars having extensions on diametrically opposite sides thereof, one of said extensions being reduced in size at its outer end to form a shoulder, the extreme outer end of said reduced portion being threaded, the opposite extension being provided with an interiorly-threaded socket to receive the threaded end of the next succeeding extension, and collars rotatably mounted upon the reduced portion of said extensions and held in position between the shoulder upon one extension and the end of the socketed extension, all combined substantially as set forth.

3. In antifriction-bearings, the combination with a plurality of carrying-shafts and antifriction-rollers mounted thereon, of means to unite said shafts and rollers into a continuous group, and collars or wheels carried by said means and disposed at right angles to the plane of said antifriction-rollers adapted to properly space said rollers, as set forth.

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

CHRISTIAN H. CHRISTIANSON.

Witnesses:

JENS M. JENSEN,
ANTON JENSEN.