

No. 780,375.

PATENTED JAN. 17, 1905.

G. NELSON.
GEARING.

APPLICATION FILED FEB. 17, 1904.

3 SHEETS—SHEET 1.

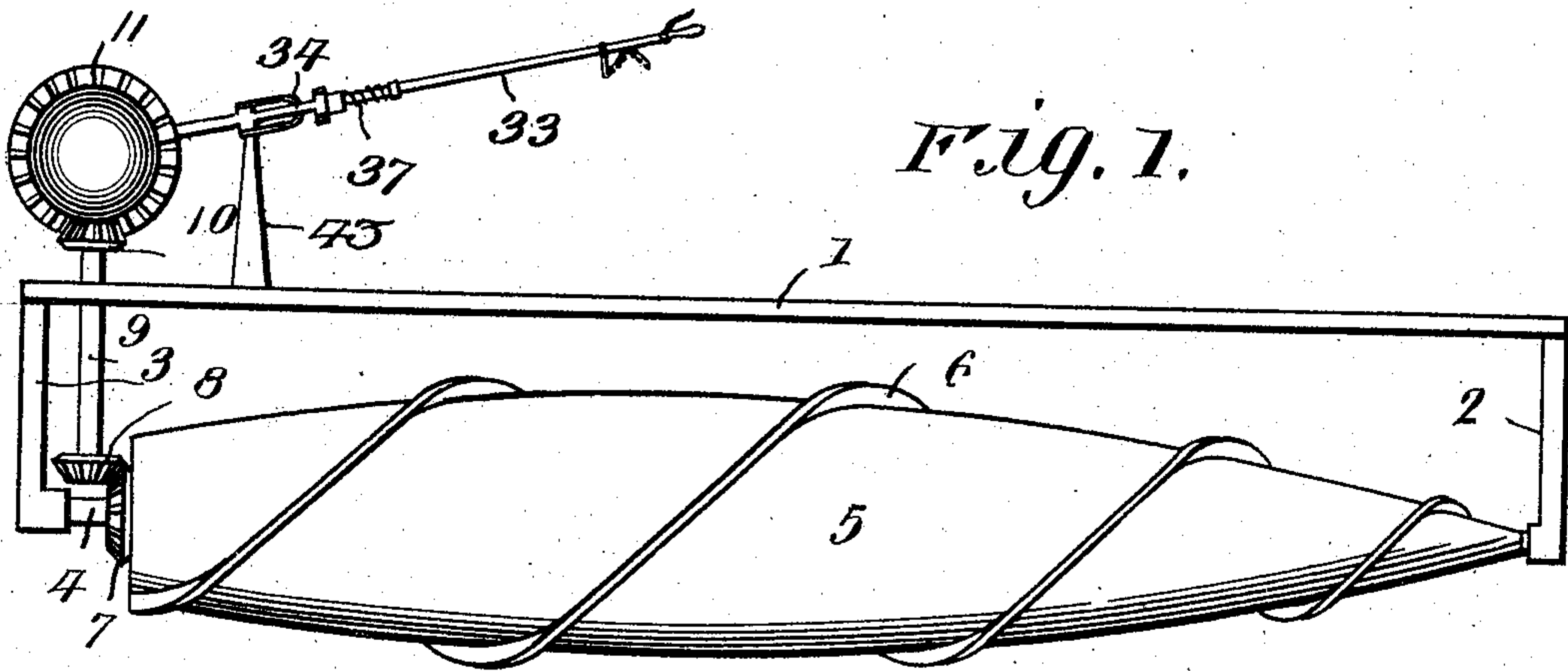


Fig. 1.

Fig. 2.

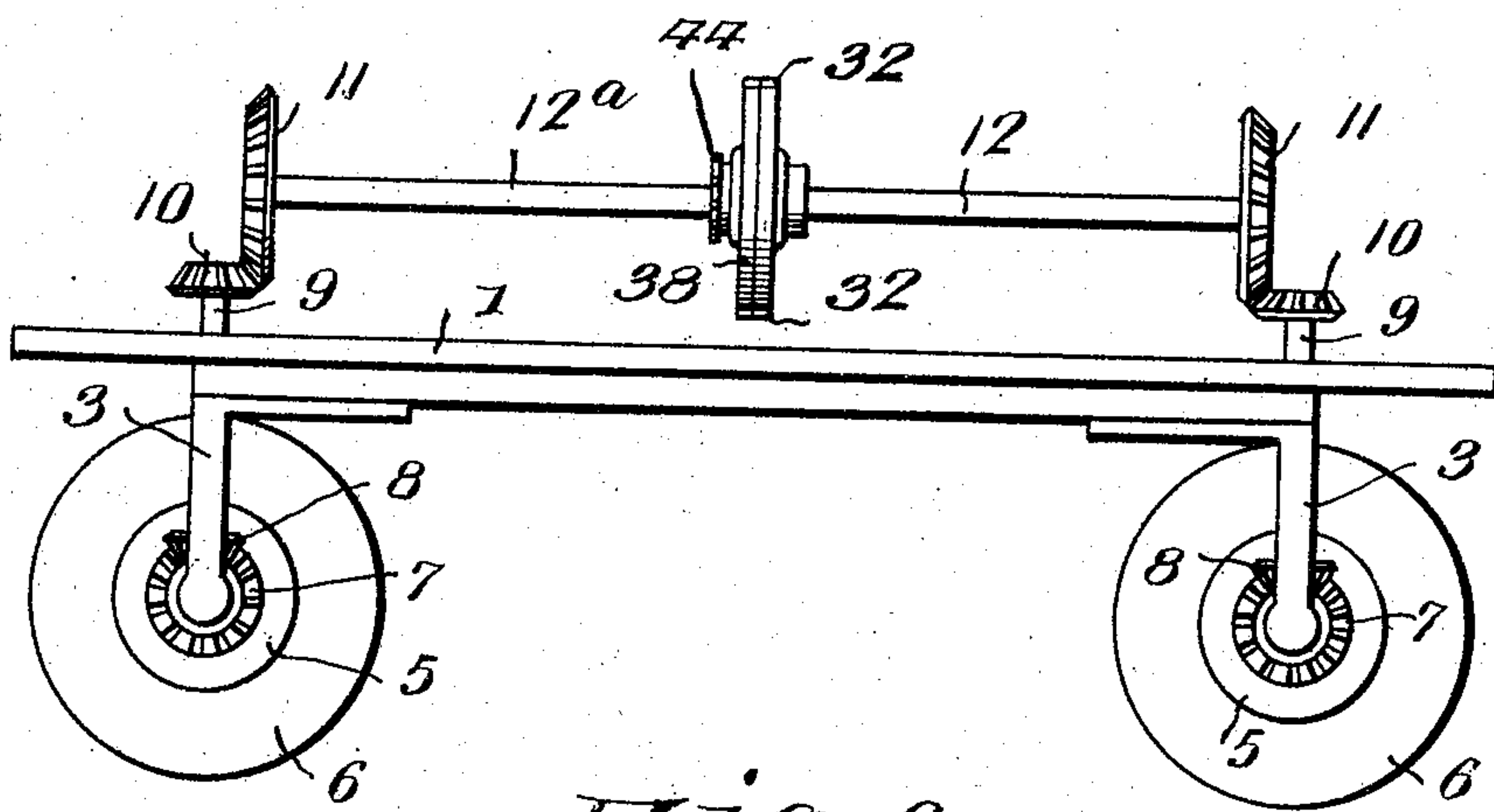
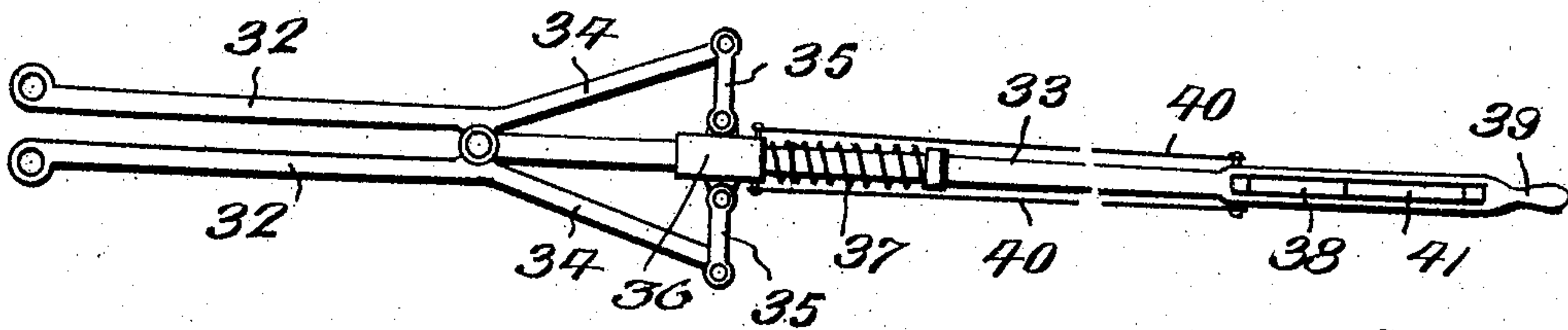


Fig. 6.



Inventor

Gustaf Nelson.

Witnesses

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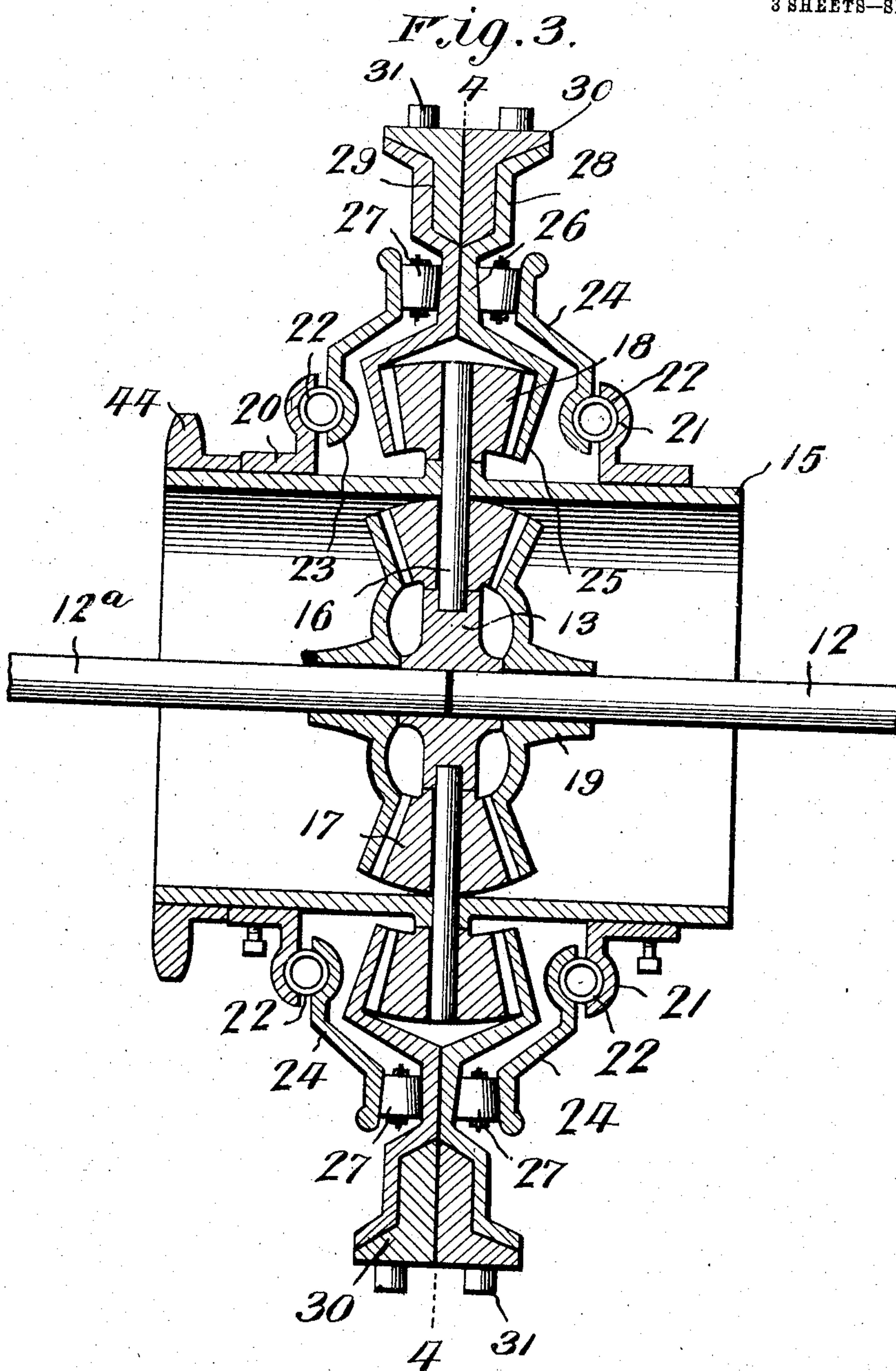
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3 SHEETS—SHEET 2.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 4.

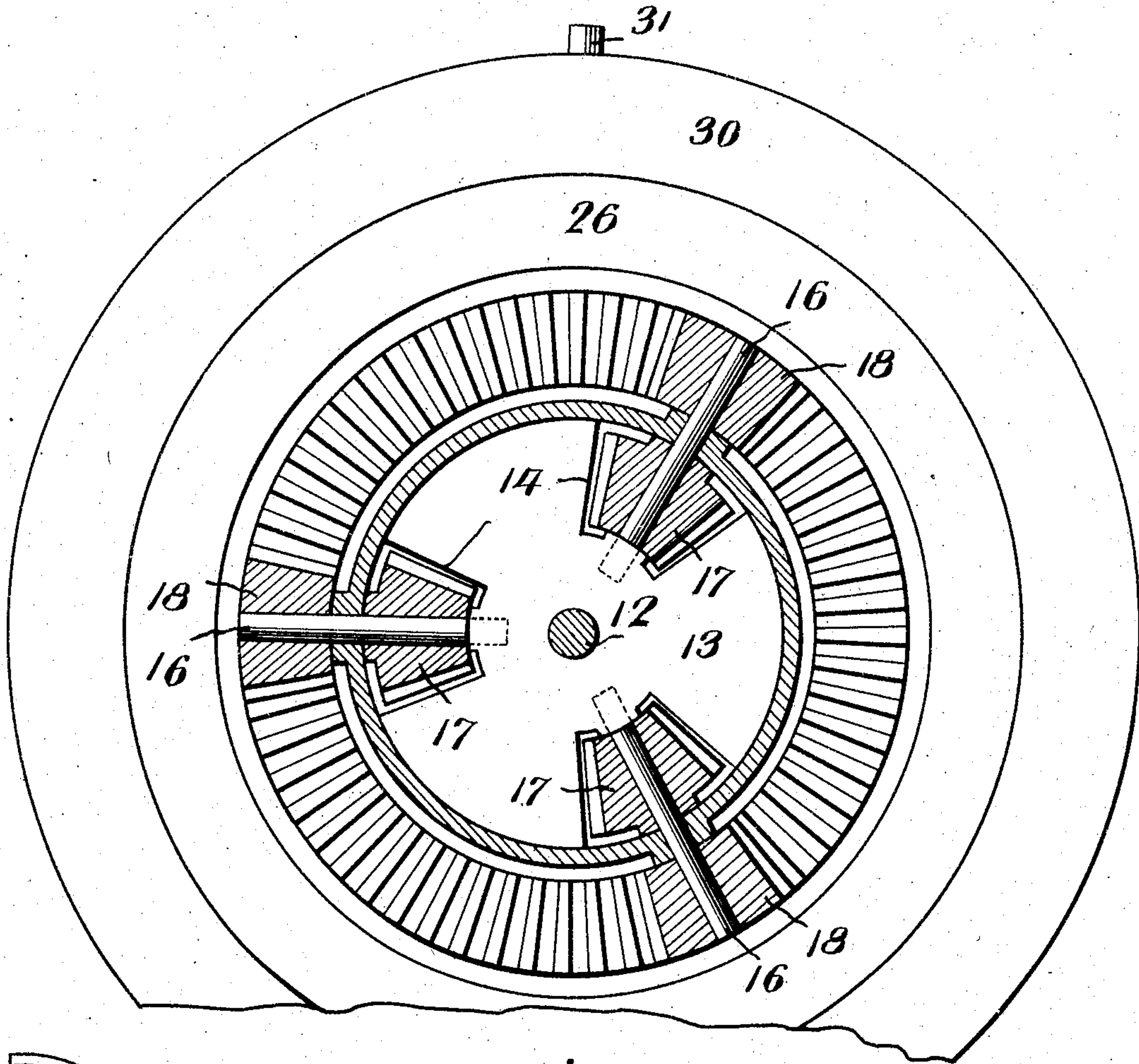
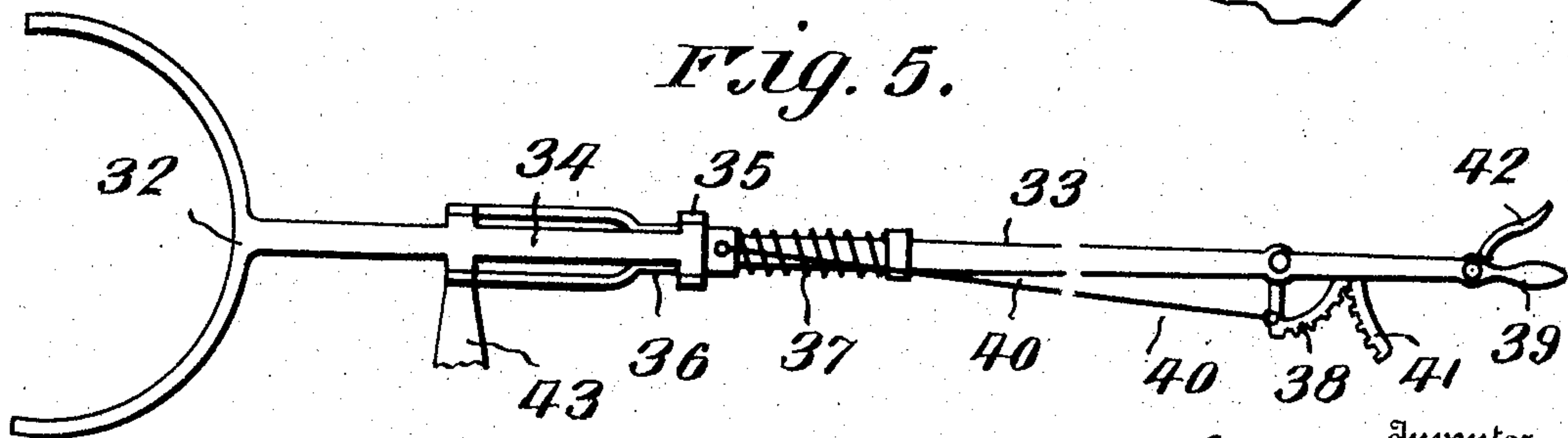


Fig. 5.



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UNITED STATES PATENT OFFICE.

GUSTAF NELSON, OF ST. LOUIS PARK, MINNESOTA.

GEARING.

SPECIFICATION forming part of Letters Patent No. 780,375, dated January 17, 1905.

Application filed February 17, 1904. Serial No. 193,974.

To all whom it may concern:

Be it known that I, GUSTAF NELSON, a citizen of the United States, residing at St. Louis Park, in the county of Hennepin and State of Minnesota, have invented new and useful Improvements in Gearing, of which the following is a specification.

My invention relates to new and useful improvements in steering and propelling mechanism for boats; and its object is to provide compact and efficient means whereby a boat can be steered without the employment of a rudder, such steering operation being produced by means which are also employed for regulating the speed of the boat.

With the above and other objects in view the invention consists of a body having floats at the sides thereof, each float being inclosed by a worm and the two worms being arranged opposite to each other. These floats are rotated by mechanism interposed between them and a differential gear of novel construction and having means whereby the two shafts connected to the gear can be rotated at the same or different speeds and whereby the speed of the shaft can be regulated.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a side elevation of a boat having my improved steering and propelling mechanism thereon. Fig. 2 is an end elevation thereof, showing the means for transmitting motion from the power-shaft to the revoluble floats. Fig. 3 is an enlarged transverse section through the differential gear. Fig. 4 is a section on line 4 4, Fig. 3; and Figs. 5 and 6 are plan and side elevations, respectively, of the operating-lever.

Referring to the figures by numerals of reference, 1 is a platform having hangers 2 and 3 extending from the front and rear thereof, and within each pair of hangers is journaled a shaft 4, to which is secured a revoluble float 5, preferably tapered toward the front end thereof and formed of sheet metal. Each float is inclosed by a worm 6, and the

worms on the two floats are oppositely arranged. A beveled gear 7 is secured to the rear end of each float and meshes with another gear, 8, arranged at the lower end of an upright shaft 9, suitably connected to the platform and having a beveled gear 10 at its upper end. These gears 10 mesh with gears 11, connected to the outer ends of horizontal shafts 12 and 12^a. These shafts are arranged in alinement with each other, and their inner ends are revolubly mounted within a collar 13, having recesses 14 in the periphery thereof. This collar is also secured to a cylindrical hub 15, which incloses the two shafts 12 and 12^a, and revolubly mounted within the hub are pins 16, which project into the recesses 14 and are journaled in the inner ends of these recesses. Revolubly mounted upon the pins and keyed or otherwise secured to them are gears 17, which are located within the recesses. Gears 18 are also secured to the pins at points outside of the hub. Gears 19 are secured to the inner portions of the shafts, and said gears mesh with opposite sides of the gears 17. Flanges 20 are arranged about hub 15 and have grooves 21 in their inner faces, in which are arranged rings 22, formed of coiled springs. These rings fit within grooves 23, formed within the outer faces of clamping-rings 24, which inclose the hub and are arranged at opposite sides of the gears 18. Toothed rings 25 are located at opposite sides of the gears 18 and mesh therewith, and each of these rings has a concentric flange 26, and the two flanges are adapted to normally contact. Rollers 27 are interposed between these flanges and the rings 24. Angular annular extensions 28 are formed integral with the flanges 26 and produce a groove 29 therebetween, in which are arranged oppositely-disposed similar friction-rings 30, having lugs projecting from opposite sides thereof. These lugs are adapted to engage the ends of similar yokes 32, which are pivoted to one end of a lever 33 and have inwardly-extending arms pivoted to links 35. These links are pivotally connected to a sleeve 36, slidably mounted upon the lever and having a spring 37 bearing thereagainst, so as to hold the sleeve 36 normally pressed toward the pivots of the yokes. A toothed segment 38 is piv-

oted to the lever adjacent its handle 39 and is connected, by means of rods 40, with the sleeve 36. Another toothed segment 41 meshes with segment 38 and has an arm 42 extending therefrom and pivoted to the lever adjacent the handle 39. It will thus be seen that by drawing the arm 42 toward handle 39 the segment 41 will cause segment 38 to rotate upon its pivot, and thereby draw the sleeve 36 longitudinally on lever 33 and pull the arms 34 of the yoke toward each other, so as to spread apart the ends of the yokes. Lever 33 is pivotally mounted upon a standard 43, extending upward from the platform 1, and is so mounted as to permit it to be swung laterally in either direction.

A sprocket 44 is secured to the hub 15 and is adapted to receive rotary motion from any suitable motor, which may be arranged on platform 1, but which is not shown. As the hub 15 is secured to the sprocket, it is obvious that the same will rotate therewith, as will also the collar 13. As the resistance offered by both of the rings 25 to the gears 18 is the same, it will be understood that these rings will be rotated in unison with the hub 15 and the gears 17, and as the two gears 19 mesh with gears 17 both of the shafts 12 and 12^a will be rotated together. When it is desired to retard the rotation of the shafts 12 and 12^a, this can be readily done by drawing the arm 42 toward the handle 39, so as to spread the two yokes 32 apart. As these yokes engage the lugs 31, friction-rings 30 will be spread laterally into contact with the annular extensions 28 and will bear against them equally, and thereby retard their rotation, and consequently the rotation of the collar 13 and the parts connected thereto, as well as the shafts 12 and 12^a. If it is desired to rotate the shafts 12 and 12^a in opposite directions, the lever 33 is swung laterally in the proper direction, so as to depress the friction-rings 30 into contact with one of the annular extensions 28. This extension will nearly or entirely stop revolving, according to the pressure exerted thereon, and therefore the gears 18 will be caused to rotate upon the ring 25, connected to said contacted extension, and pin 16 will revolve therewith and cause the two gears 19 to rotate in opposite directions. The spring-rings 22 cause the rings 24 to bear at all times upon the rollers 27 to hold them in contact with flanges 26, and therefore a certain amount of lateral movement of said flanges and their angular extensions is permitted. As the shafts 12 and 12^a are connected by the gears 10 and 11 and shaft 9 and gears 8 and 7 with the floats 5, it will be understood that when the two shafts 12 and 12^a are rotating at the same speed and in the same direction the two floats 5 will also be rotated, and the worms 6 thereon will contact with the water and propel the boat forward. When the shafts 12 and 12^a are rotated in opposite directions in the manner described, the same

result will be produced upon the floats 5, and therefore the course of the boat can be changed at will.

It will be seen that by providing mechanism such as herein described, it is unnecessary to employ a multiplicity of levers, and a single lever is all that is necessary to both regulate the speed of the boat and to steer the same.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

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

1. The combination with oppositely-extending shafts having gears at the adjoining ends thereof; of gears interposed between said last-mentioned gears and meshing therewith, a second set of gears revoluble with the interposed gears, oppositely-disposed toothed rings engaging the second set of gears, means for automatically holding said rings in frictional contact, and mechanism for controlling the rotation of the rings.

2. The combination with alining shafts having gears thereon, and gears interposed between the gears of the shaft and meshing therewith; of a second set of gears revoluble with the interposed gears, oppositely-disposed toothed rings meshing with said second set of gears, spring-pressed rollers bearing upon the rings for holding them normally in contact, friction-rings interposed between the toothed rings, and means for shifting said friction-rings into contact with either or both of the toothed rings.

3. The combination with alining shafts having gears adjacent the ends thereof; of a hub inclosing the gears and shaft, pins revolubly mounted within the hub, gears at the ends thereof, the gears at one end of the pins meshing with the gears on the shafts, oppositely-disposed toothed rings meshing with the other gears on the pins, spring-pressed rings supported by the hub at opposite sides of the toothed rings, friction-rollers interposed between said rings, friction-rings interposed between the toothed rings, and means for forcing the rings into contact with one or both of the toothed rings.

4. The combination with oppositely-disposed alining shafts having oppositely-disposed gears at the adjoining ends thereof; of a collar loosely mounted upon the shafts and between the gears, a hub integral with the collar, pins revolubly mounted within the hub and collar, gears secured to the pins, the gears at one end thereof meshing with the gears on the shaft, oppositely-disposed toothed rings meshing with the other gears, flanges secured to the hub, rings interposed between the

flanges, springs interposed between the flanges and rings, friction-rollers between said rings and the toothed rings, friction-rings interposed between the toothed rings, and means for forcing said friction-rings into contact with either or both of the toothed rings.

5 5. The combination with alining shafts having gears thereon, and gears interposed between the gears on the shaft and meshing therewith; of a second set of gears revoluble with the interposed gears, oppositely-disposed toothed rings meshing with said second set of gears, spring-pressed rollers bearing upon the

rings for holding them normally in contact, friction-rings interposed between the toothed rings, a laterally-movable lever, oppositely-disposed yokes pivoted thereto and engaging the friction-rings, and means for moving the yokes simultaneously in opposite directions.

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

GUSTAF NELSON.

Witnesses:

CHAS. WESTBERG,
H. P. HOFSTRAND.