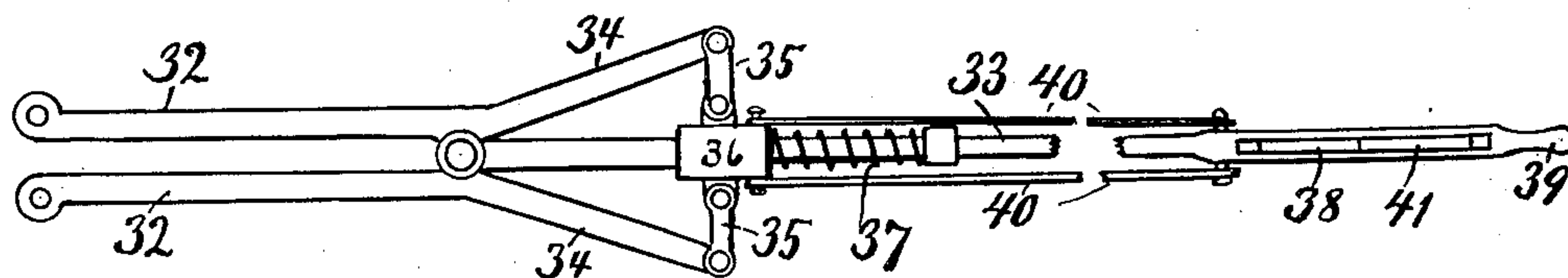
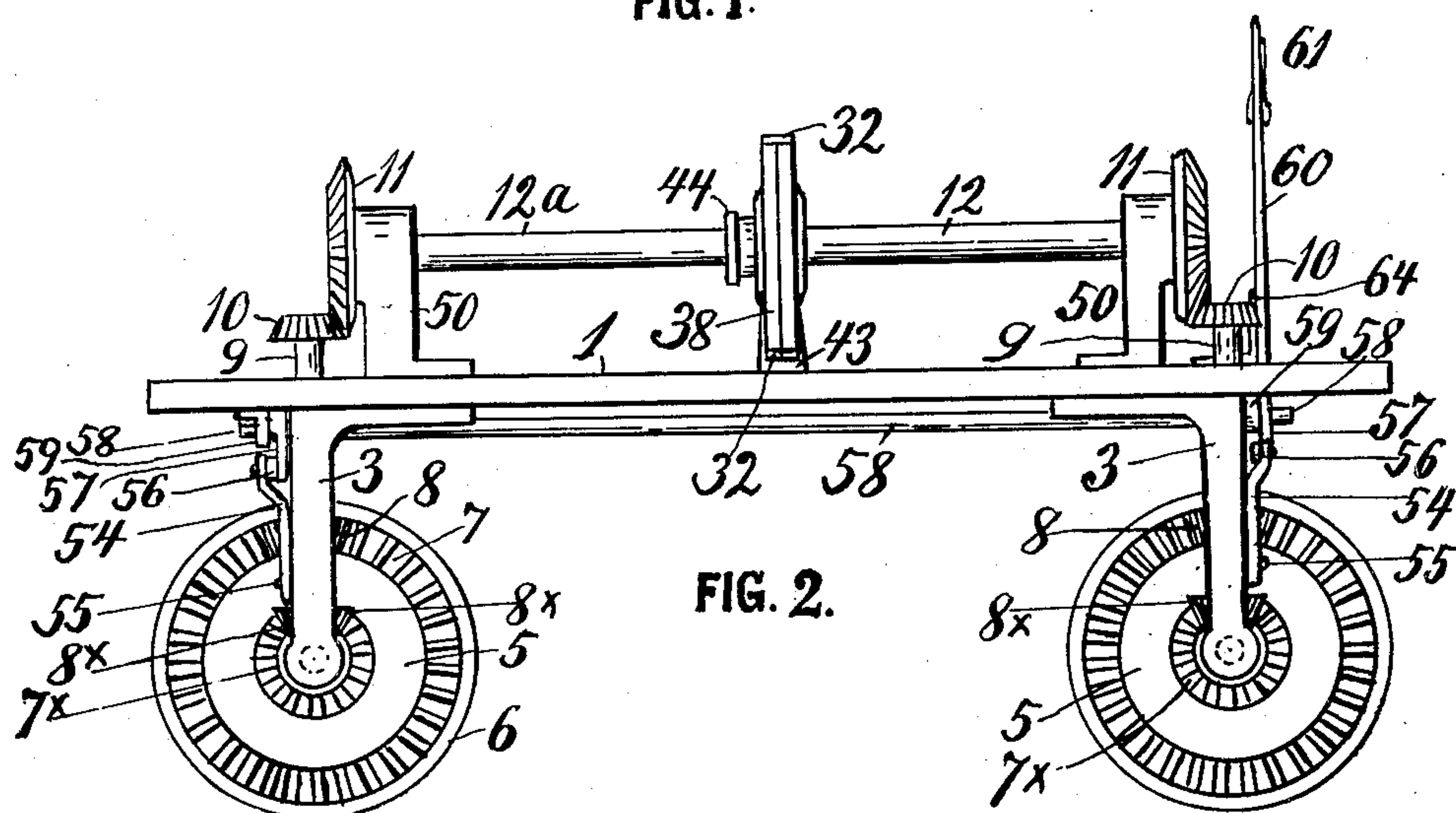
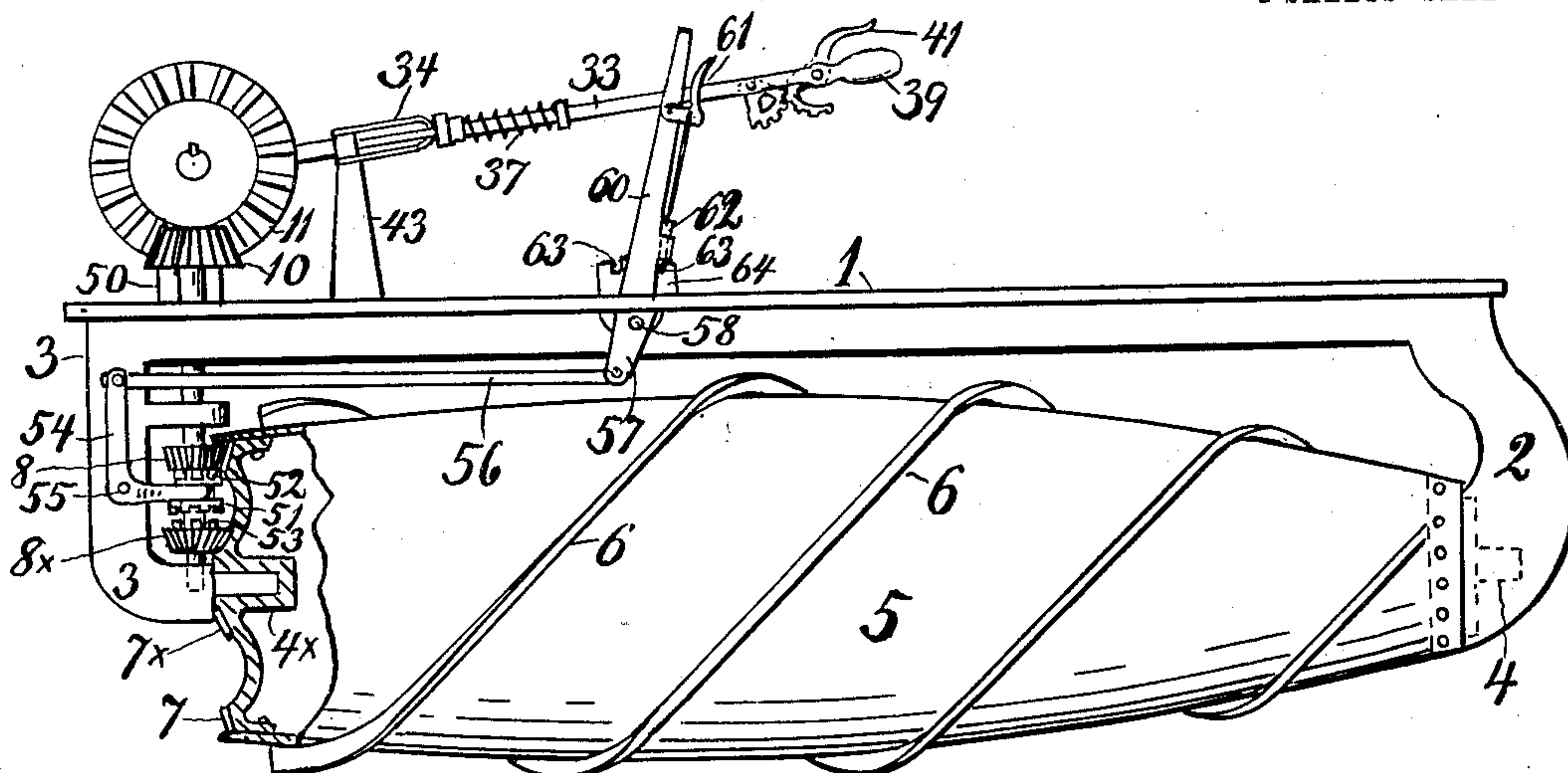


PATENTED NOV. 27, 1906.

BOAT AND PROPELLING GEAR FOR SAME.

APPLICATION FILED DEC. 8, 1905.

2 SHEETS—SHEET 1.



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No. 836,821.

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2 SHEETS—SHEET 2

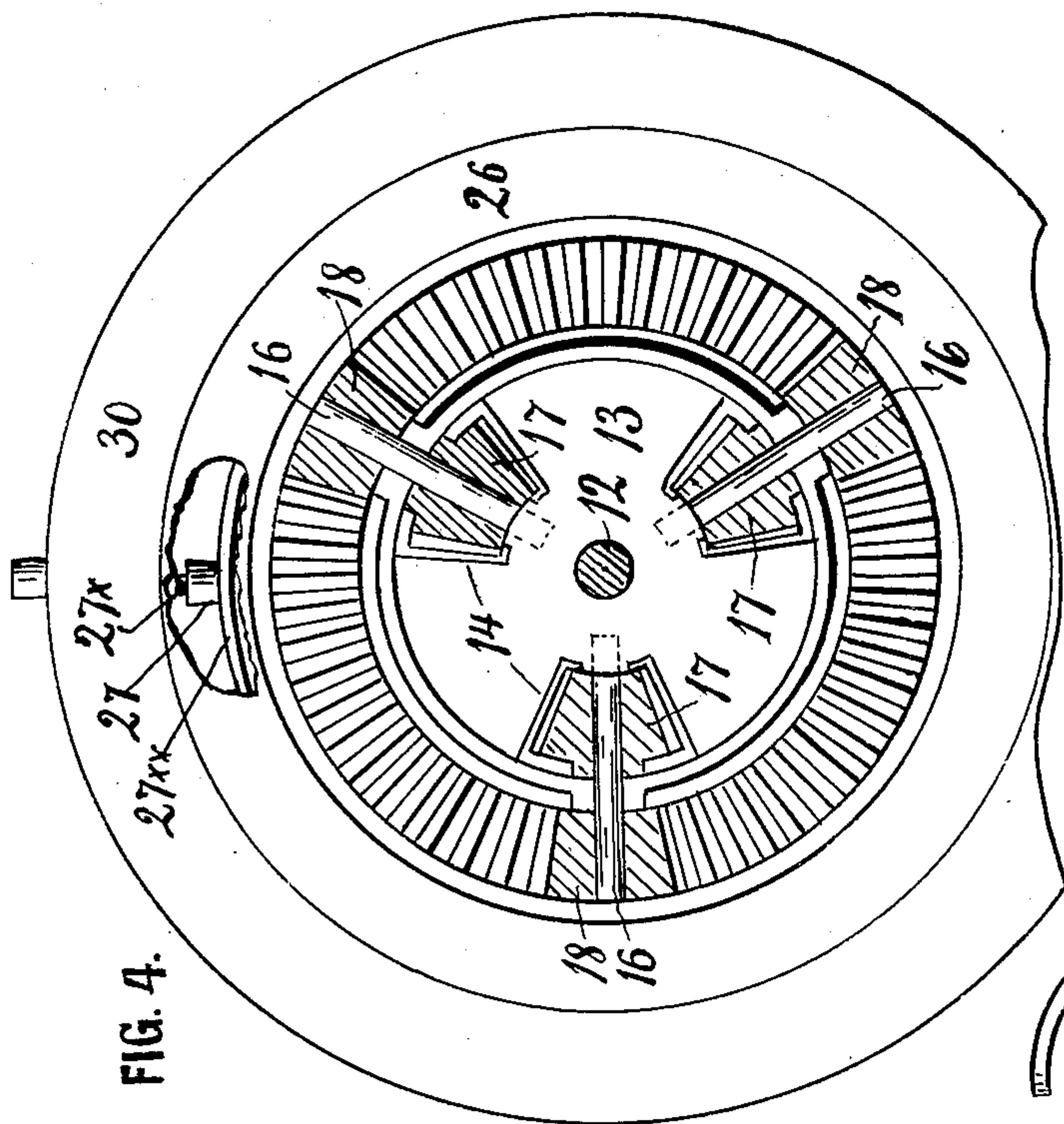


FIG. 4.

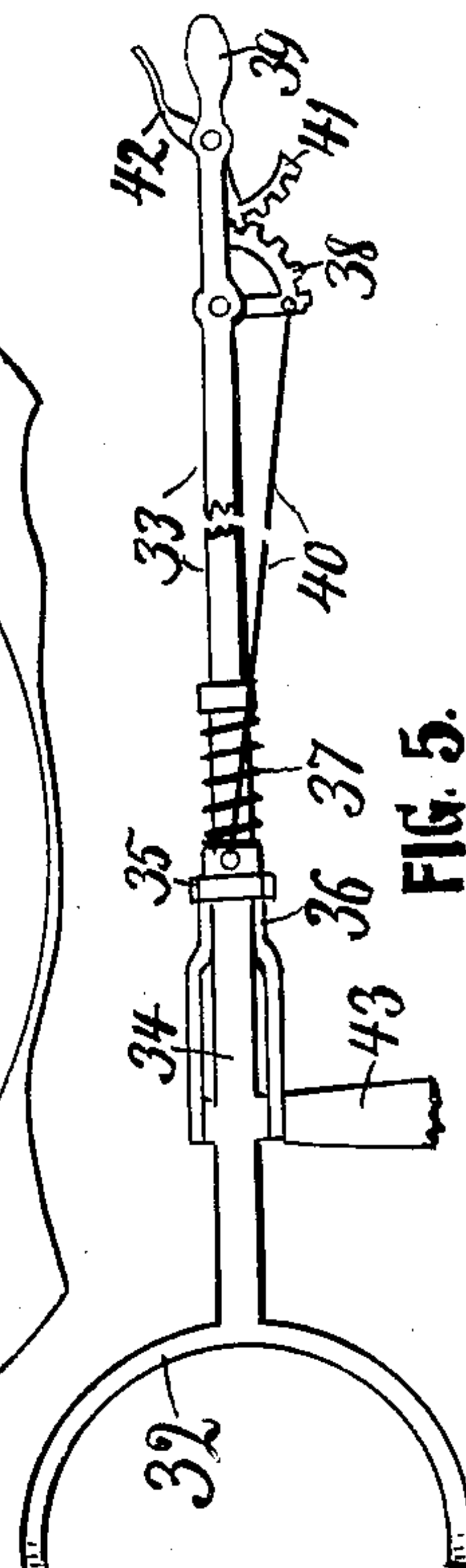


FIG. 5.

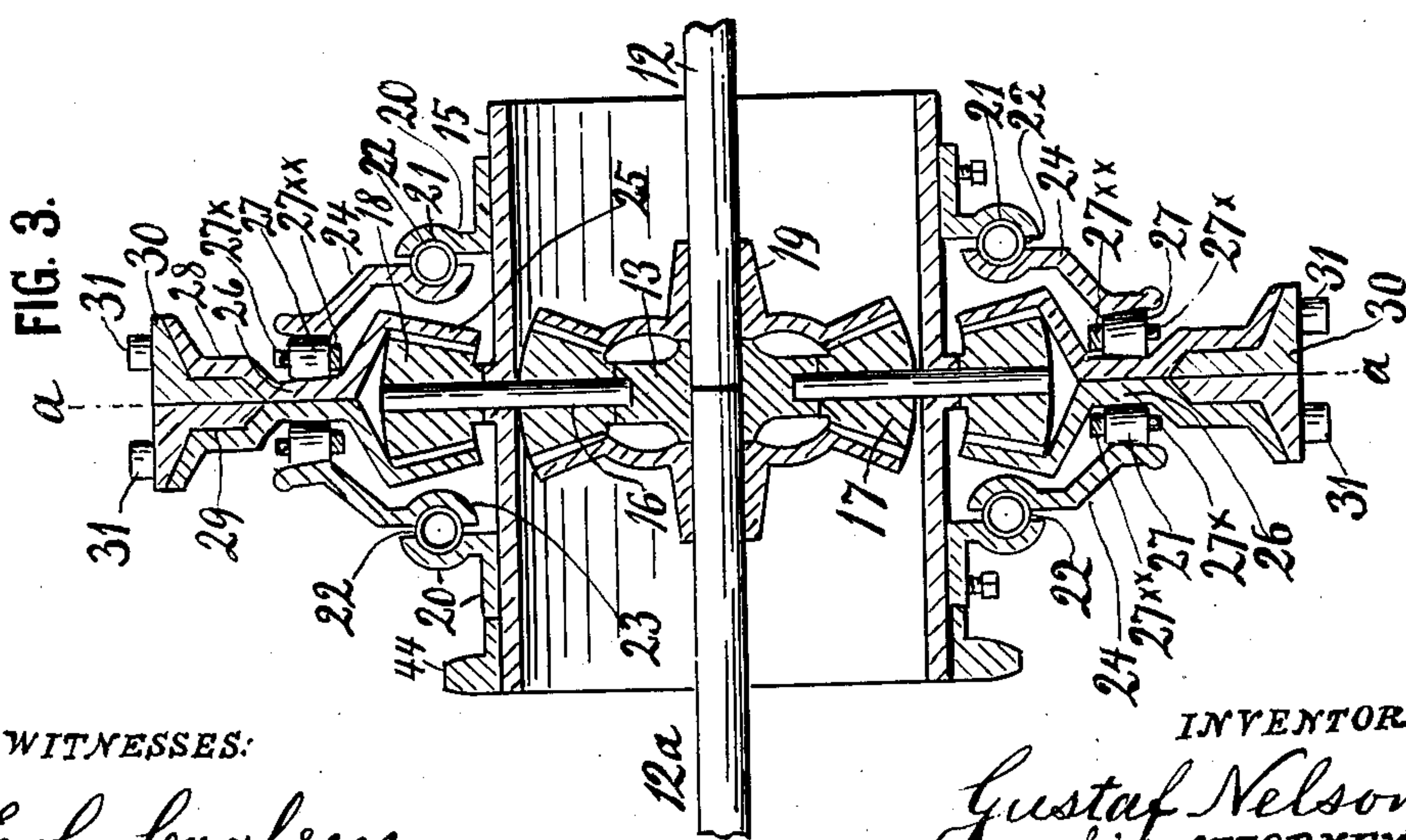


FIG. 3.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

GUSTAF NELSON, OF ST. LOUIS PARK, MINNESOTA.

## BOAT AND PROPELLING-GEAR FOR SAME.

No. 836,821.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed December 8, 1905. Serial No. 290,998.

*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 certain new and useful Improvements in Boats and Propelling-Gear for Same; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to new and useful improvements in boats adapted to travel on water and also on ice and snow on the land; and the objects are, first, to provide such a boat with a driving-gear of such construction that the motive power may be easily changed into an extra slow and powerful propulsion when so required, as in going on the ground, especially up an incline, and into fast speed for going on water; second, to provide a compact and efficient means whereby a boat can be steered without the employment of a rudder, such operation being produced by means which are also employed for regulating the speed of the boat in general.

The invention may be regarded as further improvements upon the invention partly disclosed in my United States Patent No. 780,375, issued January 17, 1905, and further partly disclosed in my Canadian Patent No. 94,056, issued on July 4, 1905.

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 variable-speed device being operable by any suitable motive power.

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, in which—

Figure 1 is a side elevation of a boat having my improved steering and propelling mech-

anism 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 *a a*, 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, at 4 and 4<sup>x</sup>, the ends of 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.

The rear end of each float is provided with a large beveled gear 7 and a smaller beveled gear 7<sup>x</sup>, meshing, respectively, with beveled pinions 8<sup>x</sup> and 8, revolubly arranged upon the lower end of an upright shaft 9, journaled in the hanger 3, and having above the platform a beveled gear 10. It also carries on a feather-key a slidable clutch member 51, having at both ends teeth 52 53, by which to engage similar teeth on the gears 8 and 8<sup>x</sup> and rotate alternately either of them. Said clutch is shifted by a bell-crank lever 54, pivoted at 55 and operated by a rod 56, and a rocker-arm 57 of a rock-shaft 58, journaled in bearings 59, secured under the platform 1. Said shaft is rocked by a hand-lever 60, secured thereon and having a finger-lever 61, operating a latch 62, engaging alternately the notches 63 in the sector 64, fixed upon the platform. By these means the two clutch members 51 are operated simultaneously.

The gears 10 mesh with gears 11, connected to the outer ends of horizontal shafts 12 and 12<sup>a</sup>. These shafts are journaled in bearings 50 and are arranged in alinement with each other and their inner ends 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<sup>a</sup>, 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 19 are also secured to the inner portions of the shafts, and said gears mesh with opposite sides of the gears 17. Flanges 20 are ar-



ranged about hub 15 and have grooves 21 in their inner faces, in which are arranged rings 22, formed of coil-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. Guided in circular grooves in the flanges 26 are, interposed between these flanges and the rings 24, rollers 26, journaled in radial studs 27<sup>x</sup> of rings 27<sup>x</sup>, which keep the rollers the proper distance apart. 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 31 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 34 pivoted to the 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 pivoted 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 the 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<sup>a</sup> will be rotated together. When it is desired to retard the rotation of the shafts 12 and 12<sup>a</sup>, this can be readily done by drawing the arm 42 toward the handle 39, so as to spread the 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<sup>a</sup>. If it is desired to rotate the shafts 12 and 12<sup>a</sup> 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 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<sup>a</sup> are connected by the gears 10 and 11 and shaft 9 and gears 6 and 7 with the floats 5, it will be understood that when the two shafts 12 and 12<sup>a</sup> 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<sup>a</sup> 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, except as to the extra change in the speed which is caused by moving the hand-lever 60.

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. In a machine of the class described, the combination with a suitable frame and platform, of a pair of revoluble tapering floats or drums having their ends journaled in the frame, worms or spirals upon the floats to move them forward on ice, snow or water, a small and a large bevel-gear at one end of each float, a vertical shaft adjacent thereto, the same extending to a driving mechanism upon the platform, two gears revoluble on the vertical shaft and meshing with the small and large gear on the float and having



clutch-teeth at their adjacent sides, a slidable clutch member on the vertical shaft between the gears thereon, and a rock-shaft and lever mechanism for throwing and holding the clutch member engaged with either of the two gears, for the purpose set forth.

2. In a machine of the class described, the combination with a suitable frame and platform, of a pair of revoluble tapering floats or drums having their ends journaled in the frame, worms or spirals upon the floats to move them forward on ice, snow or water, a small and a large bevel-gear at one end of each float, a vertical shaft adjacent thereto, a driving mechanism mounted on the platform and connected with said vertical shaft, two gears revolubly mounted on the vertical shaft and meshing one with the large and the other with the small gear on the float, and

having clutch-teeth on their adjacent sides, a slidable clutch member on the vertical shaft between the two gears thereon, a lever mechanism for throwing and holding the slidable clutch members simultaneously into engagement with either the upper or the lower gears on both of the vertical shafts, and a variable-speed mechanism driving the vertical shafts when driven by the driving mechanism; said variable-speed mechanism being adapted to run the two floats at even and at varied speeds, so as to thereby steer the boat, substantially as shown and described.

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

GUSTAF NELSON.

Witnesses:

A. M. CARLSEN,  
E. C. CARLSEN.