No. 673,584. Patented May 7, 1901.

G. W. PROUTY.

HAND PROPELLING MECHANISM FOR BOATS.

(Application filed Mar. 24, 1900. Renewed Dec. 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

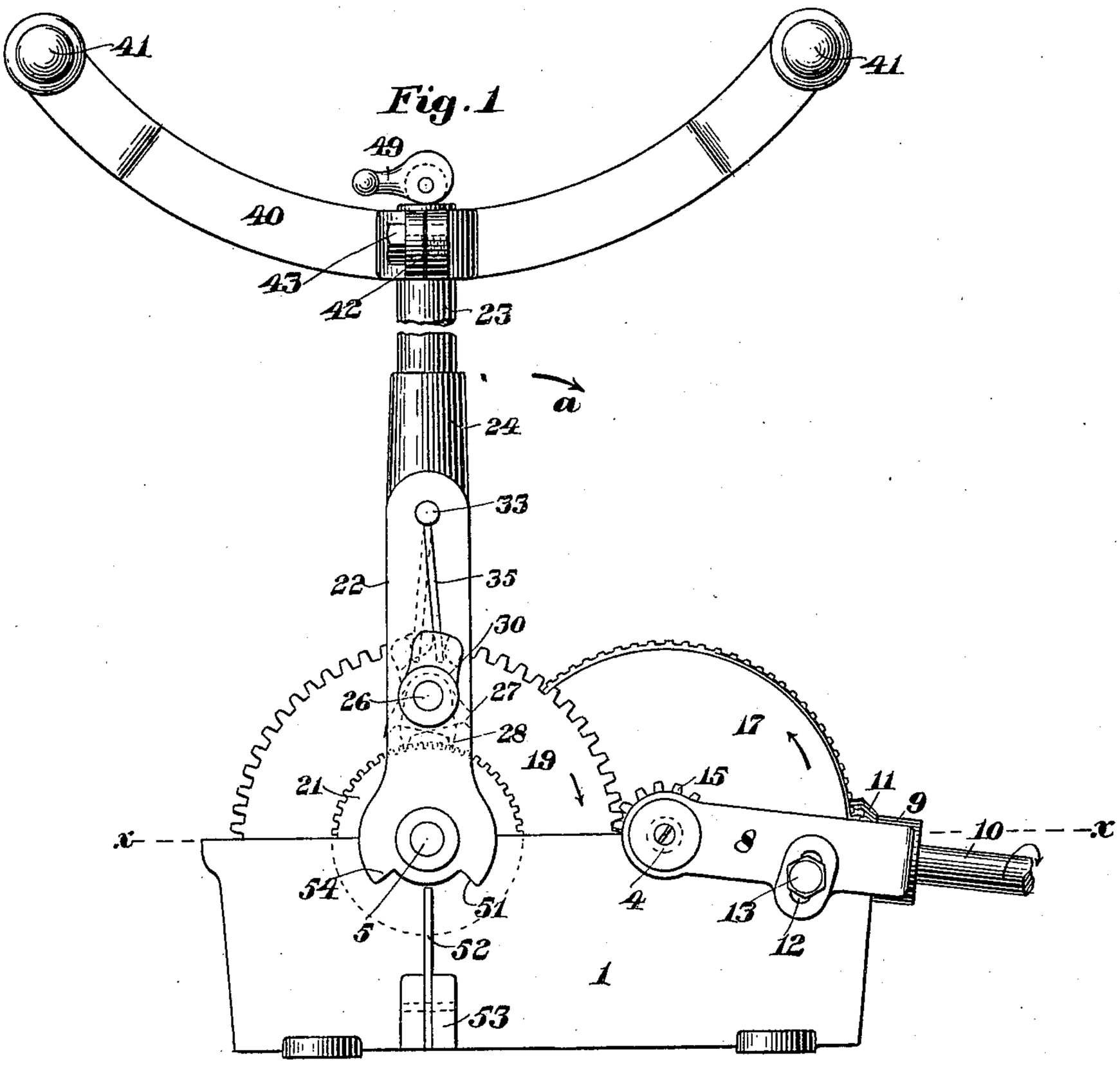
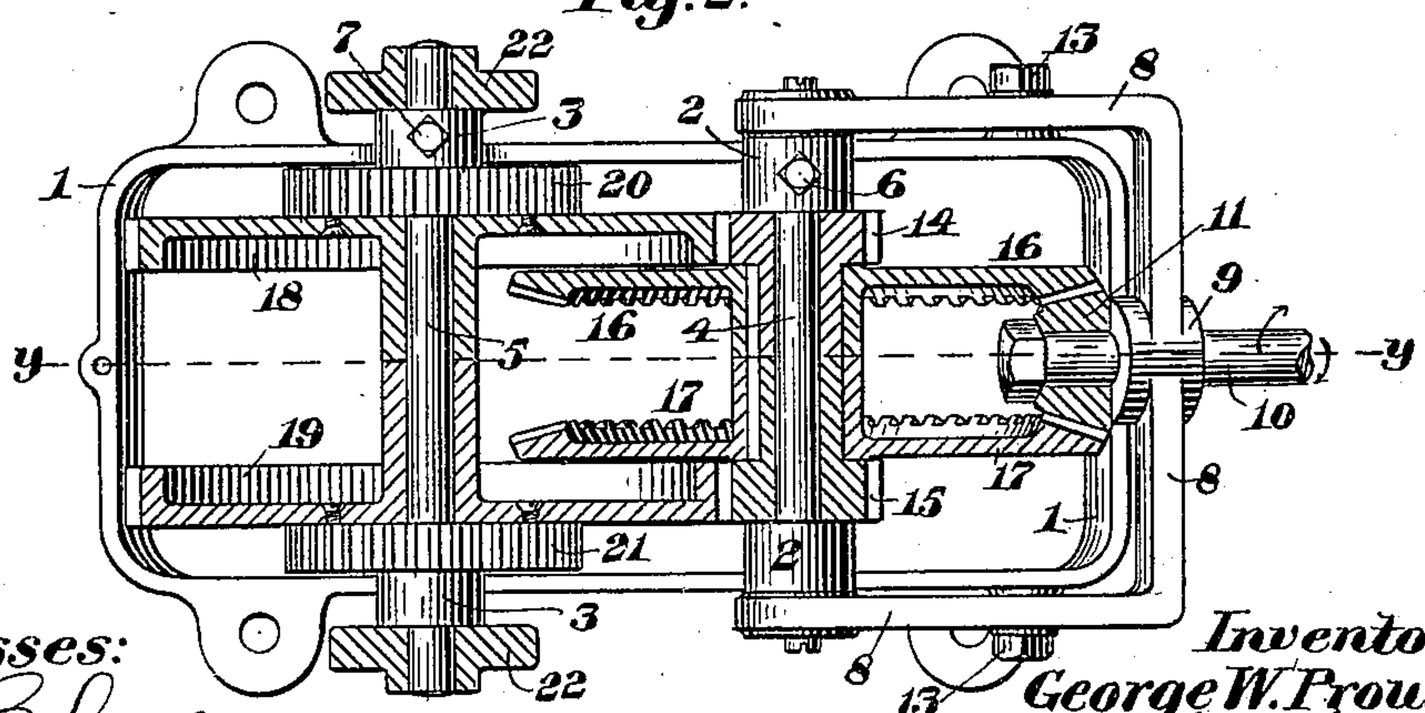


Fig. 2.



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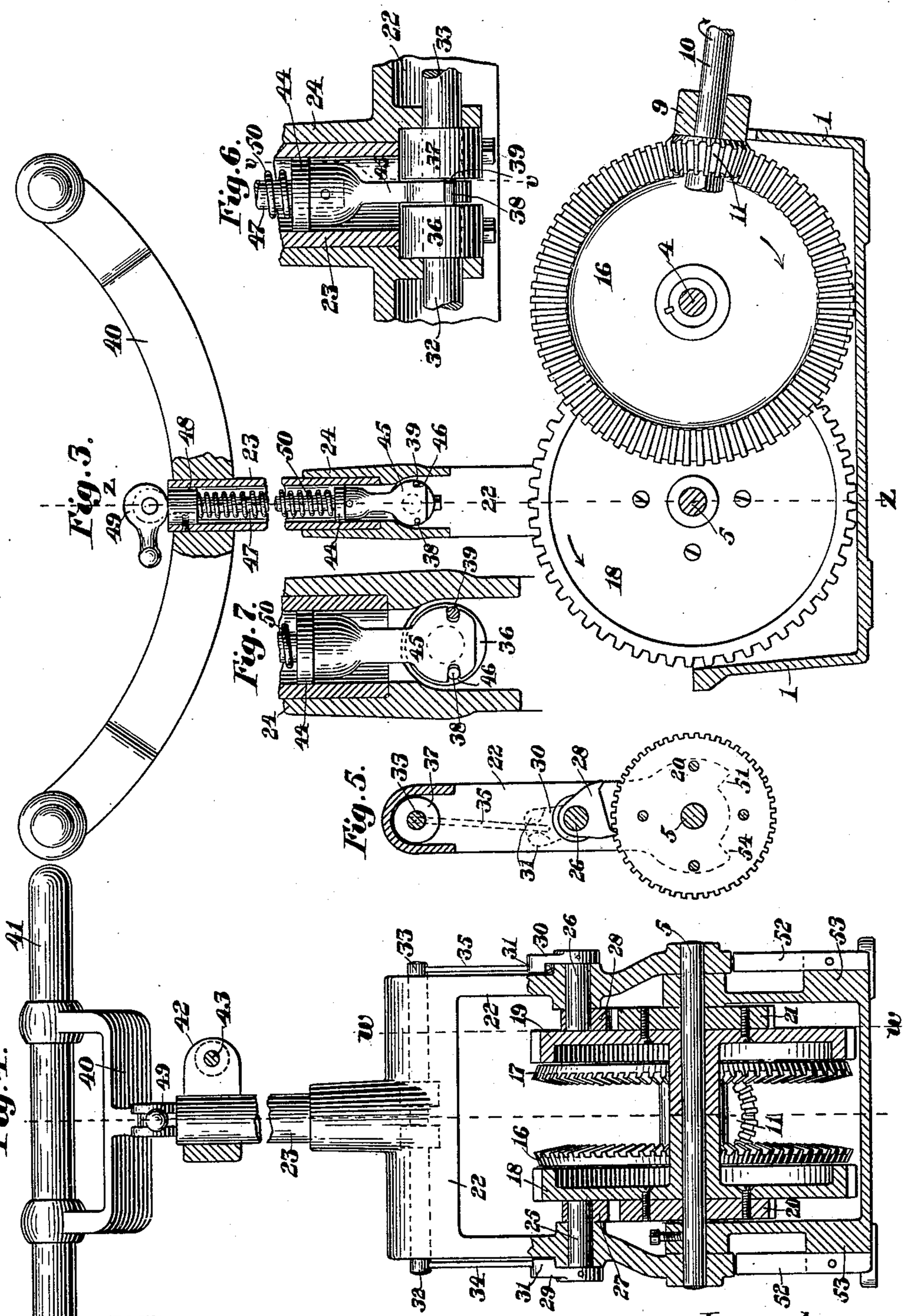

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UNITED STATES PATENT OFFICE.

GEORGE W. PROUTY, OF BOSTON, MASSACHUSETTS.

HAND PROPELLING MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 673,584, dated May 7, 1901.

Application filed March 24, 1900. Renewed December 13, 1900. Serial No. 39,763. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. PROUTY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Hand Propelling Mechanisms for Boats, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to hand propelling mechanisms for boats, and is an improvement upon the invention shown and described in another application of mine filed October 30, 1899, Serial No. 735,196; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a side elevation of a hand propelling mechanism for boats embodying my invention. Fig. 2 is a sectional plan of same, the cutting-plane being on line *x x* on Fig. 1. Fig. 3 is a sectional elevation, the cutting-plane being on line *y y* on Fig. 2. Fig. 4 is a vertical transverse section on line *z z* on Fig. 3 looking toward the right of said figure and showing portions of the operating parts in elevation. Fig. 5 is a partial vertical section on line *w w* on Fig. 4 and showing one of the ratchet-wheels, a portion of the operating-lever, and a pawl for operating said wheel in elevation; and Fig. 6 is a partial vertical section on line *z z* on Fig. 3, drawn to an enlarged scale and illustrating portions of the reversing mechanism. Fig. 7 is a section on line *v v* on Fig. 6.

In the drawings, 1 is a tank-like frame to be firmly secured in a fixed and central position in the bottom of the boat, (not shown,) which may be of any style and size that is ordinarily propelled by oars.

The frame 1 has formed in the upper edges of its side walls suitable bearings 2 2 and 3 3, in which are secured in fixed positions the shafts 4 and 5, which are prevented from revolving by the set-screws 6 and 7 or in any other well-known manner.

The shafts 4 and 5 project outward beyond the outer faces of the bearings 2 2 and 3 3, respectively, and the shaft 4 has loosely mounted upon its outwardly-projecting portions the U-shaped yoke 8, provided with the central hub 9 in a bearing in which is mounted the inner end of the propeller-shaft 10, which has secured thereon inside of said bearing the bevel-pinion 11, as shown.

The yoke 8 has formed in each side arm a slot 12 to receive a clamping-bolt 13, which is screwed into a threaded hole in the frame 1 and serves to clamp said yoke to said frame in a fixed position and permit a slight adjustment of said yoke about its pivotal connection to the shaft 4 to correct any inaccuracy in the alinement of the shaft 10.

The shaft 4 has fitted thereto and freely revoluble thereon the two spur-pinions 14 and 15, upon the hubs of which are firmly secured, so as to revolve therewith, the bevel gear-wheels 16 and 17, respectively, which engage with opposite sides of the bevel-pinion 11, as shown in Fig. 2.

The shaft 5 has mounted thereon, so as to be freely revoluble in either direction about said shaft, the two spur gear-wheels 18 and 19, which engage, respectively, the pinions 14 and 15, as shown in Figs. 1 and 2.

The gears 18 and 19 have secured to their outer faces the ratchet-wheels 20 and 21, respectively, the teeth of which are formed to be acted upon by pawls to move them in either direction about the shaft 5.

The shaft 5 has fitted upon its projecting end portions, so as to be movable about said shaft, the lower ends of the forked operating-lever 22, the central upwardly-projecting arm of which is composed of a tube 23, set in the tubular hub 24, as shown in Fig. 3.

The downwardly-projecting arms of the lever 22 have mounted in suitable bearings therein the short shafts 25 and 26, upon the inner ends of which are secured the double-acting pawls 27 and 28, respectively, and upon their outer ends the arms 29 and 30, respectively, said parts being shown in dotted lines in Fig. 1 and in full lines in Figs. 4 and 5.

The pawls 27 and 28 are each provided with two ratchet-engaging points or teeth upon their lower ends, arranged radially to the axes of their shaft and at a distance from each other of about sixty degrees, more or less.

The arms 29 and 30 project upward from the shafts 25 and 26, respectively, and are each provided with two inwardly-projecting

lugs or pins 31. (Shown in dotted lines in Fig. 5.)

The horizontal portion of the lever 22 is concavo-convex in cross-section and has mounted in suitable bearings therein the two shafts 32 and 33 in axial line with each other, the outer ends of which project through said lever, and each has set therein or firmly secured thereto a pendent spring-arm 34 or 35, the lower ends of which project between the lugs or pins 31, as shown.

The inner ends of the shafts 32 and 33 have secured thereon the disks 36 and 37, respectively, in the inner faces of which are set the crank-pins 38 and 39, respectively, arranged on opposite sides of and equidistant from the axes of the shafts 32 and 33, as shown in Fig. 7.

The upper end of the tubular arm 23 has adjustably mounted thereon the two-armed lever 40, the opposite ends of which are forked and have fitted to suitable bearings therein the horizontal handle-bars 41, which project beyond the arms of said forks, as shown in Fig. 4.

The center of the lever 40 is provided with a hub bored out to fit the outer diameter of the tube 23, cut through on one side and provided with the ears 42, in one of which is threaded the clamping-bolt 43 in such a manner as to clamp said hub firmly upon said tube at any desired height above the upper end of the hub 24, to adapt said handle-bars to the height of the persons for the time being operating the boat.

The tube 23 has fitted therein the piston 44, from which depends the flat plate-like projection 45 between the disks 36 and 37, and has formed in each edge thereof a slot 46, one of which engages the crank-pin 38 and the other the crank-pin 39, as shown.

The piston 44 has set therein the rod 47, which projects upward through the collar 48, and has pivoted thereto, above the upper end of said tube 23, the reversing-lever 49, said rod being surrounded between said piston 44 and collar 48 by the coiled spring 50, as shown in Fig. 3.

The operation of my invention is as follows: When it is desired to propel the boat forward, the reversing-lever 49 is in the position shown in the drawings, with its free end pointing toward the bow of the boat, and the several other parts of the mechanism are in the position shown in the drawings. Now if one or more persons seize the handle-bars and move the lever 22 in the direction indicated by the arrow *a* on Fig. 1 the rearward tooth of the pawl 28 acting upon the teeth of the ratchet-wheel 21 will cause the gears 18 and 19 and the propeller-shaft 10 to be moved about their axes of revolution in the directions indicated by the arrows on said parts in Fig. 1, while the gears 16 and 17 and the ratchet-wheel 20 revolve in the opposite directions, the teeth of said ratchet-wheel 20 passing under and slightly vibrating the forward tooth of the pawl 27 without being affected thereby. When the rearward motion of the levers 22 and 40 has continued until the shoulders 51, formed in the lower ends of the lever 22, come in contact with the spring stop-arms 52, set in or secured to lugs 53, formed on the side walls of the frame 1, the motion in that direction ceases and said levers are moved in the opposite direction, when the forward tooth of the pawl 27 will engage a tooth of the ratchet-wheel 20, causing all the wheels and the propeller-shaft to continue to revolve in the same directions as before, the teeth of the ratchet-wheel 21 passing beneath and slightly vibrating the rear tooth of the pawl 28 without being affected thereby. When the forward movement of said levers 22 and 40 has continued until the shoulders 54 on the lower ends of the arms of the lever 22 come in contact with the spring stop-arms 52, the movement of said levers in that direction is arrested without a shock by virtue of a slight yielding of said stop-arms 52 and another rearward stroke of said levers is begun. These alternate movements of the levers 22 and 40 are continued without readjustment of any of the parts of the mechanism as long as it is desired to propel the boat forward. If it is desired to reverse the motion of the propeller in order to check or arrest the forward movement of the boat to avoid a collision or for other reason, the operator without changing or even checking the movement of the handle-bars and the lever 22 simply reverses the position of the lever 49, so that its free end points toward the stern of the boat, which action owing to the fact that the pivoted end of said lever 49 is made eccentric raises the rod 47, the piston 44, and slotted plate 45, which latter, acting upon the crank-pins 38 and 39, set in the disks 36 and 37, respectively, causes the shafts 32 and 33 to be moved about their axes in opposite directions to a limited extent, thereby causing lateral movements of the lower ends of the spring-arms 34 and 35, which acting upon the lugs 31 causes movements of the pawls 27 and 28 about their axes of motion in opposite directions, thereby bringing into action the teeth of said pawls that were previously inoperative.

This reversing mechanism is a very effective and useful device, will not easily get out of order, and is an important feature of my invention, as are also the yielding stop-arms 52 and shoulders 51 and 54 on the operating-lever 22, whereby the limit of stroke of said lever is determined and the arresting of its movement in either direction is cushioned.

Another valuable feature of my invention is the adjustable yoke 8, whereby the proper alinement of the shaft 10 may be effected when the frame 1 is improperly set so as to be slightly out of proper alinement with the bearing of said shaft in the stern part of the boat.

I am aware that it is not new to impart to a propeller-shaft a continuous rotary motion

in the same direction by means of a double set of gearing and ratchet-and-pawl mechanisms acting alternately upon said shaft and operated by a vibrating lever, and therefore I do not claim, broadly, such an arrangement of mechanism; but

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a boat propelling mechanism comprising a screw-propeller, its shaft and a double set of gearing and ratchet-wheels constructed and arranged to alternately act upon said shaft to revolve it, a vibratory lever provided with a suitable handle-bar adapted to be operated by one or more persons; a pair of double-toothed pawls pivoted to opposite sides of said lever and arranged to alternately engage a ratchet-wheel to transmit motion through said gearing to said propeller-shaft to revolve it in a direction to move said boat forward; a single reversing-lever mounted on the upper end of said vibratory operating-lever; and connecting mechanism between each of said pawls and said reversing-lever whereby a single movement of said reversing-lever will reverse both of said pawls and cause said propeller-shaft to be revolved in the opposite direction.

2. As a means of reversing the motion of a propeller-shaft, to which motion is imparted through two trains of gearing acting alternately upon opposite sides thereof, the combination of the ratchet-wheels 20 and 21 secured one to each of said trains of gearing; the vibratory operating-lever 22, 23; the double-toothed pawls 27 and 28; the arms 29 and 30 provided with the lugs 31; the shafts 32 and 33; the spring-arms 34 and 35; the disks 36 and 37 carried by said shafts 32 and 33; the crank-pins 38 and 39; the piston and plate 44, 45, provided with slots to engage said pins 38 and 39; the rod 47; collar 48; the lever 49; and spring 50 all constructed arranged and operating substantially as described.

3. In a boat propelling mechanism comprising a screw-propeller, its shaft, two trains of gearing arranged to act alternately upon opposite sides of said shaft to revolve it, a ratchet-and-pawl mechanism connected to and adapted to operate each of said trains of gearing; a vibratory operating-lever carrying said pawls and provided with the stop-shoulders 51 and 54; in combination with the yielding stop-arms 52 constructed and arranged as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 22d day of March, A. D. 1900.

GEORGE W. PROUTY.

Witnesses:
N. C. LOMBARD,
J. HOUSTON STEVENSON.