

I. B. BOLKA.
 PROPELLER OPERATING MECHANISM.
 APPLICATION FILED OCT. 26, 1900.

1,001,984.

Patented Aug. 29, 1911.
 9 DESIGNS—SHEET 1.

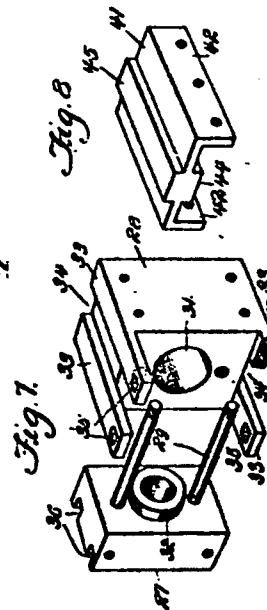
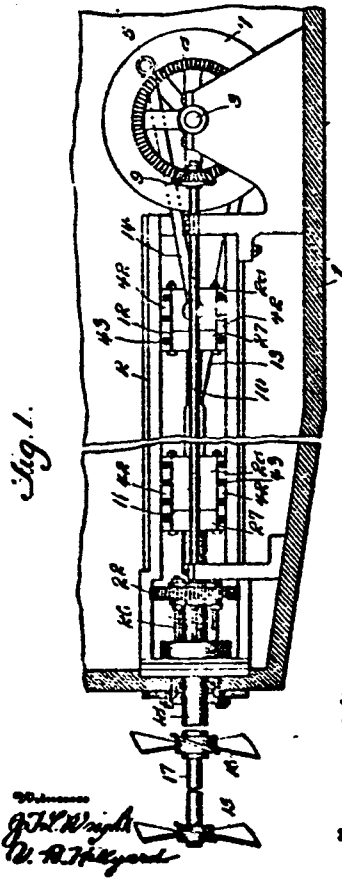


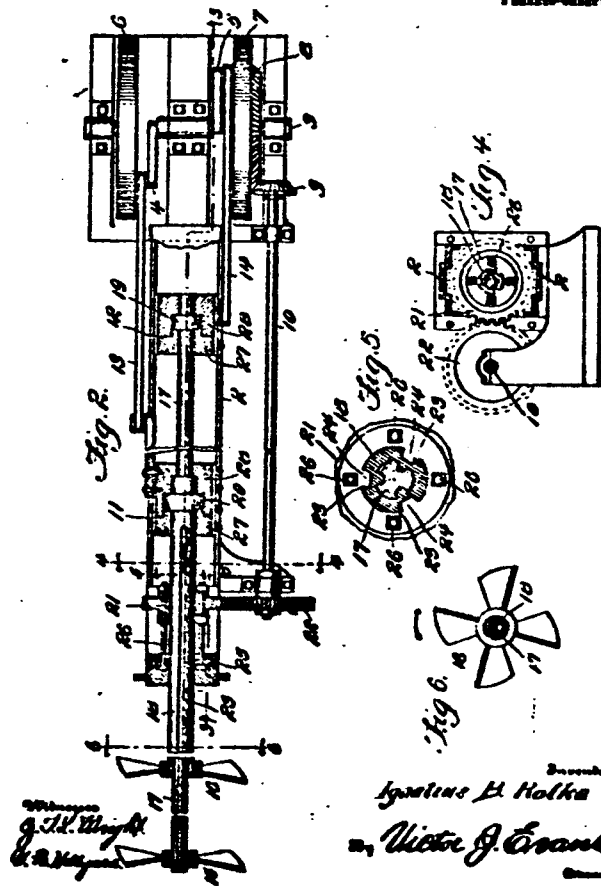
Fig. 9.

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I. B. BOLKA.
 POWELLER OPERATING MEANS.
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SHEET 2

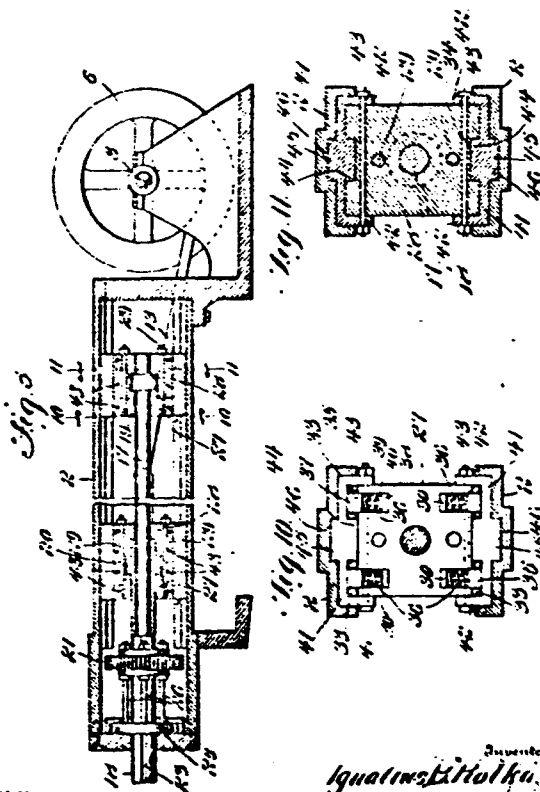


Fig. 5
7-12-11 right.
V. B. Holka.

Fig. 11
Ignatius Holka
Victor J. Evans

1001984

1,001,984. PROPELLER - OPERATING MEANS. IGNATIUS B. ROLKA, Gallitzin, Pa., assignor of one-half to William Lawn, Gallitzin, Pa. Filed Oct. 19, 1910. Serial No. 587,994.

To all whom it may concern:

Be it known that I, IGNATIUS B. ROLKA, a citizen of the United States, residing at Gallitzin, in the county of Cambria and State of Pennsylvania, have invented new and useful Improvements in Propeller-Operating Means, of which the following is a specification.

This invention has relation to means intended more particularly for propelling boats and vessels of kindred nature designed to be operated upon water ways.

The primary purpose of the invention is to impart a combined rotary and reciprocating movement to the propeller of boats so as to obtain the combined effect of both movements and thereby secure a maximum percentage of effective work from a given power.

The invention further contemplates the mounting of propellers so as to aline and to impart a two-fold movement to each, the propellers being mounted so that when one is advancing the other is returning to a given position, both propellers reciprocating simultaneously in opposite directions.

The invention aims to provide bearings to impart a reciprocating movement thereto and to provide concentric shafts having interlocking means to cause both to rotate in unison, each of the shafts being supplied with a propeller and having connection with one of the bearings so as to turn therein and to reciprocate therewith.

The invention further provides peculiar means for imparting rotary movement to one of the shafts simultaneously with its reciprocating movement, said rotary movement being imparted to the other shaft through the interlocking means between the two shafts.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawings, and pointed out in the appended claims.

Referring to the drawings, forming a part of the specifications, Figure 1 is a side view of boat propelling means embodying the invention, showing a portion of the boat in section, an intermediate portion being broken away. Fig. 2 is a top plan view of the propelling mechanism, showing the hubs of the propellers, the bearings for the shafts and a part of the framework in horizontal section. Fig. 3 is a vertical longitudinal section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2, look-

ing to the left. Fig. 5 is a detail section on the line 5—5 of Fig. 2, showing the center portion of the gear in which the propeller shaft is slidably mounted and keyed so as to rotate with said gear. Fig. 6 is a section on the line 6—6 of Fig. 2, looking to the left. Fig. 7 is a detail perspective view of one of the bearings, the parts being separated. Fig. 8 is a detail perspective view of one of the tie plates. Fig. 9 is a detail perspective view of a spring connector. Fig. 10 is a section on the line 10—10 of Fig. 3, looking to the right. Fig. 11 is a section on the line 11—11 of Fig. 3, looking to the left.

Corresponding and like parts are referred to in the following description, and indicated in all the views of the drawings, by the same reference characters.

The numeral 1 indicates part of the hull of a boat or other vessel for plying the water, the same being equipped with a propelling mechanism illustrating the application of the invention.

The numeral 2 designates a frame, which is secured to the vessel and forms a support for the working parts. A shaft 3 is mounted transversely of the forward end of the frame 2 and is adapted to be driven in any manner and has crank portions 4 and 5 which are oppositely disposed. Fly wheels 6 and 7 are mounted upon the shaft 3 and one of the fly wheels, as 7, is provided upon its outer side with bevel gear 8, which is in mesh with a bevel pinion 9 secured to the forward end of a longitudinal shaft 10. Bearings 11 and 12 are slidably mounted upon the frame 2 and are connected by pitmen 13 and 14 with the respective cranks 4 and 5. The pitmen are arranged upon opposite sides of the frame 2 so as not to interfere with each other by reason of the opposite arrangement of the cranks 4 and 5. The bearings 11 and 12 receive a reciprocating movement in reverse directions with the result that when one of the propellers is moving rearward the other is returning to a given position preliminary to having a rearward movement imparted thereto. The bearings 11 and 12 are of similar construction, that is each is formed of complementary parts which are secured together and between which an annular enlargement of the propeller shaft is held to cause said shaft to reciprocate with the bearing while at the same time the shaft is free to rotate in the bearing.

The propellers 15 and 16 may be of any make or type and are secured to the outer or rear ends of propeller shafts 17 and 18 which have a concentric arrangement, the shaft 17 passing through the shaft 18 which is hollow. The shaft 17 is considerably longer than the shaft 18 and is preferably

solid and fits snugly within the shaft 18 and is secured thereto for rotation therewith. Interlocking means are provided between the two shafts 17 and 18, the same consisting of a tongue and groove, the shaft 17 having a series of longitudinal grooves in its outer side and the shaft 18 having a corresponding number of longitudinal tongues to fit snugly within the grooves. While the shafts 17 and 18 have a snug fit they are free to move longitudinally one upon the other. The shaft 17 is mounted at its front end in the bearing 12 and has an annular enlargement 19 which is confined between the two parts of the bearing so that the shaft is compelled to reciprocate with the bearing when the latter is moved rectilinearly. The shaft 18 has an annular enlargement 20 near its forward end which is confined between the two parts of the bearing 11 to cause said shaft and bearing to move together when the bearing is reciprocated. The shaft 18 obtains an additional bearing in the rear end of the frame 2 and within the stuffing box applied to the stern of the boat.

Rotary movement is imparted to one of the propeller shafts. In the preferred construction the shaft 18 is positively driven and has a gear wheel 21 mounted thereon, said gear wheel being held in a given plane and having interlocking connection with the shaft 18 to impart a rotary movement thereto simultaneously with the reciprocating movement. The gear wheel 21 meshes with a gear wheel 22 secured to the rear end of the longitudinal shaft 10. The shaft 18 has a series of longitudinal grooves 23 in its outer side and the gear wheel 21 has a corresponding series of ribs 24 extending into its opening to fit the grooves 23 and thereby form interlocking means between the gear wheel and shaft. Any means may be resorted to for holding the gear wheel 21 in a given plane and as illustrated a collar 25 is confined between parts of the frame and fits loosely upon the shaft 18 and bolts or tie rods 26 connect said collar with the hub portion of the gear wheel 21. The collar 25 and gear wheel 21 rotate together and the distance between the two may be varied to insure proper alinement of the gear wheels 21 and 22. Each of the propeller shaft bearings comprises parts 27 and 28 which are separable and adapted to be secured by means of bolts 29 and connectors 30. One of the parts, as 28, has the inner end of its opening enlarged, as indicated at 31, to receive the annular enlargement of the propeller shaft and the other part 27 has a boss 32 in line with the opening to enter the opening 31 and confine the enlargement of the propeller shaft fitting therein. The part 28 has longitudinal extensions 33 at its

top and bottom, said extensions being spaced apart, as indicated at 34. The extensions 33 project a distance to overlap the ends of the part 27 and are formed with vertical openings 35 which receive the outer ends of the spring connectors 30. The outer side of the part 27 has recesses 36 in its upper and lower portions to receive the spring connectors 30. Each of the spring connectors 30 comprises blocks 37 and 38, a pin 39 and a helical spring 40 of the expansible type mounted upon the pin 39 and interposed between the blocks 37 and 38 to force the same apart. The pin 39 is fixed to the block 38 and enters an opening formed in the block 37, the latter being movable upon the pin 39 toward and away from the block 38. When the spring connectors are in position they fit within the recesses 36 of the part 27 and the blocks 37 enter the openings 35 formed in the projecting ends of the longitudinal extensions 33, as indicated most clearly in Fig. 10, thereby securing the parts 27 and 28. Tie plates 41 are fitted to the upper and lower sides of each of the bearings 11 and 12 and each tie plate has flanges 42 at its opposite longitudinal edges which embrace opposite sides of the bearings, said flanges having openings which register with corresponding openings of the parts of the bearing and through which bolts 43 pass. The tie plates have inner longitudinal ribs 44, which fit in the spaces 34 formed between the longitudinal extensions 33 and have outer longitudinal ribs 45 which fit within longitudinal grooves 46 formed in the inner faces of upper and lower members of the frame 2 and which members constitute ways between which the bearings 11 and 12 are slidably mounted.

In the operation of the mechanism rotary movement is imparted to the shaft 3 from any source and the bearings 11 and 12 are caused to reciprocate and the shaft 10 to rotate and by reason of the connections herein specified the shafts 17 and 18 have a combined rotary and rectilinear reciprocating movement imparted thereto in such a manner so that when the propeller 15 is moving rearward the propeller 16 is moving forward and vice versa. This manner of operating the propellers results in utilizing a maximum percentage of the power initially developed for efficient work in driving the boat or vessel.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the embodiment thereof,

I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

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

1. In a propeller mechanism, the combination of two shafts one mounted upon the other and adapted to interlock therewith, whereby both shafts are adapted to rotate together but are free to have a longitudinal movement imparted thereto, a propeller secured to each of the shafts, means for imparting a reciprocating movement to each of the shafts independently of the other shaft, and means for imparting a rotary movement to one of the shafts.

2. In propelling mechanism, the combination of concentric shafts mounted to reciprocate and to rotate, interlocking means between the two shafts to cause them to turn together, propellers secured to the respective shafts, alined slides, means connecting the shafts with the respective slides, means for imparting a reciprocating movement to the slides to cause them to operate simultaneously in reverse directions, a gear wheel mounted upon one of the shafts and having interlocking connection therewith, and means for imparting a rotary movement to said gear wheel.

3. In propeller mechanism, the combination of a shaft provided with a propeller and mounted to receive a combined rotary and longitudinal movement, a bearing for the shaft composed of two parts between which a portion of the shaft is confined, one of said parts having apertured extensions to overlap the other part, the last mentioned part having openings, and springs connectors fitted in the openings of the last mentioned part and adapted to engage the openings formed in the extensions of the first mentioned part.

4. In propelling mechanism, the combination of a shaft provided with a propeller and mounted to receive a combined rotary and longitudinal movement, a bearing for the shaft composed of parts between which a portion of the shaft is confined, said bearing having longitudinal grooves in opposite sides, and tie plates connecting the parts of the bearing and having inner and outer longitudinal ribs.

5. In propelling mechanism, the combination of concentric propeller shafts, interlocking means between the shafts to cause them to rotate together and to admit of their having independent reciprocating movement, alined bearings for the respective shafts, a power shaft having crank portions, connecting means between the crank portions of the power shaft and the respective bearings

to impart a reciprocating movement to the latter, a gear wheel mounted upon one of the propeller shafts and having interlocking connection to rotate therewith, and connecting means between said power shaft and gear wheel for imparting rotary movement to the latter.

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

IGNATIUS B. ROLKA.

Witnesses:

J. R. CAMPBELL,

M. J. BRACKEN.