No. 849,719. PATENTED APR. 9, 1907.

W. E. BLAIR.

PROPELLER ADJUSTING DEVICE.

APPLICATION FILED FEB. 23, 1906.

2 SHEETS—SHEET 1.

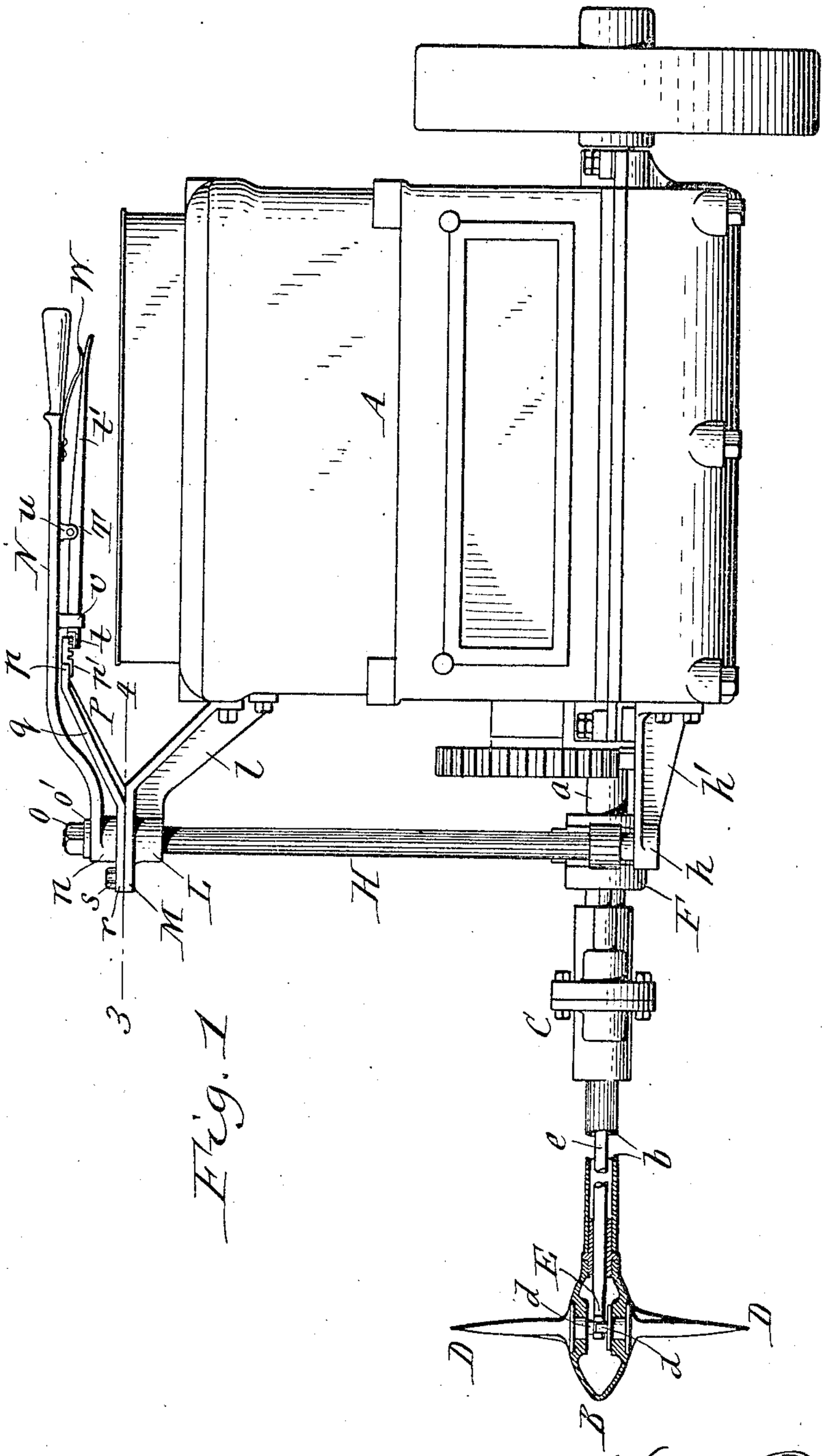

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

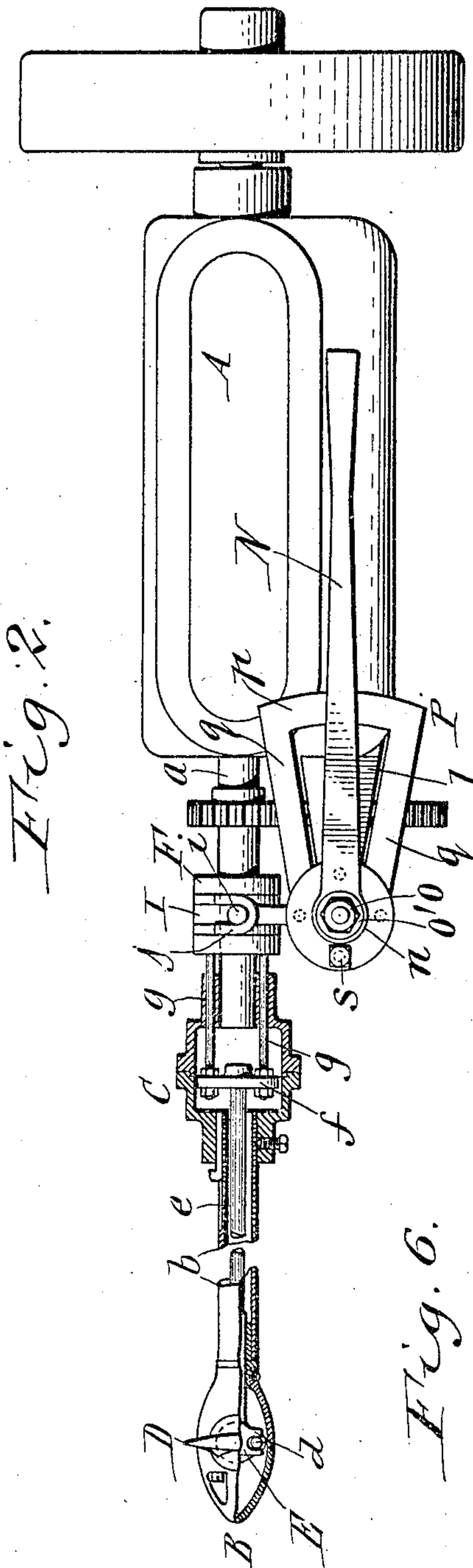


Fig. 7.

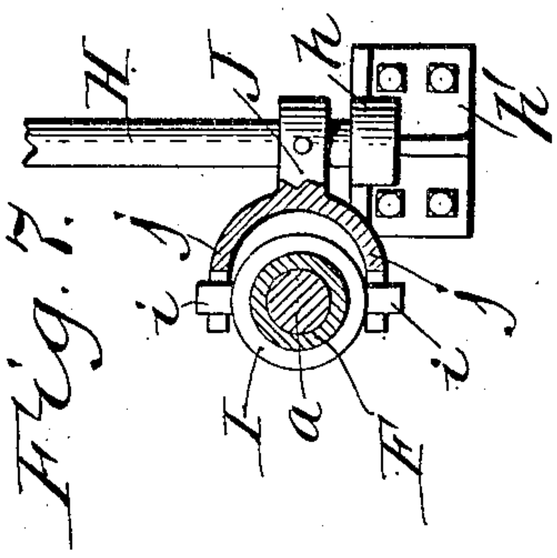


Fig. 3.

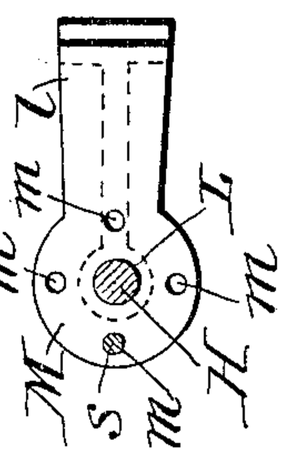


Fig. 4.

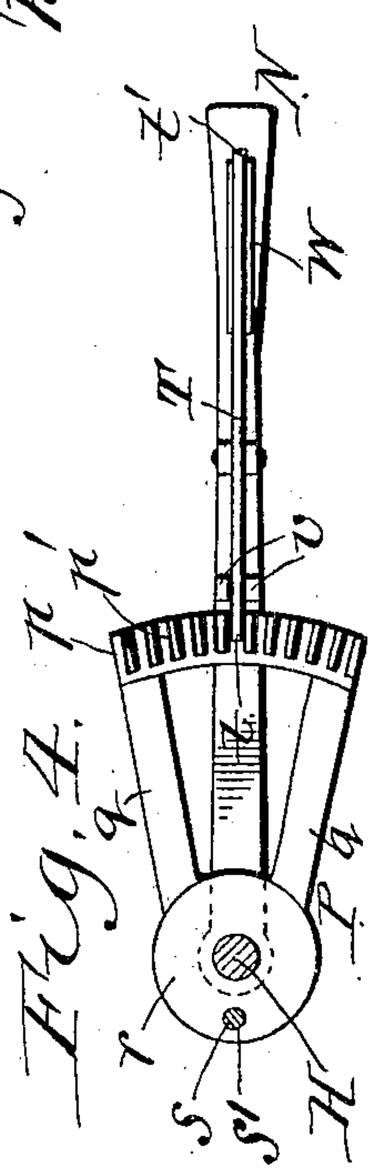


Fig. 6.

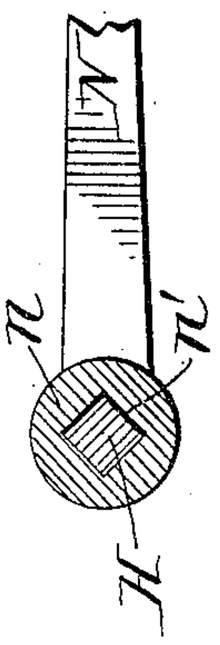
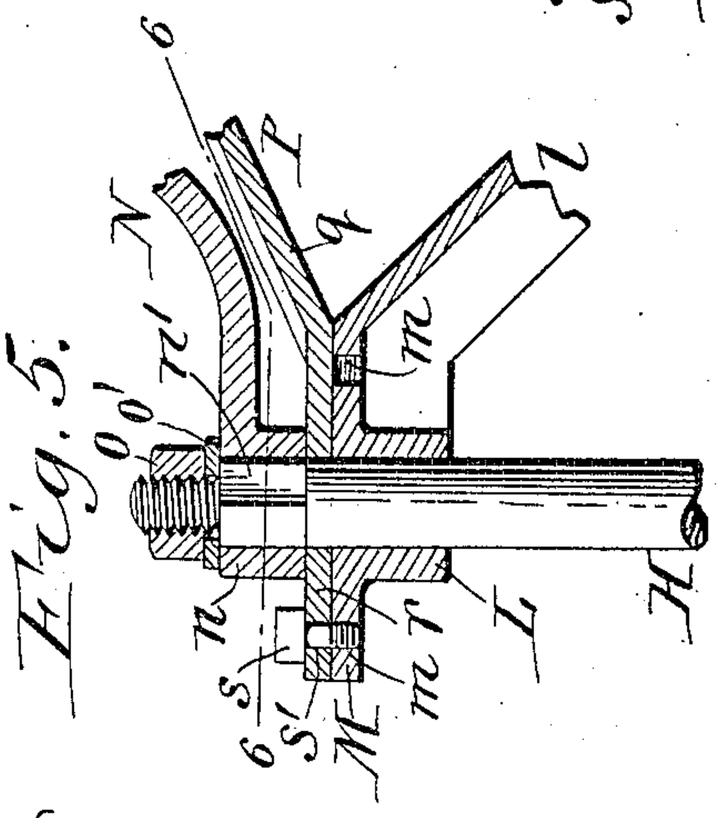


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM E. BLAIR, OF BUFFALO, NEW YORK, ASSIGNOR TO BUFFALO GASOLENE MOTOR COMPANY, OF BUFFALO, NEW YORK.

PROPELLER-ADJUSTING DEVICE.

No. 849,719. Specification of Letters Patent. Patented April 9, 1907.

Application filed February 23, 1906. Serial No. 302,356.

To all whom it may concern:

Be it known that I, WILLIAM E. BLAIR, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Propeller-Adjusting Devices, of which the following is a specification.

This invention relates to a propeller-adjusting device for boat-motors.

The object of this invention is to provide simple and convenient means whereby the hand-lever of the propeller-adjusting device and the locking mechanism therefor may be readily shifted into different positions relatively to the adjusting-shaft in order to adapt the adjusting device to the particular part of the boat on which the motor is mounted and to permit of using the same more conveniently by persons which are either right handed or left handed without requiring any change in the construction of the parts.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation, partly in section, of my improved adjusting device applied to the reversible propeller of a marine gas-engine. Fig. 2 is a top plan view thereof. Figs. 3 and 4 are horizontal sections taken in line 3 4 and looking in opposite directions. Fig. 5 is a fragmentary sectional elevation, on an enlarged scale, of the upper part of the adjusting-shaft and the adjacent part of the propeller-adjusting device. Fig. 6 is a horizontal section in line 6 6, Fig. 5. Fig. 7 is a fragmentary transverse section of the lower part of the adjusting-shaft and the adjacent parts of the propeller-adjusting device.

Similar letters of reference indicate corresponding parts throughout the several views.

A represents an upright marine motor or gas-engine, which may be of any suitable construction and provided with a longitudinal horizontal driving or crank shaft *a* in its lower part. B represents the hollow hub of the propeller, which is connected with the rear end of a hollow propeller-shaft *b*. The opposing rear end of the engine-shaft and the front end of the propeller-shaft are connected by a hollow coupling C. D represents the propeller-blades, which are journaled on the hub and provided within the latter with crank pins or wrists *d*, which are engaged with a longitudinally-movable shifting head E. F represents a shifting sleeve, which is movable lengthwise on the engine-shaft and operatively connected with the shifting head E by means of a cross-head *f*, movable axially in the hollow coupling C, two shifting rods *g g* connecting the ends of the cross-head with the shifting sleeve and passing through the coupling C on opposite sides of the engine-shaft and a central shifting rod *e* connecting the central part of the cross-head and the shifting head and extending through the hollow propeller-shaft. All of these parts may be of any suitable and well-known construction and form no part of my invention.

H represents an upright adjusting-shaft journaled at its lower end in a bearing *h*, formed on a bracket *h'*, which is secured to the lower part of the engine-frame and operatively connected with the shifting sleeve F by means of a shifting ring I, surrounding the latter between two shoulders thereon and a rock-arm J, secured to the lower part of the adjusting-shaft and having forks *j* engaging with pins *i*, arranged on opposite sides of the shifting ring. Upon rocking this adjusting-shaft toward either side of its central positions the propeller-blades are turned in one direction or the other and cause the boat to move either forward or backward, but when the adjusting-shaft is in its central position the propeller-blades are so turned that they are neutral and have no propelling effect.

L represents a bearing in which the adjusting-shaft is journaled near its upper end and which is formed on the upper end of an inclined bracket *l*, secured at its lower end to the adjacent upper part of the engine-frame. At its upper end the upper bearing L is provided with an annular flange M, which contains a plurality of screw-threaded openings *m*, arranged equidistant and circumferentially around the adjusting-shaft.

N represents a hand-lever, having its hub *n* provided with a flat-sided bore which receives a correspondingly-shaped part *n'* on the adjusting-shaft above its upper bearing. The hub of the hand-lever is held on this flat-sided part of the adjusting-shaft by means of a screw-nut *o*, applied to the upper threaded end thereof and bearing against the upper end of the hand-lever hub by means of an interposed washer *o'*, as shown in Figs. 1 and 5.

The means whereby the propeller-adjust-

ing device is held or locked in the different positions to which the same is shifted are preferably constructed as follows: P represents a locking-segment arranged below the hand-lever and having at its outer end a segmental bar *p*, which is provided with a row of downwardly-projecting locking-teeth *p'*. The locking-segment is provided with radial arms *q*, which are connected at their outer ends with the toothed bar, while their inner ends are connected with a hub *r*, which is mounted upon the adjusting-shaft between the upper end of the upper bearing and the lower end of the hub of the hand-lever. The locking-segment is secured in place by means of a screw *s*, passing through an opening *s'* therein and engaging one of the openings of the flange on the upper bearing L. T represents a locking-lever, which is arranged lengthwise on the under side of the handle and pivoted between its ends to swing vertically on downwardly-projecting lugs *u* on the hand-lever. The inner end or dog *t* of the locking-lever is movable vertically into and out of engagement with the teeth of the bar *p*, during which movement the dog is guided between two lugs *v*, depending from the under side of the hand-lever. The dog is yieldingly held in engagement with the toothed bar by means of a spring W, secured at one end to the hand-lever and bearing at its opposite end against the outer end or handle *t'* of the locking-lever.

When it is desired to adjust the propeller-blades, the locking-lever is first released from the teeth of the segment, after which the hand-lever may be shifted, together with the adjusting-shaft and connecting parts, for bringing the propeller-blades to the desired position. Upon now releasing the locking-lever its dog will be moved by the spring W into engagement with the adjacent teeth of the segment and hold the parts in this adjusted position.

When installing a motor having reversible blades in a boat, it is necessary to shift the hand-lever and locking mechanism relatively to the adjusting-shaft to that position which best suits the construction of the boat and the taste of different operators and also to enable the propeller-adjusting device to be used by right-handed or left-handed persons with equal facility.

For shifting the hand-lever and its locking device relatively to the adjusting-shaft, the hand-lever is first removed, with its hub, from the flat-sided part of the adjusting-shaft and replaced thereon in the desired shifted position, and the locking-segment is turned on the adjusting-shaft to correspond with the changed position of the hand-lever relatively to the adjusting-shaft. The hand-lever may be thus removed from and replaced on the adjusting-shaft by first removing the nut *o* from the adjusting-shaft and restoring the same after the desired shift of the hand-lever relatively to the adjusting-shaft has been effected. The segment may be adjusted by first removing the screw *s* from the opening *m* in the bearing-flange with which it engages and then engaging this screw with another opening *m* for holding the locking-segment in place after the same has been adjusted.

It has been found in practice that the hand-lever of the adjusting device is most always used in a position projecting either toward the bow, toward the stern, toward the port, or toward the starboard of the boat. The flat-sided part of the adjusting-shaft, which engages the bore of the hub of the hand-lever, has therefore been made square, and four openings *m* have been provided in the flange M of the upper bearing L, which parts are so constructed or arranged to permit of shifting the hand-lever and locking-segment into the above-mentioned four positions.

For compactness the adjusting-shaft is arranged comparatively close to the rear side of the motor-frame. In order to permit of projecting the hand-lever and locking-segment forwardly from the adjusting-shaft when the same is arranged close to the engine-frame, the outer parts of the hand-lever and locking-segment are elevated above the inner parts thereof, which permits the outer parts to swing over the top of the engine-frame without interfering therewith while keeping the inner parts thereof comparatively low where they are not in the way and do not cause interference.

My improved propeller-adjusting device permits of constructing and assembling the motors, together with their propellers and adjusting devices, uniformly in the shop, while enabling each operator to readily shift the hand-lever and its locking mechanism into different positions relatively to the adjusting-shaft without requiring any special tools or facilities for this purpose.

I claim as my invention—

1. A propeller-adjusting device comprising a shaft adapted to be operatively connected with a propeller, a hand-lever operatively connected with said shaft and capable of being adjusted into different positions relatively thereto, a segment also adjustable relatively to said shaft, and means for interlocking said hand-lever and segment, substantially as set forth.

2. A propeller-adjusting device comprising a shaft adapted to be operatively connected with the propeller, a hand-lever adjustable circumferentially on said shaft, a segment capable of circumferential adjustment about said shaft, and a dog mounted on said hand-lever and adapted to engage with said segment, substantially as set forth.

3. The combination of a driving-shaft, re-

versible propeller-blades mounted on said shaft, an adjusting-shaft operatively connected with said blades, a hand-lever capable of circumferential adjustment on said adjusting-shaft, a toothed segment capable of circumferential adjustment about said adjusting-shaft, and a locking-dog mounted on said hand-lever and adapted to engage with the teeth of said segment, substantially as set forth.

4. The combination of a driving-shaft, reversible propeller-blades mounted on said shaft, an adjusting-shaft operatively connected with said blades, a bracket having a bearing in which said adjusting-shaft is journaled, a hand-lever capable of circumferential adjustment on the adjusting-shaft, a toothed segment having a hub which receives said adjusting-shaft, means for securing said segment to said bracket in different positions about the adjusting-shaft, and a locking-dog mounted on the hand-lever and engaging with the teeth of said segment, substantially as set forth.

5. The combination of a driving-shaft, reversible propeller-blades mounted on said shaft, an adjusting-shaft operatively connected with said blades and having a square part, a hand-lever having a hub provided with a square opening which receives the square part of said adjusting-shaft, a bracket having a bearing in which said adjusting-shaft is journaled, and an annular flange, a toothed segment having a hub which is arranged on said adjusting-shaft between said flanged bearing and hand-lever hub, a fastening-screw arranged in an opening in the hub of said segment and one of four openings formed in a circumferential row in said flange, and a locking-dog arranged on said hand-lever and engaging with the teeth of said segment, substantially as set forth.

Witness my hand this 20th day of February, 1906.

WILLIAM E. BLAIR.

Witnesses:
GEO. A. JACKSON,
J. H. MEATH.