No. 767,827. PATENTED AUG. 16, 1904.

H. J. NOLL.

ADJUSTABLE FIN FOR VESSELS.

APPLICATION FILED JAN. 30, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

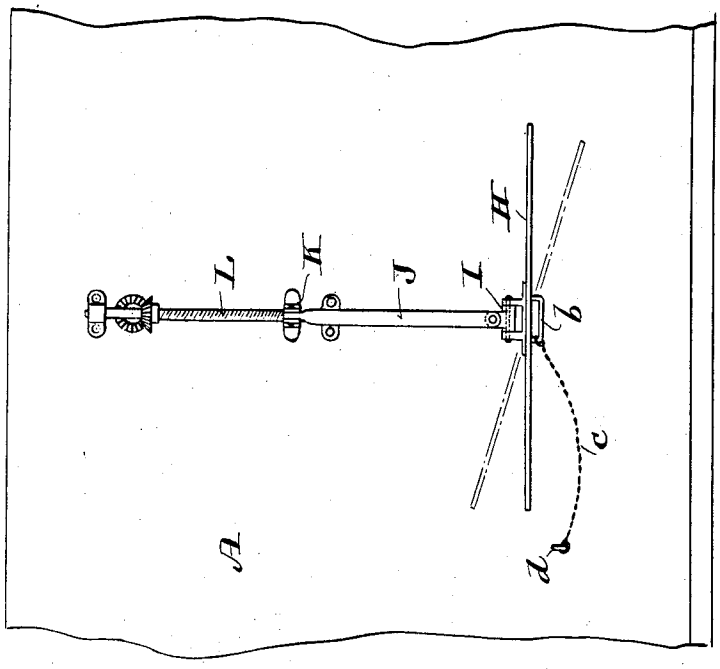
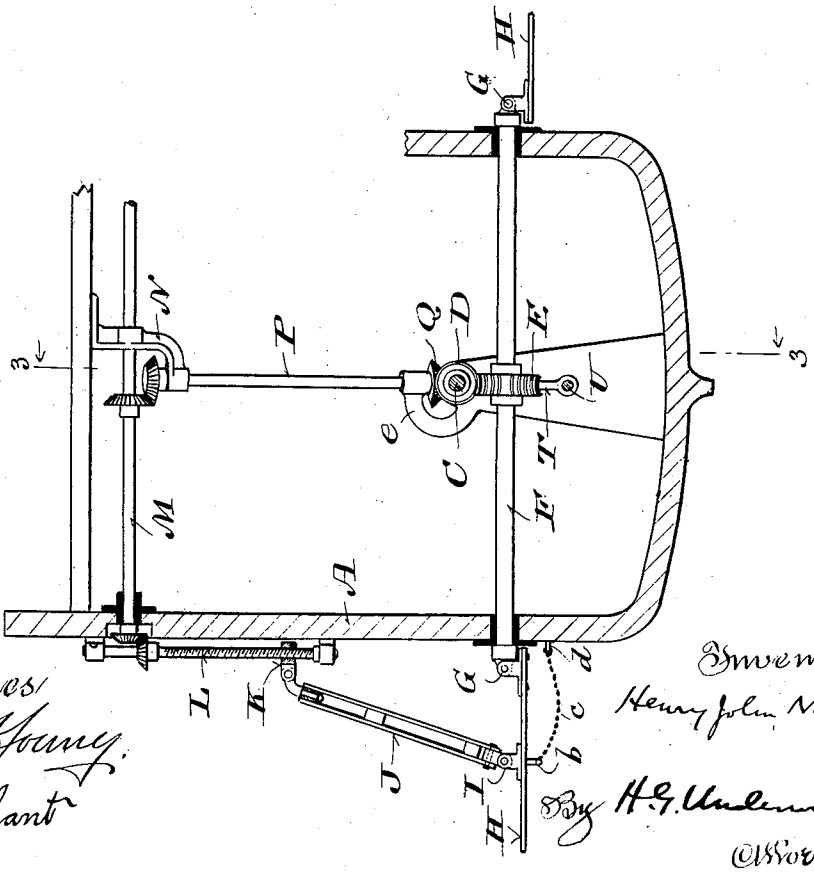


Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

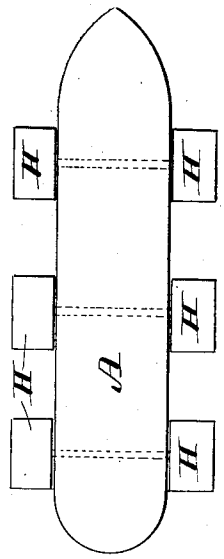
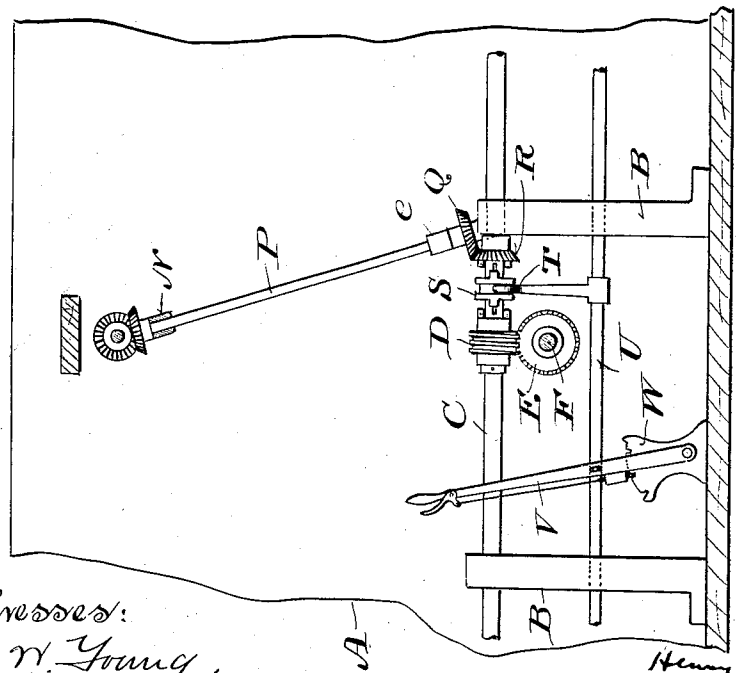


Fig. 3.



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No. 767,827. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

HENRY JOHN NOLL, OF MILWAUKEE, WISCONSIN.

ADJUSTABLE FIN FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 767,827, dated August 16, 1904.

Application filed January 30, 1904. Serial No. 191,260. (No model.)

To all whom it may concern:

Be it known that I, HENRY JOHN NOLL, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Adjustable Fins for Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof.

The main object of my invention is to obtain greater speed of marine vessels with the same expenditure of power ordinarily employed; and it consists, primarily, in providing such a vessel with submerged fore and aft side blades adjustable to incline upward in the direction of movement of said vessel.

It further consists of the same blades adjustable to lie alongside the vessel and in structural details, all as hereinafter particularly set forth with reference to the accompanying drawings, and subsequently claimed.

Figure 1 of the drawings represents a transverse section view of a fragment of a marine vessel provided with adjustable fore and aft side blades in accordance with my invention; Fig. 2, a side elevation of the same; Fig. 3, a sectional view on the line 3 3 in the first figure of the series, and Fig. 4 a diagram of the vessel equipped on both sides with a series of the blades.

Referring by letter to the drawings, A indicates the hull of a marine vessel intended to be propelled by power generated aboard the same. Over the keel of the vessel are standards B, in which a fore-and-aft shaft C has its bearings, suitable means being employed in practice to impart rotary motion to the shaft. Loose on said shaft is a worm D, having a clutch-hub, and this worm is in mesh with a worm-wheel E, fast on another shaft F athwart the vessel. The shaft F extends through the sides of the vessel in stuffing-boxes a suitable distance below the water-line, and by means of hinge-couplings G blades H are connected to the ends of said shaft.

Each of the blades H is preferably provided with an eye *b*, connected by a chain *c* to another eye, *d*, projecting from the side of the vessel, whereby loss of said blade is prevented in case it becomes detached from the shaft F aforesaid. Another hinge-coupling, I, in connection with each blade is pivotally connected to one end of a link J to form a universal joint, and the other end of the link has swivel connection with a nut K on a screw L, for which the adjacent side of the vessel is provided with bearings. The screws L are in bevel-gear connection with the ends of a shaft M athwart the vessel in a hanger N and other suitable bearings below deck. The hanger and an arm *e* of one of the standards B serve as bearings for a shaft P in bevel-gear connection with the shaft M, and a bevel gear-wheel Q, fast on said shaft P, meshes with a similar wheel R, that is loose on the shaft C and clutch-toothed on one of its sides. A clutch S is splined on the shaft C between the clutch end of the hub of the worm D and the clutch-toothed side of gear-wheel R, and a spanner T, embracing the clutch, is rigidly connected to a longitudinally-adjustable rod U, guided in the standards B, this rod being in connection with a hand-lever V, that is operated to throw said clutch. The hand-lever is shown provided with a latch that engages a segment-rack W to hold said lever in adjusted position.

In practice the blades H are swung from alongside the vessel to a horizontal position or the reverse as a result of an engagement of the clutch S with the gear-wheel R and a rotation of the shaft C in the proper direction. The blades being adjusted to horizontal position and the clutch S engaged with the worm D, said blades may be set by proper turning of shaft C to incline upward in the direction of the movement of the vessel, as shown by dotted lines in Fig. 2, the result being a tendency of said vessel to lift and ride with greater buoyance, its speed being proportionately accelerated. It may be desirable at times to adjust the blades, so as to have them act as means for retarding motion of the vessel, and the chains *c* then serve to resist strain on said blades.

The blades in pairs and their adjusting mechanism in connection with shaft C may be multiplied indefinitely in proportion to the length of the vessel, three pairs of blades being shown in the diagram Fig. 4.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A marine vessel provided with a rotary adjustable shaft that extends through its sides below water-line, blades in hinge-joint connection with the ends of the shaft, and means for laying the blades alongside said vessel.

2. A marine vessel provided with a rotary adjustable shaft that extends through its sides below water-line, blades in hinge-joint connection with the ends of the shaft, chains in connection with the blades and vessel, and means for laying said blades alongside said vessel.

3. A marine vessel provided with a rotary adjustable shaft that extends through its sides below water-line, blades in hinge-joint connection with the ends of the shaft, links in universal-joint connection with the blades, screws for which the sides of the vessel are provided with bearings, nuts on the screws in swivel connection with the links, and means for turning said screws.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

HENRY JOHN NOLL.

Witnesses:
N. E. OLIPHANT,
HUGO FAHL.