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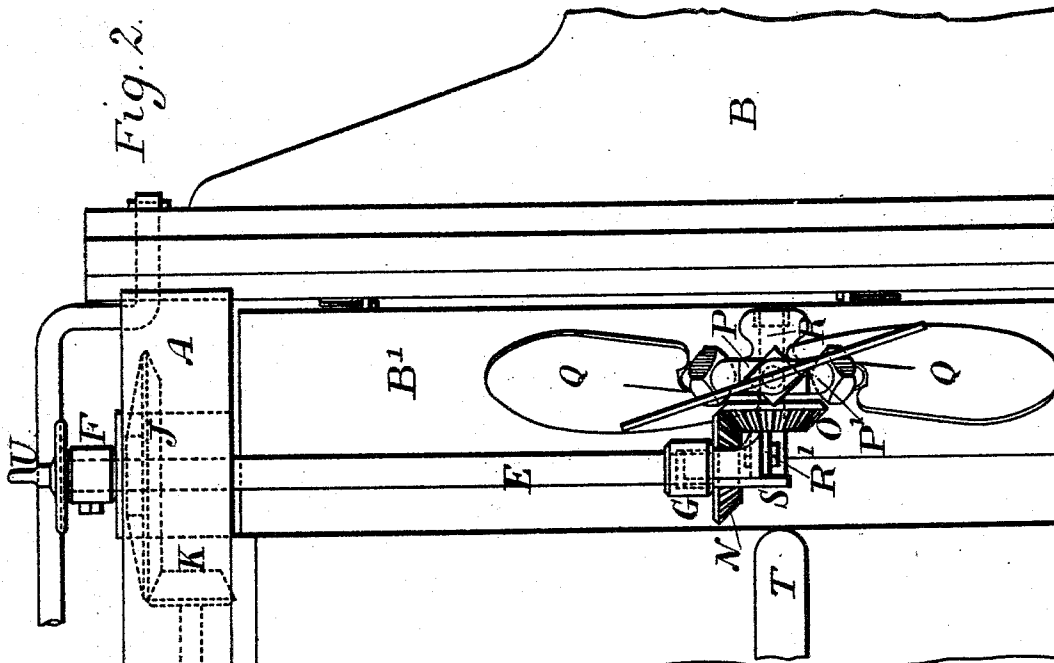
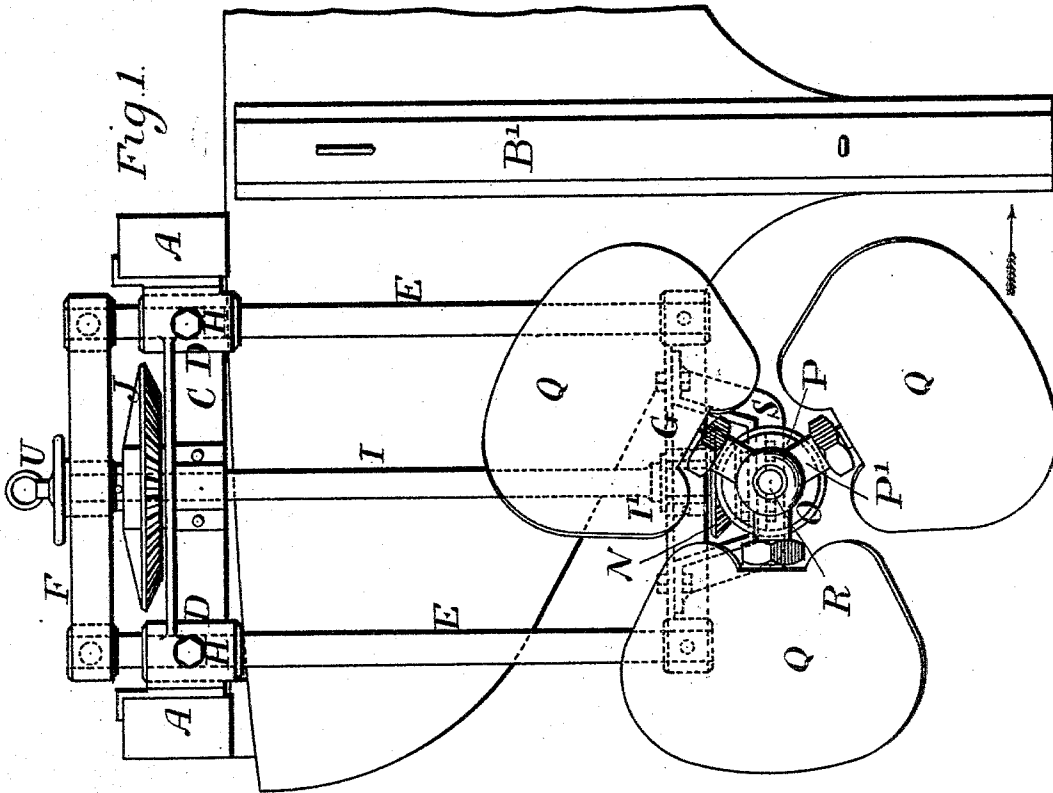
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H. BARCROFT.

APPARATUS FOR PROPELLING BOATS OR VESSELS.

No. 515,642.

Patented Feb. 27, 1894.



Witnesses:
L. H. Rea,
J. A. Saul

Inventor:
Henry Barcroft
By James L. Norris,
Atty

(No Model.)

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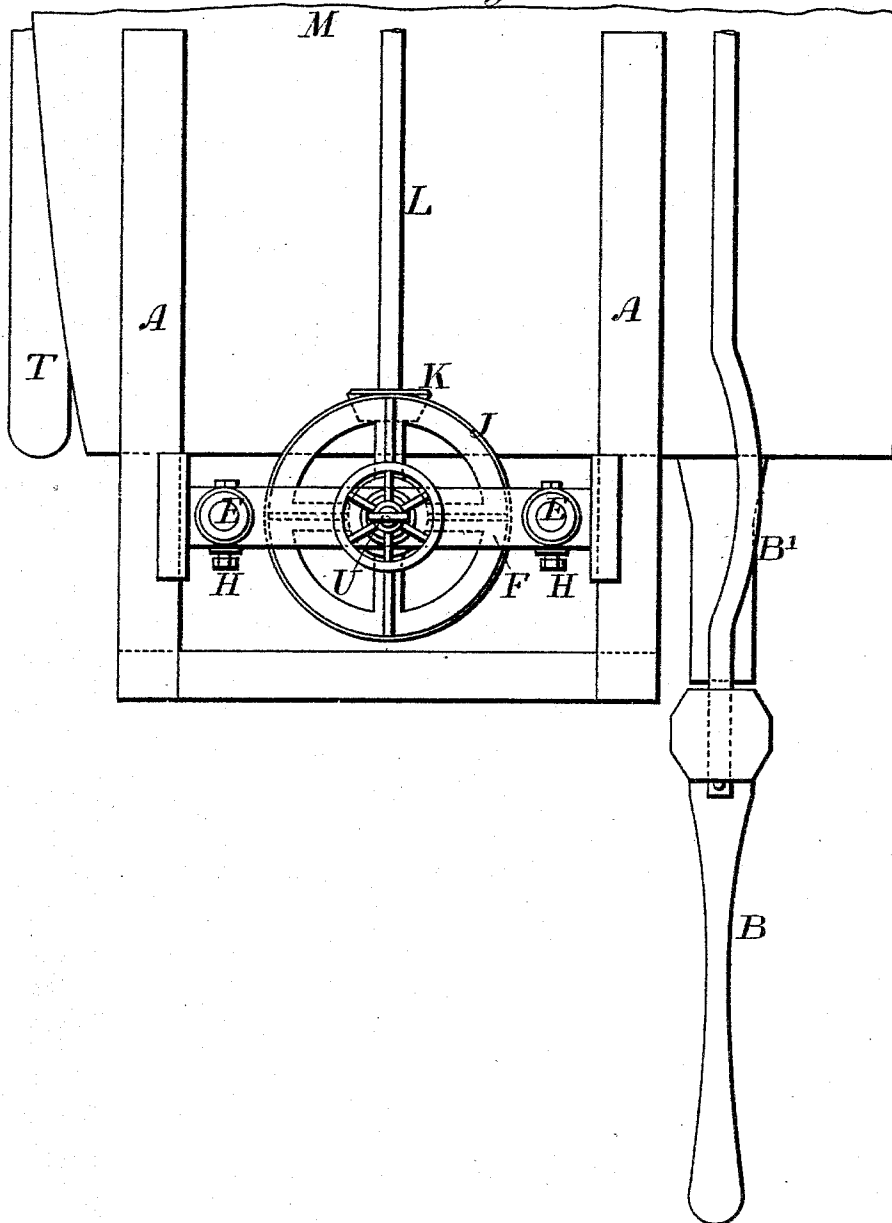
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Fig. 3.



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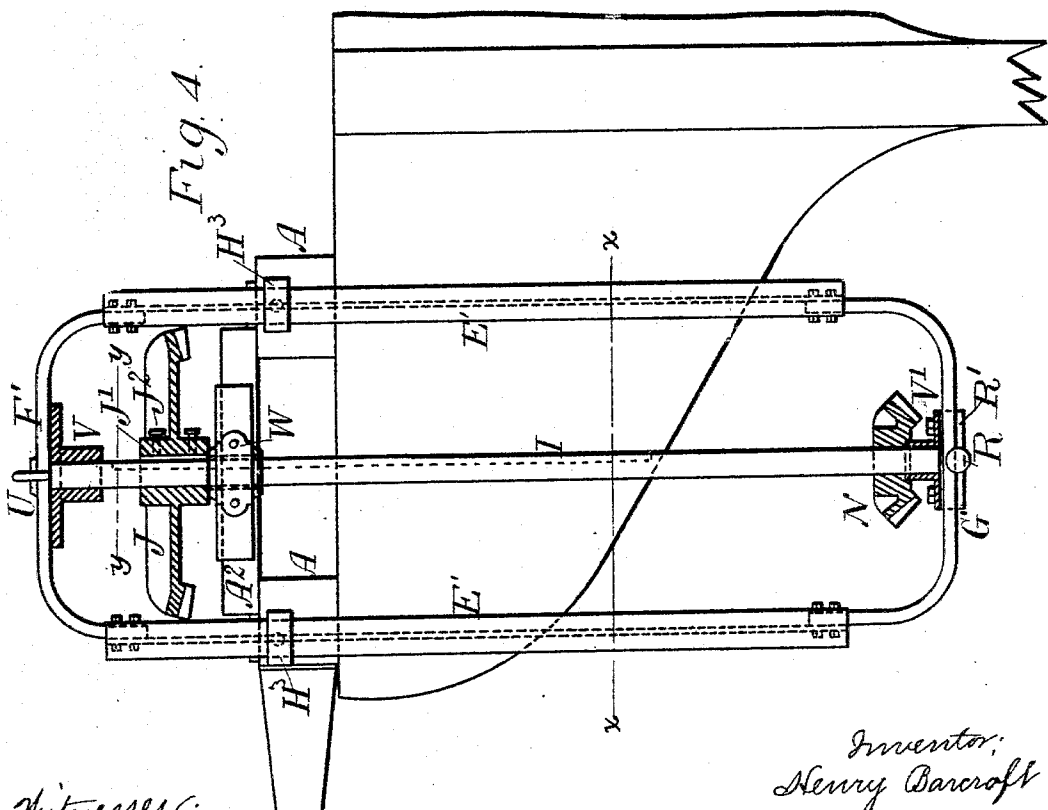
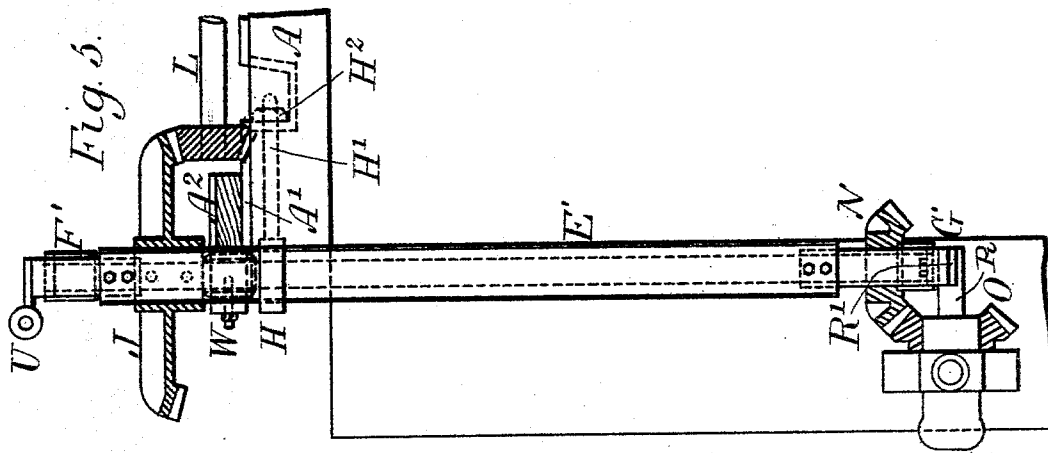
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Witnesses;
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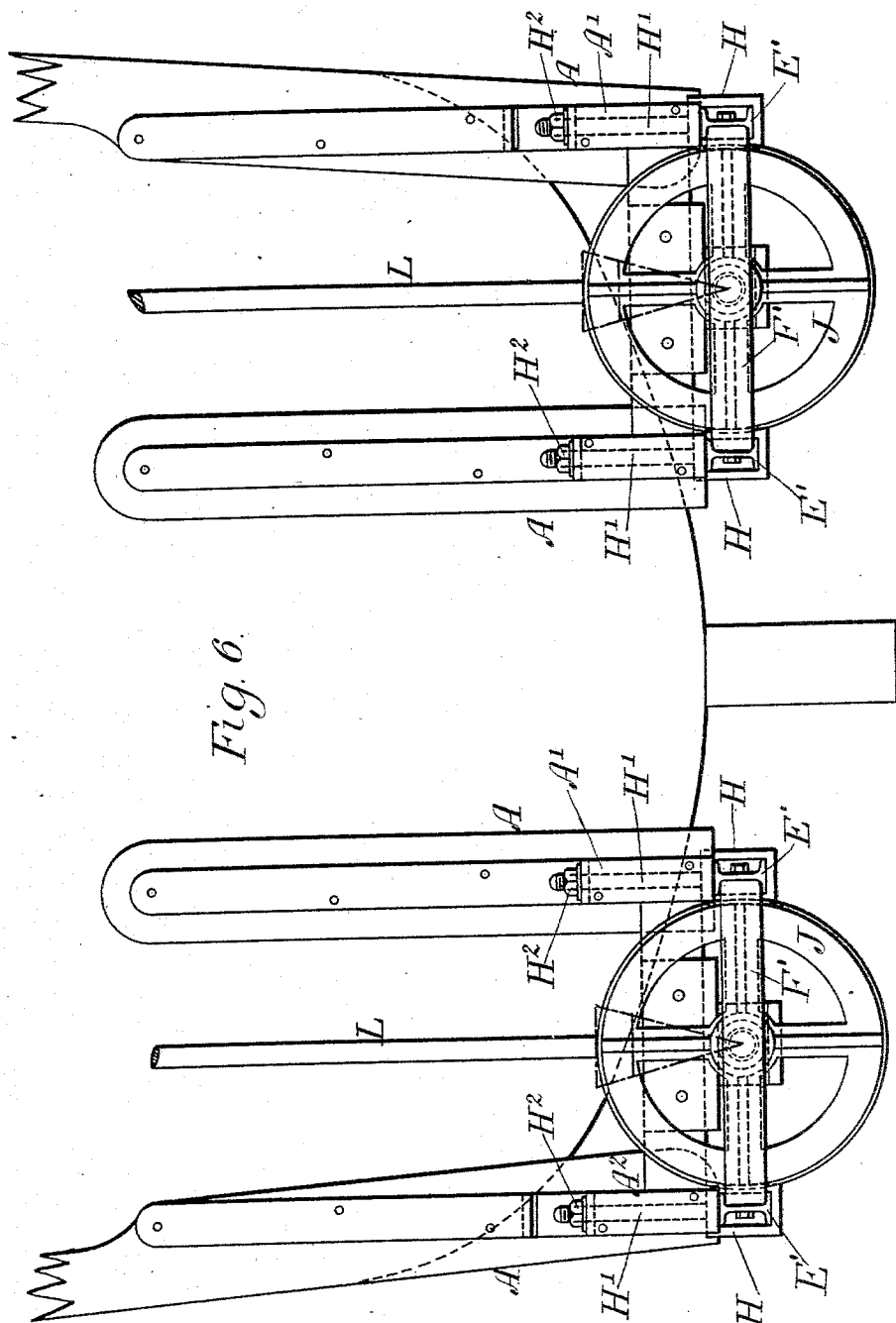


Fig. 6.

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Fig. 7

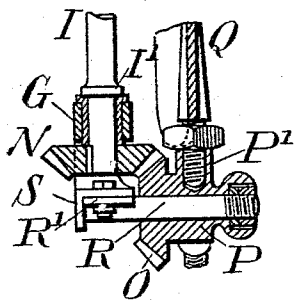


Fig. 8

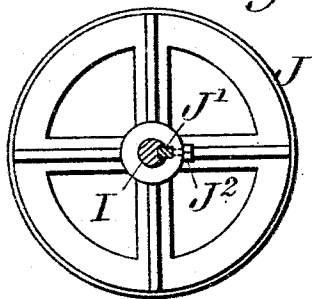
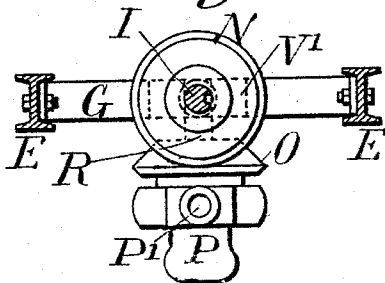


Fig. 9



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

HENRY BARCROFT, OF NEWRY, IRELAND.

APPARATUS FOR PROPELLING BOATS OR VESSELS.

SPECIFICATION forming part of Letters Patent No. 515,642, dated February 27, 1894.

Application filed June 15, 1893. Serial No. 477,740. (No model.) Patented in England September 1, 1892, No. 15,693; in France June 6, 1893, No. 230,660, and in Germany June 9, 1893, No. 73,239.

To all whom it may concern:

Be it known that I, HENRY BARCROFT, a citizen of England, residing at The Glen, Newry, in the county of Armagh, Ireland, have invented certain new and useful Improvements in Apparatus for Propelling Boats or other Navigable Vessels, (for which I have obtained Letters Patent in Great Britain, dated September 1, 1892, No. 15,693; in France, dated June 6, 1893, No. 230,660, and in Germany, dated June 9, 1893, No. 73,239,) of which the following is a specification.

In the specification to my Patent No. 476,122 of May 31, 1892, I described a construction of apparatus for propelling and steering boats and other navigable vessels in which two sets of propeller blades revolving in contrary directions were mounted on a vertically sliding frame carried by horizontal supports overhanging the stern of the boat amidships, the frame with the propellers being raised or lowered to suit the varying water line of the boat, while the horizontal supports were mounted on a turntable so as to cause the propeller axis to assume angular positions for steering the boat.

According to my present improvements I simplify the construction of such apparatus by dispensing with the one set of propeller blades, and arranging the same in such manner that an ordinary rudder can be used for steering so that the mounting of the framing on a turntable for effecting the steering is also dispensed with. The apparatus is by this means rendered very simple and inexpensive, and capable of being readily placed in position and removed, so that it may be applied with great advantage not only to barges, but also to sailing ships as auxiliary propelling power. For this purpose I construct the vertical frame with its vertical shaft and driving gear in a similar manner to that described in my said prior specification, but in place of providing two sets of propeller blades made to revolve in contrary directions, I provide only a single set of blades, and instead of placing the horizontal supports so as to overhang the stern amidships, I, according to one arrangement, place them to such an extent to one side of the stern post that the propeller

blades in revolving will just clear the latter. Furthermore, when necessary I extend the stern post outward to such an extent that an ordinary rudder hinged thereto can be made to assume the extreme angular position required for steering without interfering with the vertical frame and its propeller blades.

The vertical shaft of the propeller blades may be driven in any of the ways described in my said specification, such as by a small portable motor engine and boiler on deck or by an electric or other suitable motor, the whole apparatus being so arranged as to be readily placed in position and removed, so as to be capable of being transferred from one barge to another when required, thus enabling one set of propelling apparatus to serve for two barges, one of which is being loaded or unloaded at the one end station, while the other is performing the journey to and from the other end station.

With the single set of propeller blades, immersed only to near their horizontal axis, there would of course be a tendency to a lateral displacement of the stern of the vessel due to the lateral thrust exercised by the blades. I counteract this however by causing the propeller blades in passing through the water to revolve in the direction away from the stern post, so that the lateral thrust will then tend to turn the stern of the boat in the contrary direction to that in which the boat tends to turn owing to the lateral position of the propeller relatively to the longitudinal center line of the boat.

When applying the apparatus to larger vessels, two sets thereof might be employed, one on each side of the rudder, and one or more others might also be arranged on each side of the vessel if necessary.

On the accompanying drawings are shown two modifications of the above described propeller apparatus.

Figure 1 shows a rear view; Fig. 2, a side view, and Fig. 3 a plan of one arrangement; Fig. 4, a front view partly in section; Fig. 5, a side view partly in section; Fig. 6, a plan of the second arrangement. Fig. 7, is a part vertical section of the lower end portion of the construction shown in Figs. 1 and 2; Fig.

a detail sectional view taken on the line 4-4, Fig. 4; and Fig. 5 a detail sectional view taken on the line 2-2, Fig. 4.

In the arrangement at Figs. 1, 2, and 3, A are beams overhanging the stern of the boat, placed to one side of the rudder B, and supporting a cross bearer C fixed thereto. This bearer is formed with eyes D through which slide the vertical bars E E of a frame E' F' G', which can be adjusted in height relatively to the cross bearer C and is secured in such position by means of eye bolts or setting screws H. The cross bars F' G' of the frame are formed with central collar bearings for the vertical shaft I, on which are fitted first an upper bevel wheel J with which gears a pinion K on the driving shaft L of any suitable motor engine placed either at M or elsewhere on the boat, and secondly a lower bevel wheel N which gears with a bevel wheel O fixed on or formed in one with the boss P of the propeller blades Q. The wheel and boss being preferably arranged to run loose on the axis R which is fixed by lateral wings R' to the bracket S bolted to the bottom cross bar G of the frame as shown in Fig. 1. The shaft I is supported by a collar on the bearing of the lower cross bar G.

The adjustment of the frame E' F' G' so as to bring the propeller into the desired position relatively to the waterline, may be effected by a winch temporarily placed upon the bearers A and from which the frame is suspended by the eyes D.

To allow of the free angling of the rudder at the stern post B' is made to project to the same extent as the propeller. The stems of the propeller blades Q are either screwed into sockets P' on the boss P, as in Fig. 1, or they may be otherwise secured.

As before stated, if the propeller is only partially immersed, it is rotated in the direction in which it will exercise a lateral thrust in the direction of the arrow shown in Fig. 1, so that it will counteract the tendency of the boat to turn in the opposite direction owing to the lateral position of the propeller.

A fender F may be fixed to the side of the boat to protect the propeller and frame from injury.

Figs. 4, 5, 6, 7 and 8 show a modified construction of the framing: Fig. 4 shows a front view partly in section, Fig. 5 a side view partly in section and Fig. 6 a plan showing the application of two frames with their propellers, one on each side of the rudder post. In this construction the vertical bars E' of the frame are of I section, as in Fig. 3 to the upper and lower ends of which bars are bolted curved transverse bars F' and G' fitted with step bearings V, V' for the reception of the ends of the shaft I. The axis R on which is mounted loose the boss of the propeller blades as before described, is fixed by wings R' to the under side of the cross bar F', by means of the same screw bolts that secure the step bearing V'. The frame E' F' G' instead of sliding

through eyes in a cross framing (as described in the first arrangement, is held in position against the ends of the overhanging beams A by means of loops H³ embracing the bars E' and having stems H⁴ passing through holes bored longitudinally in the beam to a recess cut therein, where they receive nuts H⁵ on their threaded ends, the beam being strengthened by a metal strap A' at this part, so that by screwing up the nuts, the bars E' are nipped tight between the eyes H³ and the ends of the beams. The shaft I is supported by a neck bearing V fixed upon a wood cross bearer A' fixed to the beams A. The bevel wheel J slides with a loose key J' as in Fig. 3 upon the grooved shaft, and when the frame E' and shaft have been adjusted in height, the wheel J is securely fixed thereto by means of setting screws J' bearing against the loose key J'. It will be seen that with this construction the frame E' F' G' with its shaft I, wheel J and propeller can be readily detached from the beams A by simply unscrewing the nuts H⁵ and withdrawing the stems of the loops H³ and then fitting the frame to another barge having identical bearers to receive it; and where a number of vessels are to be propelled by such an apparatus, these would all be made identical and interchangeable, so that any apparatus can be fitted to any vessel. The motor engines with their driving shaft L and accessories would in like manner be made identical and interchangeable.

When two sets of semi submerged propellers are employed, as at Fig. 5, they would be arranged to be driven in opposite directions. Each propeller being arranged to work as previously described so that its lateral thrust counteracts the tendency to turn the boat owing to the one-sided position of the propeller. It will be seen that for running the boat at a slow speed or for stopping the one propeller can be worked at full speed while the other is entirely stopped or reversed without producing any tendency to turn the vessel, such as occurs with ordinary wholly submerged propellers. The propeller blades are advantageously made of considerably greater area than usual, as shown at Figs. 1 and 2. When the vessels are designed to run in confined water ways.

Having thus described the nature of this invention and the best means I know for carrying the same into practical effect, I claim—

1. An apparatus for propelling boats and other navigable vessels by means of propellers carried by a frame overhanging the stern of the boat, the combination of horizontal bearers A A overhanging the stern of the boat on one side of the rudder, a frame adjustably secured to the bearers A by clamping devices, a grooved shaft I carried in bearings at the upper and lower ends of said frame, bevel gear J N on the said shaft, an axis R projecting on the outer side of the lower part of said frame, and a single set of propeller blades Q carried by a boss running loose on the axis

R and having a bevel wheel O gearing with the bevel wheel N on the shaft I substantially as described.

2. In apparatus for propelling boats and
5 other navigable vessels by means of propellers carried by a frame overhanging the stern of the boat, the combination of horizontal bearers A A overhanging the stern of the boat
10 a frame adjustably secured to the bearers by loop or eye bolts passing longitudinally through the beams A and adapted to nip the said frame against the ends of the bearers, so
15 as to secure the same in an easily removable manner, a grooved shaft I carried in bearings at the upper and lower ends of the said frame, bevel gear J N on the said shaft, an

axis R projecting on the outer side of the lower part of said frame, and a single set of propeller blades Q carried by a boss running loose on the axis R and having a bevel wheel 20 O gearing with the bevel wheel N on the shaft I substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of 25 May, A. D. 1893.

HENRY BARCROFT.

Witnesses:

JOSEPH FISHER,
Ship Broker, Newry.

HUNTER MOORE,
Public Notary, Newry.