

(No Model.)

2 Sheets—Sheet 2.

H. BARCROFT.
APPARATUS FOR PROPELLING VESSELS.

No. 476,122.

Patented May 31, 1892.

Fig. 4.

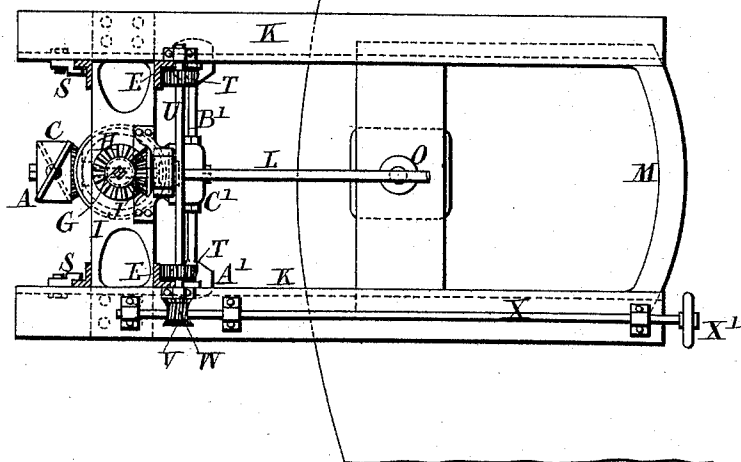
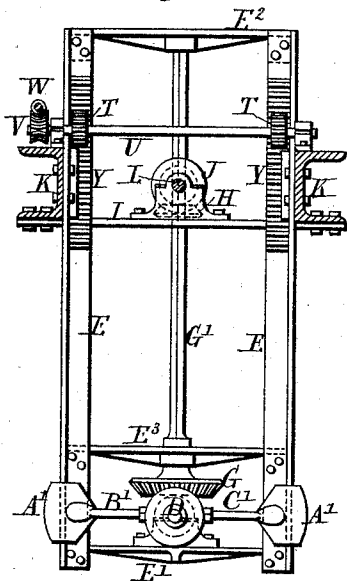


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY BARCROFT, OF NEWRY, IRELAND.

APPARATUS FOR PROPELLING VESSELS.

SPECIFICATION forming part of Letters Patent No. 476,122, dated May 31, 1892.

Application filed October 21, 1891. Serial No. 409,388. (No model.) Patented in England April 20, 1891, No. 6,809; in France September 25, 1891, No. 216,351, and in Belgium October 14, 1891, No. 96,791.

To all whom it may concern:

Be it known that I, HENRY BARCROFT, a subject of the Queen of Great Britain, residing at The Glen, Newry, in the county of Armagh, Ireland, have invented new and useful Apparatus for Propelling and Steering Boats and other Navigable Vessels, (for which I have obtained patents in Great Britain, dated April 20, 1891, No. 6,809; in France, dated September 25, 1891, No. 216,351, and in Belgium, dated October 14, 1891, No. 96,791,) of which the following is a specification.

My present invention relates to an improved arrangement of the two oppositely-revolving sets of propeller-blades carried by a platform overhanging the stern of the vessel, described in the specifications to my previous patents, No. 431,428, dated July 1, 1890, and No. 441,049, dated November 18, 1890, whereby the axis on which the propeller-blades revolve is made adjustable vertically, so as to be brought close to the surface of the water, and thus the comparatively great length of the propeller-arms and the necessity for making them telescopic, as described in the said specifications, is obviated, and as a consequence the apparatus is rendered more compact, which is of importance in canals and other narrow water-ways. For this purpose the two sets of propeller-blades are mounted in a vertically-sliding frame carried by a platform that overhangs the stern of the boat, so that by raising or lowering the frame the vertical position of the propeller-blades can be adjusted accurately to the draft of the vessel, so as to insure their proper immersion. At the same time the platform carrying the frame is by preference mounted on a pivot on the deck or other support on the vessel, so that on turning it, together with the frame and propeller-blades, into a more or less angular position relatively to the center line of the vessel the propellers in acting at such angle will effect the steering of the vessel.

I will proceed to describe the construction of the said apparatus with reference to the accompanying drawings, in which—

Figure 1 shows a longitudinal section of one arrangement applicable more particularly to barges or canal-boats. Fig. 2 shows

a part sectional plan, and Fig. 3 shows an end view. Figs. 4 and 5 show plan and elevation of a modified construction.

A and A' are two sets of propeller-blades, the arms B B' of which are mounted in bosses C C', revolving loosely upon the overhanging ends of an axis D, which is fixed upon the bottom transverse piece E' of the vertical frame E, supported by the overhanging bearers K. The bosses C C' have bevel-toothed rings or wheels F F', which may either be formed thereon or by preference fixed thereto by screw-bolts, as shown, with which wheels gears a bevel-wheel G, fixed on a vertical shaft G', carried by the frame E. This shaft is of square or polygonal or round and grooved section and passes through a bevel-wheel H, which is supported by a bracket I, embracing a neck thereon, the shaft being free to slide through the wheel, but is carried round thereby on the wheel, being rotated by means of the bevel-wheel J on the shaft L, carried by the platform M, on which is mounted a suitable motor-engine N for driving the shaft L. Thus on rotary motion being imparted to the vertical shaft G' the bevel-wheel G will effect the rotation in contrary directions of the bosses C C' and propeller-blades A A', which, being suitably inclined, will effect the propulsion of the boat either forward or astern, according to the direction in which they are rotated.

By preference I construct the shaft D as an ordinary carriage-axle and the bosses C C' of the propeller-blades as ordinary wheel-naves, constructed with inclosed spaces for lubricant in the well-known manner, by which arrangement the lubricant will be prevented from becoming washed away by the water and the bosses be kept well lubricated for a length of time. If necessary, a bearing might be provided to the outer ends of the shaft D, supported by transverse bearers from the frame E. The platform is mounted on a pivot O, on which it can be turned either by a hand-tiller P or by suitable steering-gear, so as to cause the frame E and propeller-blades to assume any angular position relatively to the center line of the vessel, and thus to effect the steering thereof.

The inboard end of the platform M is supported by a rail Z, fixed firmly to the deck, the end of the platform being formed with a groove, which embraces the head of the rail, as shown. This rail would be fixed in position after placing the platform and would be easily removable when the platform requires to be removed.

The frame E is in this construction shown formed of two strong wooden beams framed together at top and bottom by cast-iron transverse pieces E' E². The lower one carries the propeller-axis, as described, and also supports by means of the bearer E³ the lower end of the vertical shaft G, the upper end of which runs in a bearing in the transverse piece E².

The frame E is held adjustably between the bearers K by being clamped tightly against a strong transverse metal plate Q, fixed to the bearers by means of clamping-plates Q' and bolts Q², so that on loosening the bolts the vertical frame E is free to be slid up or down between the bearers for adjusting the position of the propeller-blades relatively to the water-level. The adjustment of the frame to the exact position required for the propellers can be conveniently effected by temporarily placing a winch upon the bearers K K and on suspending the frame by its eye E⁴ from a rope or chain or screw raising or lowering the frame until the propellers are in the requisite position relatively to the water-level, whereupon the frame is clamped tightly, as above described. Any other convenient arrangement may be employed for effecting the raising and lowering of the frame. For conveniently effecting the clamping and loosening of the frame a hinged platform R may be provided at the end of the bearers K, which is let down into the dotted position for the operator to stand upon and which is at other times secured in the raised position by suitable catches.

As the bevel-wheel H is always held in the same position by the bracket I, no matter what the position of the frame E with the propeller-blades may be, it will be seen that the latter will always be correctly driven by the motor-engine N. The bearers K might be fixed on the deck instead of being mounted on a turn-table, as described. In that case the steering of the vessel would be effected by an ordinary rudder or large oar in the case of a barge; also, instead of driving the propellers by an engine mounted on the turn-table, this may be effected by an engine situated at any other part of the vessel and connected by suitable transmission shafting and gearing to the shaft L.

When used for canal navigation, the propellers may be conveniently driven by an electromotor receiving its current from a conductor extending along the bank of the canal by means of a sliding contact hauled along by the barge. Such electromotor may either be fixed on the platform M or it may be

mounted on the upper end of the sliding frame and the shaft of the rotating armature be suitably connected through speed-reducing gear to the propeller-shaft G'. This arrangement might also be employed when using rotary or other engines worked by steam or other fluid pressure.

Figs. 4 and 5 show, respectively, a plan and front elevation of a modified construction of the frame E E and raising and lowering gear. In this arrangement the frame E E and the bearers K are made of metal. The general construction is otherwise similar to the first-described arrangement, the parts being indicated by the same letters of reference. The frame slides between angle-iron guides S S, fixed on the bearers K, and the raising and lowering are effected by pinions T T on a shaft U, carrying a worm-wheel V, gearing with a worm W on a shaft X, carried by the bearer and rotated by a hand-wheel X', the pinions T being in gear with racks Y, fixed on the frame E. This may also be held in the position to which it is adjusted by suitable catches.

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

1. In an apparatus for propelling boats, the combination of two oppositely-revolving sets of propeller-blades having their horizontal axes of rotation situated at any desired level and carried by a free hanging vertically-sliding frame, a horizontal support overhanging the stern of the boat and adapted to support the vertical hanging frame in variously-adjusted positions, a vertical shaft carried by the vertically-hanging frame and having at its lower end a bevel-wheel gearing with diametrically-opposite bevel-wheels attached to the bosses of the two sets of propeller-blades, so as to rotate these in contrary directions on their fixed axes, and a bevel-wheel carried by the horizontal support, through the boss of which bevel-wheel passes the vertical shaft connected thereto by tongue and groove or equivalent device so that the bevel-wheel will impart its rotation to the shaft while this is free to slide through the wheel, this being suitably geared to a motor-engine, substantially as described.

2. In an apparatus for propelling boats, the combination of two sets of propeller-blades A, adjustably carried in bosses C, mounted loosely on an axis D, fixed on the lower end of a vertical frame E, adjustable in overhanging supports K, said bosses having bevel-wheels F, geared to opposite sides of a bevel-wheel G on a vertical shaft G', carried by the frame E and connected by gearing H J to the shaft I of a motor-engine mounted on a revoluble platform carrying the supports K of the vertical frame, substantially as described.

3. In an apparatus for propelling boats, the combination of two sets of propeller-blades A, adjustably carried in bosses C, formed as the naves or hubs of ordinary road-wheels and running on a fixed axis D, formed as an or-

dinary carriage-axle and carried by a vertically-sliding frame, the said bosses having bevel-wheels fixed or formed thereon, by which they receive rotary motion in contrary directions from a bevel-wheel on a vertical shaft carried by the said vertically-sliding frame and receiving rotary motion from a suitable motor.

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In testimony whereof I have signed my

name to this specification, in the presence of two subscribing witnesses, this 7th day of October, A. D. 1891.

HENRY BARCROFT.

Witnesses:

JOSEPH McREDMOND,
Newry, County Down, Solicitor's Clerk.

W. McCANN,
Newry, County Down.