(No Model.)

J. L. F. BARBIER.

PROPELLING RUDDER.

No. 299,612. Patented June 3, 1884.

Fig. 1

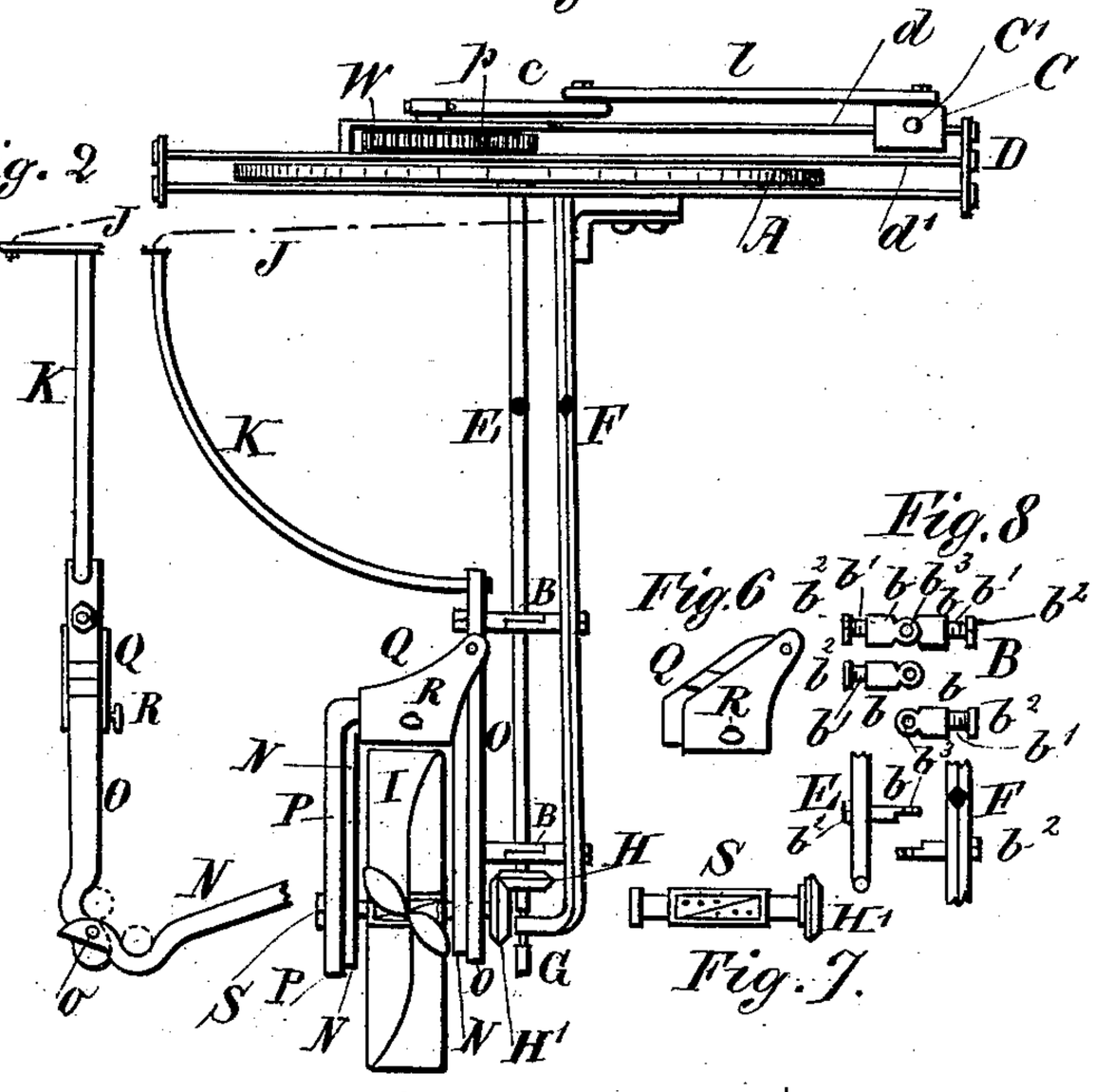


Fig. 2

Fig. 3

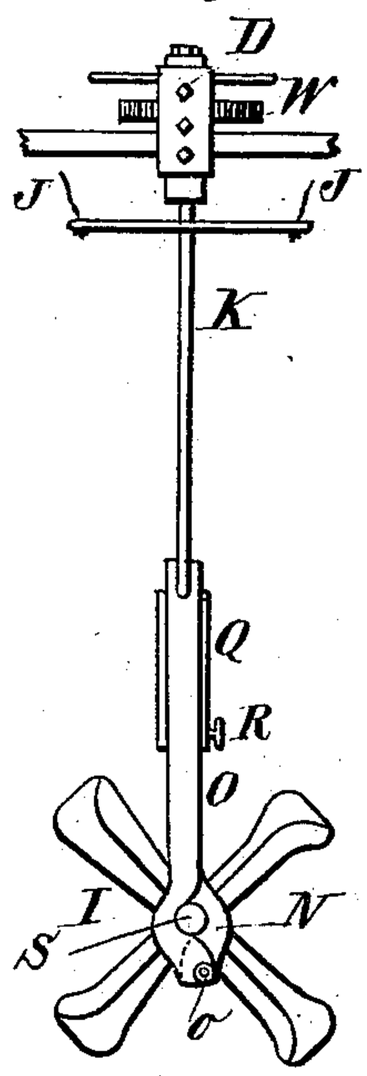
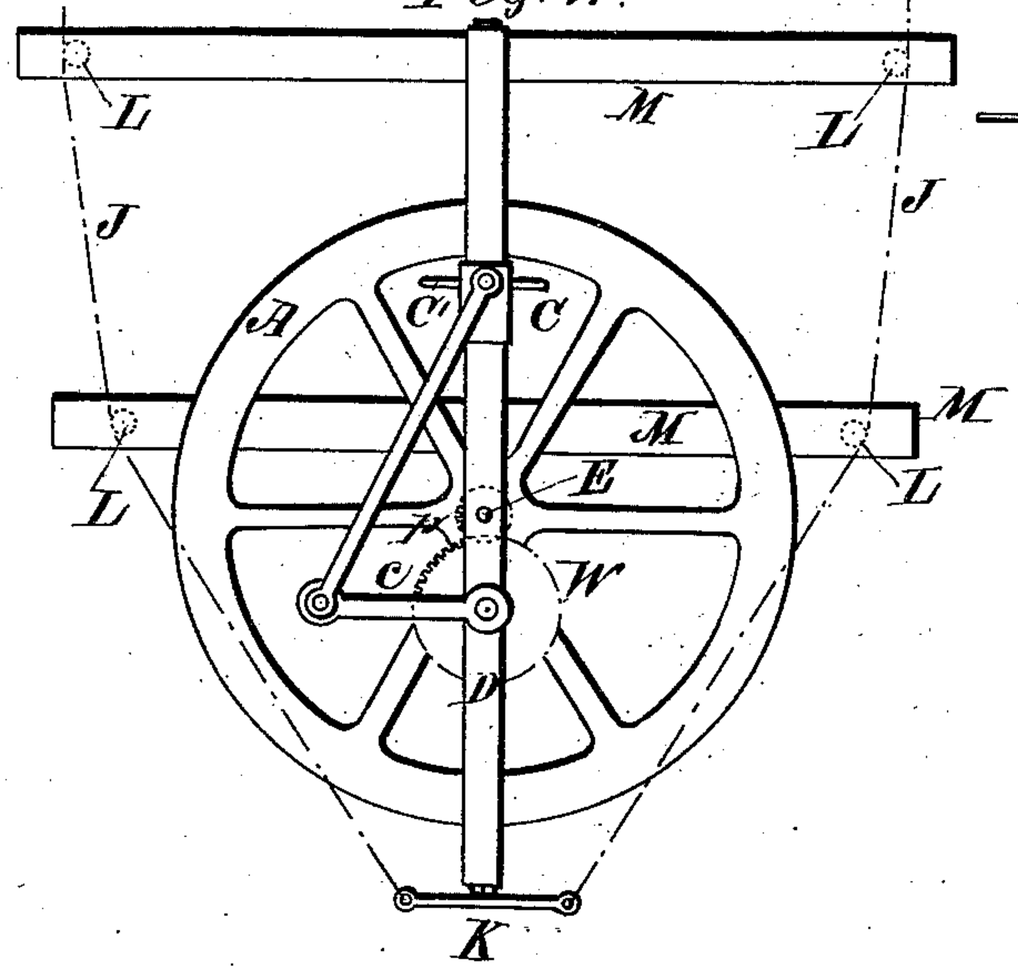


Fig. 6

Fig. 8

Fig. 7.

Fig. 4.



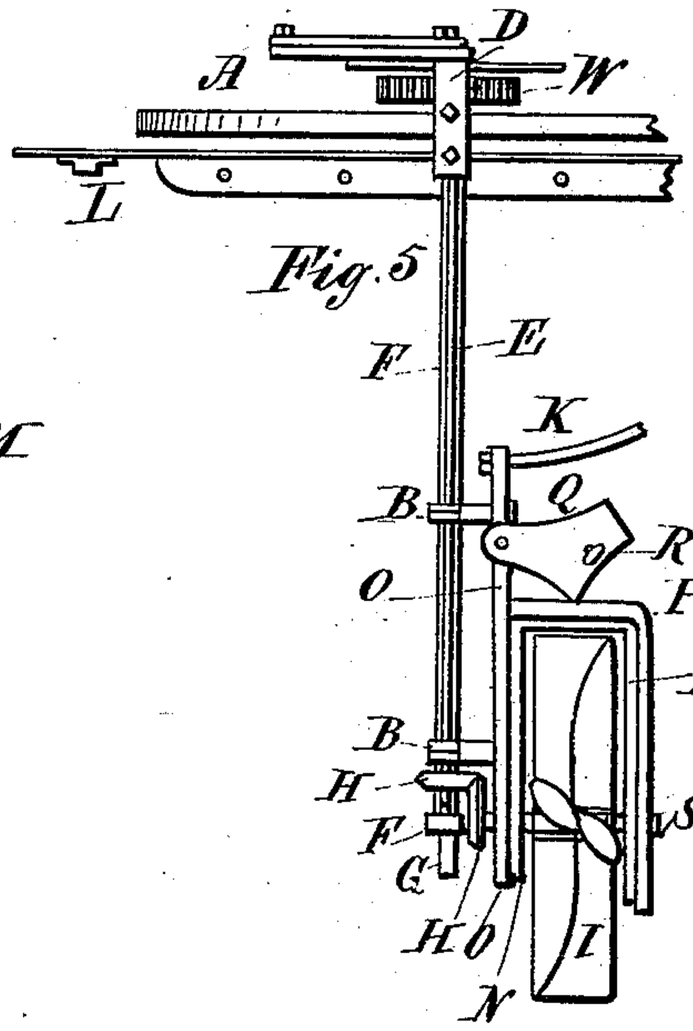


Fig. 5

Witnesses
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UNITED STATES PATENT OFFICE.

JEAN LOUIS FREDERIC BARBIER, OF HAVRE, FRANCE.

PROPELLING-RUDDER.

SPECIFICATION forming part of Letters Patent No. 299,612, dated June 3, 1884.

Application filed January 3, 1883. (No model.) Patented in France August 8, 1882, No. 150,476; in Belgium December 18, 1882, No. 59,861; in Germany December 18, 1882, No. 52,262, and in England December 18, 1882, No. 5,994.

To all whom it may concern:

Be it known that I, JEAN LOUIS FREDERIC BARBIER, of Havre, France, have invented a certain new and useful Improvement in Propelling-Rudders with a Movable Screw, L. Barbier's System; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of this invention is to combine in one apparatus means for propelling and steering vessels, whereby the evolutions from starboard to larboard, and vice versa, may be effected more rapidly and more readily than with an ordinary rudder, and whereby such evolutions may be effected when the vessel is otherwise practically stationary—that is to say, whereby a vessel may be turned upon its own axis.

The further object of the invention is to so construct the apparatus as to adapt it for operation by hand or by any other suitable motive power—such as steam, for example—and also to adapt it for use as an appliance or attachment for vessels or boats, or as a means for propelling and steering safety appliances, such as rafts or other like means resorted to in case of shipwreck.

The invention has for its further object to provide means whereby the propeller or screw may be readily unshipped, and a panel substituted for use as an ordinary rudder.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 is a front elevation of the rudder post or shaft and tiller, that serves as a bearing for the propeller. Fig. 3 is a rear view of said shaft and bar, showing the propeller mounted in its bearing. Fig. 4 is a top plan view of the operating devices of the apparatus. Fig. 5 is a rear view showing the steering and propelling apparatus shifted to starboard. Fig. 6 is an isometric view of the pivoted brace or cap for bracing the propeller-bearings. Fig 7 is a plan view of the propeller-shaft. Fig. 8 shows the coupling-braces in plan and elevation.

Like letters indicate like parts in the above figures of drawings.

F indicates a false stern-post, to the upper end of which is secured a frame, D, that serves as a support and bearings for the driving mechanism of the propeller or screw I. A vertical shaft, E, the upper end of which has its bearings in the frame D, is securely braced to the false stern-post F, by means of two-part braces, B, constructed as shown in Fig. 8, in which *b* indicates the body of the brace; *b'*, a neck or throat that is screw-threaded for the reception of a nut, b^2. The body of the brace is reduced in thickness and provided at that point with a cylindrical aperture, b^3, through which the vertical shaft E passes, and in which it is free to rotate. When the two parts of the brace are secured to the rudder post or shaft and the false stern-post F, and the shaft E passed through the apertures b^3, said braces overlap each other and form hinge-joints, so that the shaft E is not only free to rotate in said braces, but also performs the function of a pintle for said hinge-joints upon which the propeller-rudder may be oscillated or swung to steer the vessel and propel it. Upon its upper end the shaft E carries a fly-wheel, A, that rotates in the frame D, and above said fly-wheel said shaft carries a pinion, *p*, that meshes with a gear-wheel, W, supported and adapted to rotate in bearings formed in the bars *d d'* of the frame D, as shown in Fig. 1. The gear-wheel W carries a crank, *c*, connected by a rod or link, *l*, with a block, C, that is mounted and capable of sliding on the arm *d* of the frame D. It is evident that when the block or slide C is reciprocated upon the arm *d*, a rotary motion will be imparted to the crank *c*, and wheel W through the link *l*, and by the wheel W to the pinion *p* and shaft E. The reciprocation of the slide may be effected in any suitable manner, either by hand or by connection with the piston-rod of an engine.

When the apparatus is constructed for operation by hand in its application to small boats or life-saving appliances, the slide C is provided with laterally-projecting handles C', Figs. 1 and 3. In this manner the slide may be reciprocated and the shaft E rotated, with

considerable ease and comparatively little fatigue, by one man, the fly-wheel assisting materially in overcoming the power required to rotate the shaft.

The false stern-post F at its lower end is bent at right angles and provided with a screw-threaded aperture for the reception of a steel set-screw, G, terminating in a conical point, upon which the lower end of the vertical shaft E is stepped, as shown in Figs. 1 and 4. The shaft carries near its lower end a bevel-pinion, H, that meshes with a like pinion, H′, carried by the propeller-shaft S, Figs. 1, 4, and 7, by means of which gearing and the operating mechanism above described the shaft E and the propeller I are rotated. The propeller-shaft S has its bearings in a housing that constitutes the rudder. This housing is of peculiar construction, so as to adapt it to open and close laterally, to open or close the propeller-shaft bearings and admit of the ready removal or unshipping of the latter and the substituting of a new one in case of breakage, or when it is desired not to use the propeller, in which case a solid panel may be substituted and used as an ordinary rudder. This framing or housing is constructed as follows:

O is the rudder post or shaft, braced to the false stern-post F, as hereinbefore described, to which is attached a rectangular bar, P, projecting therefrom. N is a like rectangular bar or frame hinged to the rudder post and bar, as shown at *o*, Fig. 2, in such manner that the part N will fold or close into the part O P, as shown in Figs. 1 and 4. At the point where the rectangular frames N and O P are hinged together bearings are formed for the propeller-shaft S. These frames constitute the propeller-housing, and with the propeller they also constitute the rudder, as it is evident that the propeller will oscillate to right or left—that is to say, from starboard to larboard, or vice versa—when the rudder post or shaft O P is oscillated through the medium of the tiller K. The tiller or rudder-bar is preferably curved, as shown, and carries at its upper end the usual cross-head or handle, *k*, to which the operating ropes or chains J are connected, said chains passing over pulleys L, supported from angle-irons M; and said ropes or chains, in the case of a vessel, may be connected to the steering-wheel; or they may be operated by hand on a small boat or life-saving appliance; or said tiller may be operated without such ropes or chains by means of the tiller-bar. The two parts N and O P that form the housing for and support the propeller I, and constitute at the same time the rudder, are firmly held in position by means of a brace cap or clamp, Q, pivoted to the rudder post or shaft O, and a bolt and winged nut, R. The brace-clamp is shown in its normal position in Fig. 1, tilted above the frames in Fig. 4, and by a detached isometric view in Fig. 6.

In practice I construct the rudder-shaft in such manner as to adapt it for direct connection with a driving-shaft of an engine. This may be effected in various ways—as, for instance, by extending the propeller-shaft beyond the pinion H′ and providing the same with a suitable clutch or other coupling for connecting the same with such driving-shaft; or such connection may be made by any other of the well-known means for coupling shafts.

Instead of the adjustable conical screw-step G, the shaft E may be stepped in any other desired or preferred manner upon the false stern-post F. I prefer the means shown, for the reason that the friction of the shaft in its bearings is reduced to a minimum; secondly, because the extent of engagement of the teeth of the pinions H H′ with one another may be nicely adjusted and the wear of such teeth readily compensated, and back-lash thereby avoided.

I have above described, as an example, a suitable mechanism for rotating the shaft E. Any other appropriate mechanism may, however, be substituted therefor—as, for example, a belt-pulley or shaft, E, may be directly connected with any suitable driving-pulley; or the crank or eccentric may be mounted on shaft E and connected either directly or by means of connecting-rods with a reciprocating motor; or a multiplying gear may be employed and driven from a suitable prime motor.

The operating devices of the shaft E will necessarily depend upon the circumstances under which the apparatus is employed. I do, therefore, not desire to limit myself to any special driving mechanism for such shaft.

Having thus described my invention, what I claim is—

1. The combination, with the rudder-post O P, the frame N, connected therewith, as described, the propeller-shaft and propeller, a driving-shaft to rotate said propeller, a false stern-post from which the shaft and rudder-posts are supported, of hinge-joints for flexibly connecting the rudder-post with the false stern-post and of which said driving-shaft forms the pintle, substantially as and for the purposes specified.

2. The combination, in a steering-propeller, of a false stern-post, a driving-shaft for the propeller, and a rudder-post from which the rudder and propeller are supported, both the driving-shaft and rudder-post being supported from the false stern-post, of hinge-joints for flexibly connecting the rudder-post with the false stern-post, of which the driving-shaft forms the pintle, substantially as and for the purposes specified.

3. The combination, with the false stern-post, the rudder-post O P, the frame N, and braces B, of the shaft E, arranged to form the pintle for the braces, whereby both the rudder-post and parts connected therewith are hinged to and supported from the false stern-post, substantially as described, for the purpose specified.

4. The combination, with the propeller-shaft S, carrying pinion H′ and the propeller, the rudder-post O P and frame N, forming a housing and support for said propeller-shaft and propeller and constituting the rudder, the shaft E and pinion H for rotating the propeller, of the false stern-post F, the frame D, from which shaft E is supported, and the braces B, by means of which the rudder-post is hinged to the false stern-post through the medium of said shaft E, substantially as described, for the purpose specified.

5. The combination, with the false stern-post and the propeller-shaft, of the rudder composed of the rudder-post O P and the frame N, hinged together at *o* and secured to the false stern-post, as described, and the clamp Q, and retaining bolt and nut R, all arranged for co-operation, substantially as described, for the purposes specified.

6. The combination of the frame D, the false stern-post F, the braces B, the pivoted rudder-post O P, the frame N, and tiller K, the shaft E, having its bearings in post F and frame D, the pinion H, the propeller-shaft S, pinion H′, and suitable mechanism for rotating shaft E, all constructed and arranged for operation as described.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of December, 1882.

L. BARBIER.

Witnesses:
WILLIAM PARTRIDGE,
T. OCHL.