(Model.)

2 Sheets—Sheet 1.

A. CONRAD.

SCREW PROPELLER.

No. 386,966. Patented July 31, 1888.

Fig. 1.

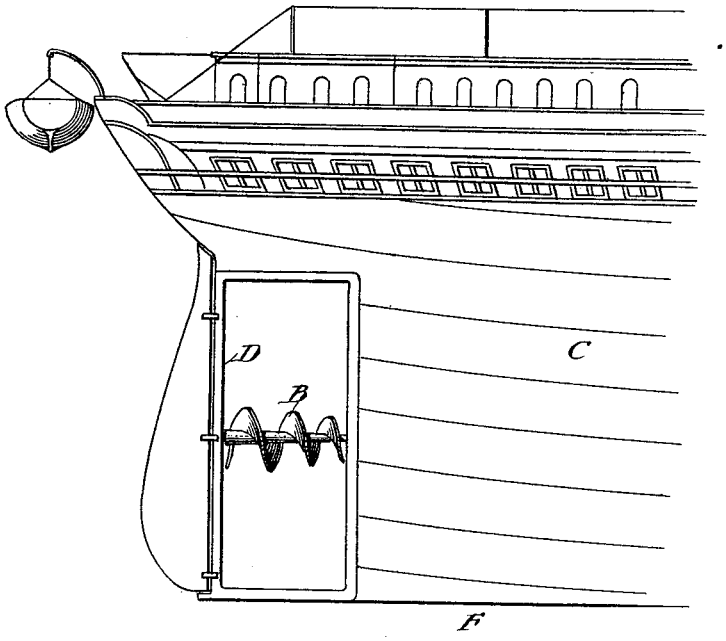
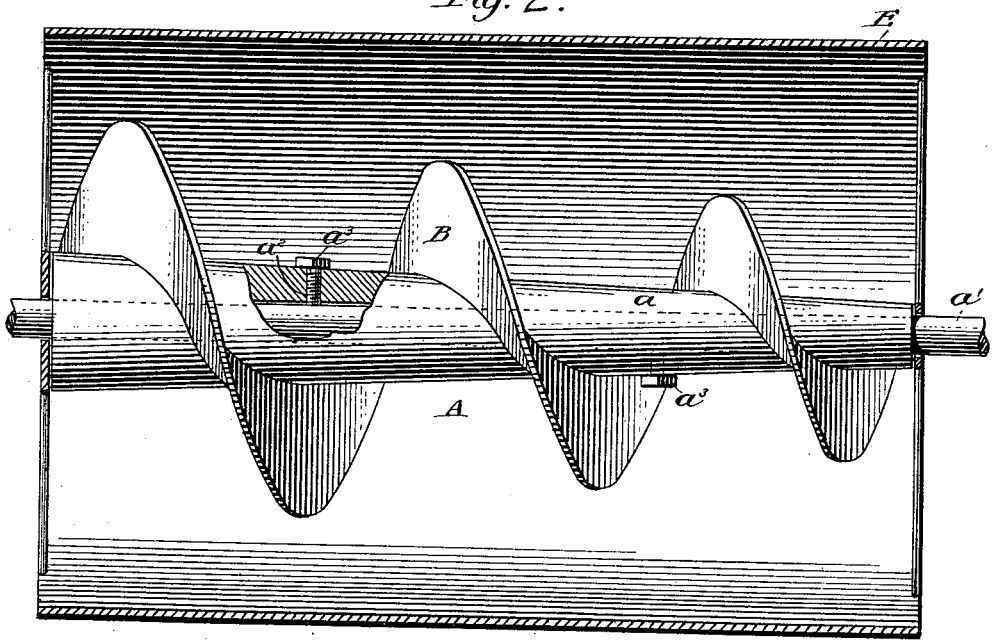


Fig. 2.



WITNESSES:

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C. Sedgwick

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(Model.) 2 Sheets—Sheet 2.

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SCREW PROPELLER.

No. 386,966. Patented July 31, 1888.

Fig. 3.

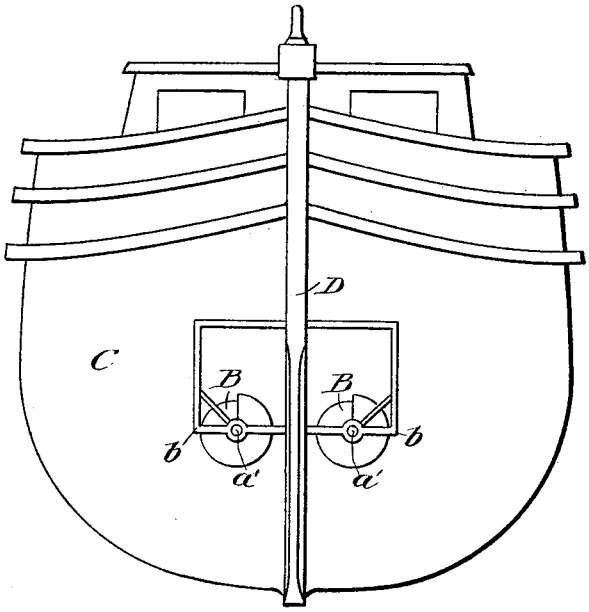
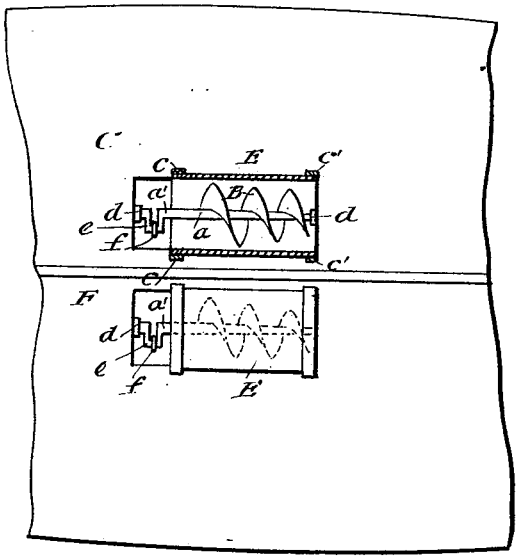


Fig. 4.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

ALFRED CONRAD, OF PATCHOGUE, NEW YORK, ASSIGNOR TO HIMSELF AND SANFORD WEEKS, OF SAME PLACE.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 386,966, dated July 31, 1888.

Application filed November 21, 1887. Serial No. 255,745. (Model.)

To all whom it may concern:

Be it known that I, ALFRED CONRAD, of Patchogue, in the county of Suffolk and State of New York, have invented an Improved Screw-Propeller, of which the following is a full, clear, and exact description.

My invention relates to screws for the propulsion of vessels. Its objects are to provide a screw which may be applied to any vessel using steam-power, either as a single or as twin screws, occupying the usual position, or in other positions, without in either case requiring material alteration in the construction of the vessel for the purpose, which will secure a greater speed of the vessel than any of the screws now in use; and, further, to provide a screw for application to canal-boats, securing great speed for the latter, while at the same time lessening or preventing the wash of the water against the banks of the canal.

Heretofore screw-propellers have been constructed with a hub or shaft from which radiate two or more curved blades, with a shaft or hub from which radiate curved blades arranged in sets of two or more, the width of the blades of each set increasing from the inner to the outer end of their hub or shaft, or with a shaft or hub having one or more longitudinal flanges, either of open twist or auger twist form, and of the same width throughout their length. The two first-mentioned forms are disadvantageous for use on canal-boats, inasmuch as the beating and churning action of their blades has a tendency to cause the water to wash against and undermine the banks of the canal. Of the latter-mentioned forms some have either been arranged in an opening in the vessel immediately over the keel, or in openings in the vessel at either side of the keel, in each instance requiring a special construction of the vessel for their accommodation. Others thereof have been arranged either as a single screw at the stern of the vessel, inclosed in a casing having its smaller end toward the vessel's bow, or with such single screw arranged and incased as specified, and two composite screws, each made up of two of such single screws placed with their larger ends in opposition, located at either side of the bow of the vessel and similarly incased. In each instance a special construction of vessel is required for their reception and use. The form of the casing used causes considerable loss of power of the screw, because of the opposition presented to the entrance of the water to the casing and the reduction of the width of the flanges of the screw at the exit of the casing.

My invention consists in the novel construction and arrangement of the screw-propeller, as hereinafter particularly described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of part of the hull of a vessel, showing my improved screw applied. Fig. 2 is an enlarged side view of my improved screw in place on the propeller-shaft and incased in a hood, the hub of the screw and the shaft being partly broken away. Fig. 3 is an end view showing two screws applied to the stern of a vessel; and Fig. 4 is an inverted plan view of a vessel, showing two screws applied to it at either side of its keel amidships.

The screw A has a cast iron or steel hub, *a*, of tapering form, axially bored from end to end to adapt it to be fitted upon the screw-shaft *a'* of the vessel, suitable transverse apertures, a^2, being provided in said hub to receive set-screws or bolts a^3 for securing it upon said shaft. Integral with said hub is cast a continous helical flange, B, preferably at an angle of forty-five degrees to said hub, the faces of said flange being narrowest at the smaller end of the hub, gradually increasing in diameter toward the larger end thereof, following a curve similar to that of a wood-screw. The bore of the hub *a* may be made of such diameter as will adapt the screw to be fitted to any screw-shaft, and the length of the hub is such that the flange shall have not less than one and one-half convolution between its extremities. It will thus be seen that my improved screw acts with increasing force upon the water from its tapering to its enlarged end, instead of increasing and then gradually decreasing, as in the case of the composite flanged screws herein-

before mentioned, forcing the water as it is acted upon by the screw against the backwater, whereby great speed of the vessel may be attained, and, the action of the screw being steady and even, the quivering or shaking of the vessel incident to the use of bladed screws is to a very marked degree prevented.

When a single screw constructed as described is to be used upon a vessel, C, provided with the usual shaft, *a'*, connected to the engine, it will be fitted by the bore of its hub upon said shaft between the stern-post D and the hull of the vessel in the usual position, with its smaller end toward the bow of the vessel, and secured to said shaft by the bolts or set-screws above specified, or in any other suitable manner. When two of such screws are to be applied to a vessel having twin shafts *a'*, said shafts will have their bearings at each side of the stern-post in hangers or supports *b*, of any suitable form, secured to the hull and stern-post, respectively, without requiring in either case any alteration in the hull of the vessel, and the screws will be arranged and secured upon said shaft as hereinbefore described.

In applying the screw to a steam canal-boat, it is arranged and secured upon the screw-shaft, as specified, in the usual position, and is incased in a metal hood, E, circular in form, open at both ends, and of a diameter throughout its length from four to six inches greater than the diameter of the screw at the highest part of its flange, and said hood is bolted to the stern-post and hull of the boat in any proper manner. When two screws are used, their hoods will have their support upon the hull of the boat and upon the hangers in which the screw-shafts have their bearings. These hoods, being open at each end, afford free entrance of the water to allow it to be acted upon by the screw and direct the water backward in the line of the course of the boat against the backwater, and, as before stated, increasing the speed of the boat, while preventing the water from washing toward the banks of the canal and undermining them, the action of the screw producing only a slight swell instead of the turbulence accompanying the action of the bladed screws hereinbefore mentioned, and the shaking of the boat is, as before stated, greatly lessened.

Twin screws may, if desired, be applied beneath the hull of the vessel or canal-boat, in which case the keel must be slightly deepened or the hull suitably recessed at each side above the keel, or both changes made. As illustrated in Fig. 4 of the drawings, the screws are arranged at and parallel with either side of the keel F amidships, and secured by set-screws on the screw-shafts, which turn in bearings *d*, of suitable form, secured to the hull, the screw-shafts having near their rear ends cranks *e*, connected by pitmen *f* with the engine within the vessel or boat, and said screws are incased in hoods E, supported from the hull by brackets or hangers *c c'*, of any preferred form.

The shaft-bearings may be of such form as to adapt them to be fixed within each end of the hoods. I prefer, however, to dissociate them therefrom, as shown in Fig. 4 of the drawings, so that there may be no strain upon the hoods, which would have a tendency to displace them and cause them to bind upon and impede the action of one or both of the screws.

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

1. As a new article of manufacture, a screw-propeller having an elongated tapering hub axially bored throughout its length to fit a screw-shaft, and a single continuous perpendicular helical flange integral with said hub, said flange gradually increasing in diameter from the smaller to the larger end of said hub, substantially as shown and described.

2. The combination, with the screw-shaft of a steam-vessel, of a screw-propeller having an elongated tapering hub fitted by its axial bore upon said shaft, and a single continuous perpendicular helical flange integral with said hub, which flange gradually increases in diameter from the smaller to the larger end of said hub, substantially as shown and described.

ALFRED CONRAD.

Witnesses:
ALANSAN PAYNE,
ISAAC G. WILLETTS.