No. 803,671. PATENTED NOV. 7, 1905.

C. G. CURTIS.

MARINE PROPELLER.

APPLICATION FILED JAN. 29, 1903.

3 SHEETS—SHEET 1.

Fig. 1

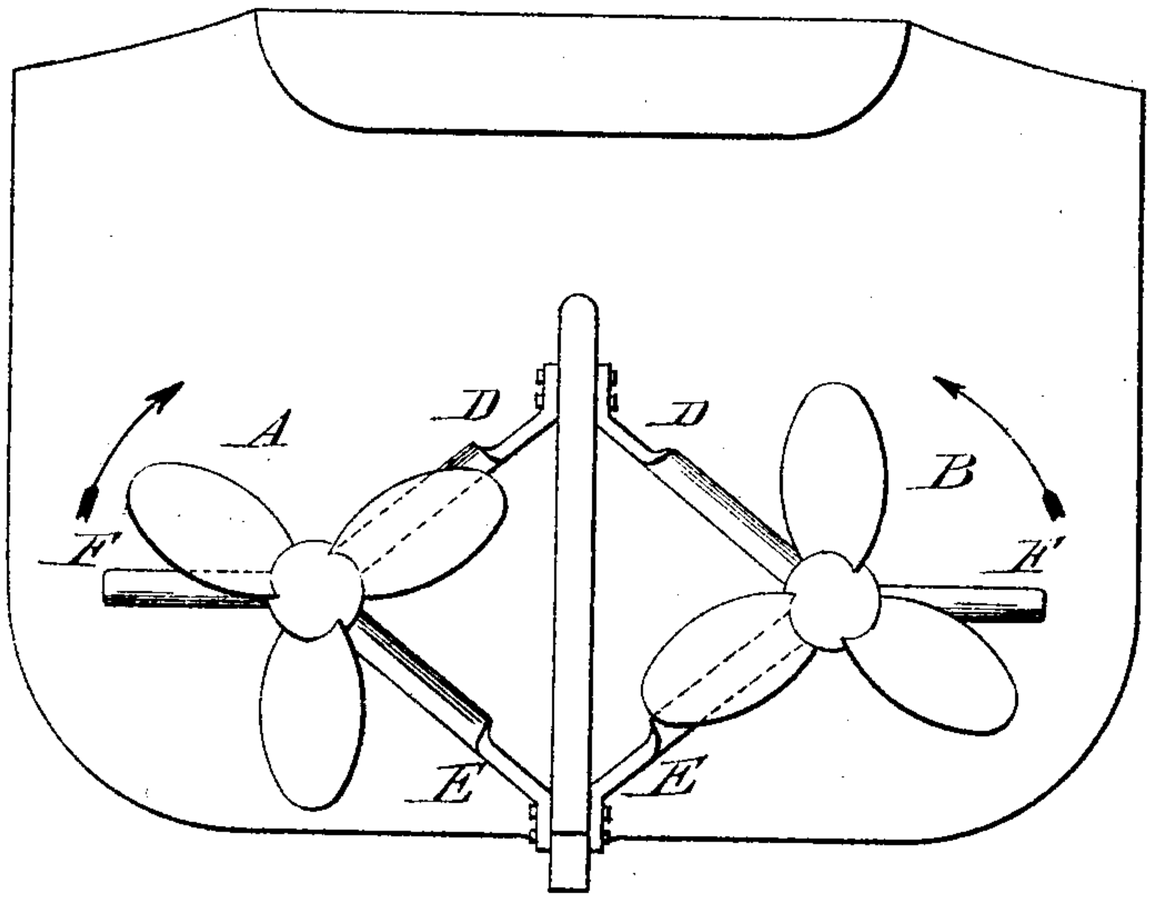

Fig. 2

Fig. 2a

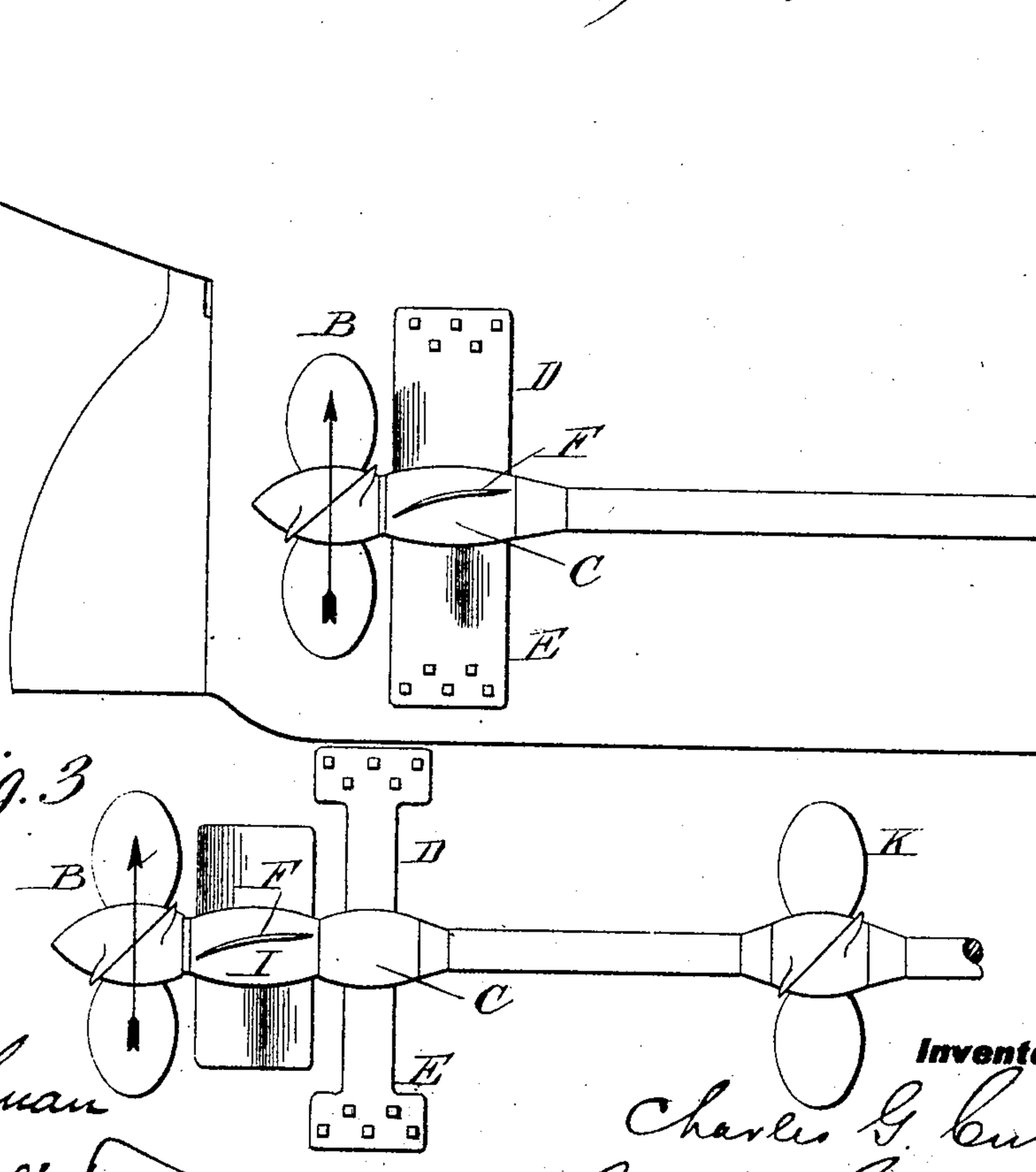

Fig. 3

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3 SHEETS—SHEET 2.

Fig. 4

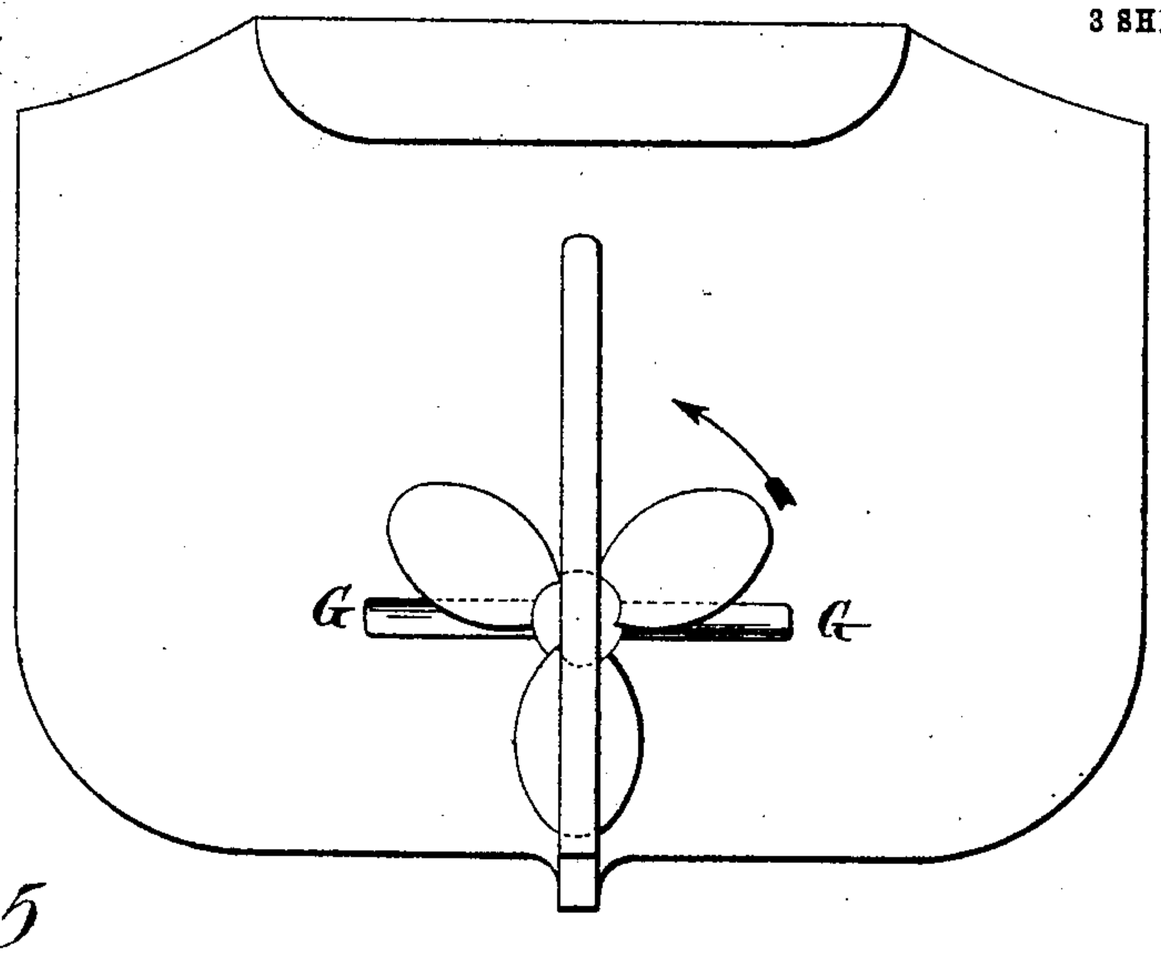


Fig. 5

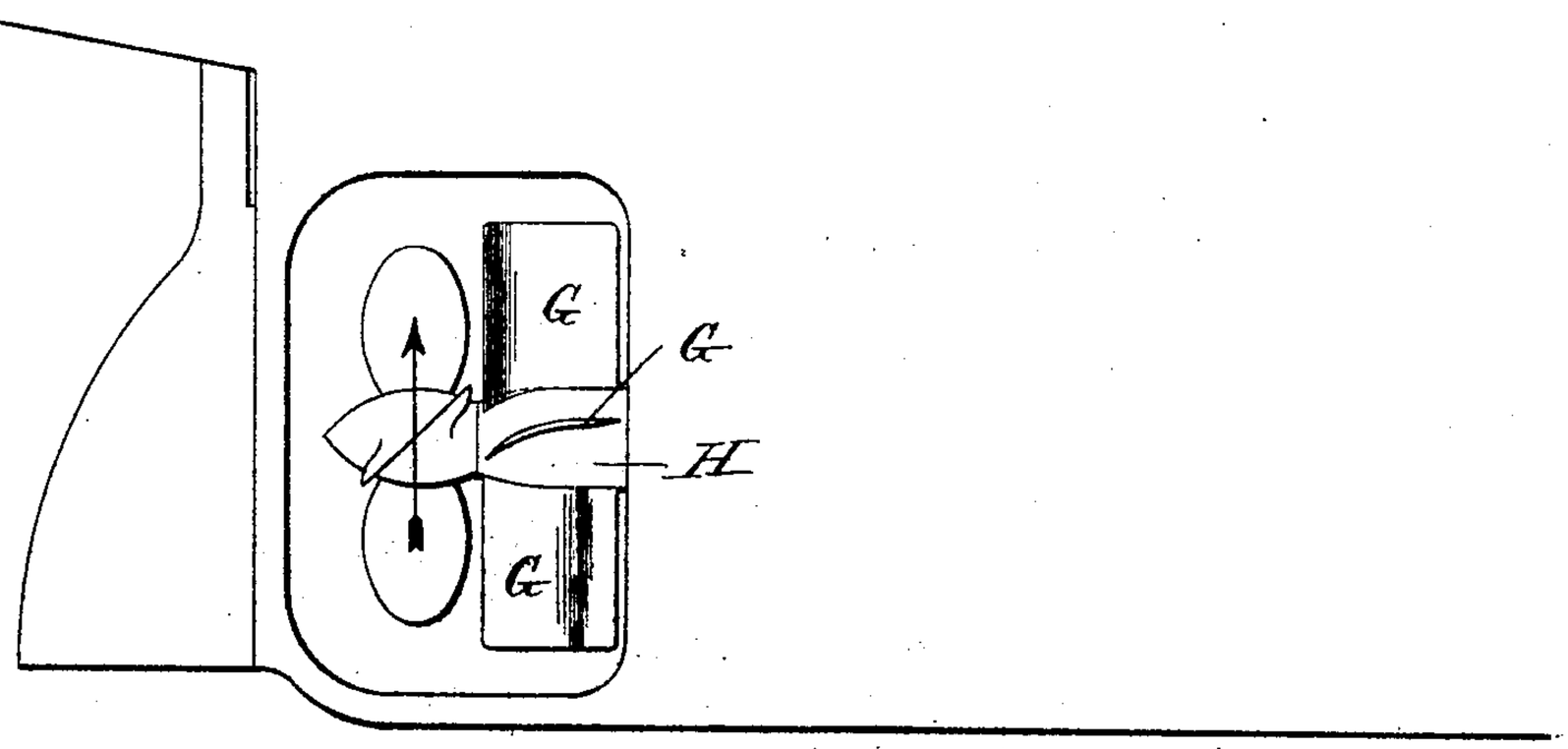
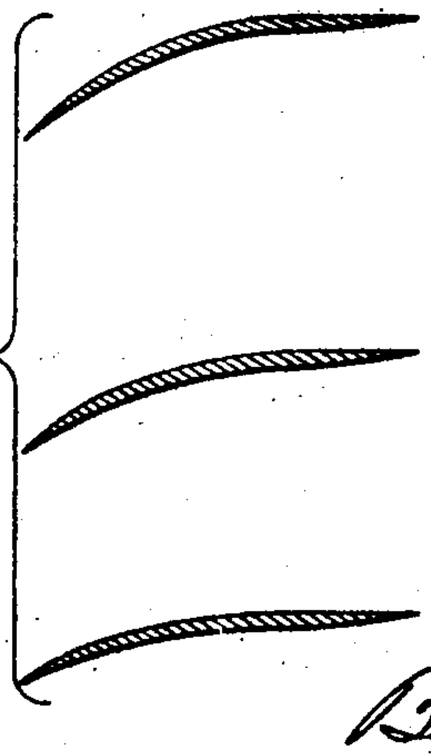


Fig. 6



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3 SHEETS—SHEET 3.

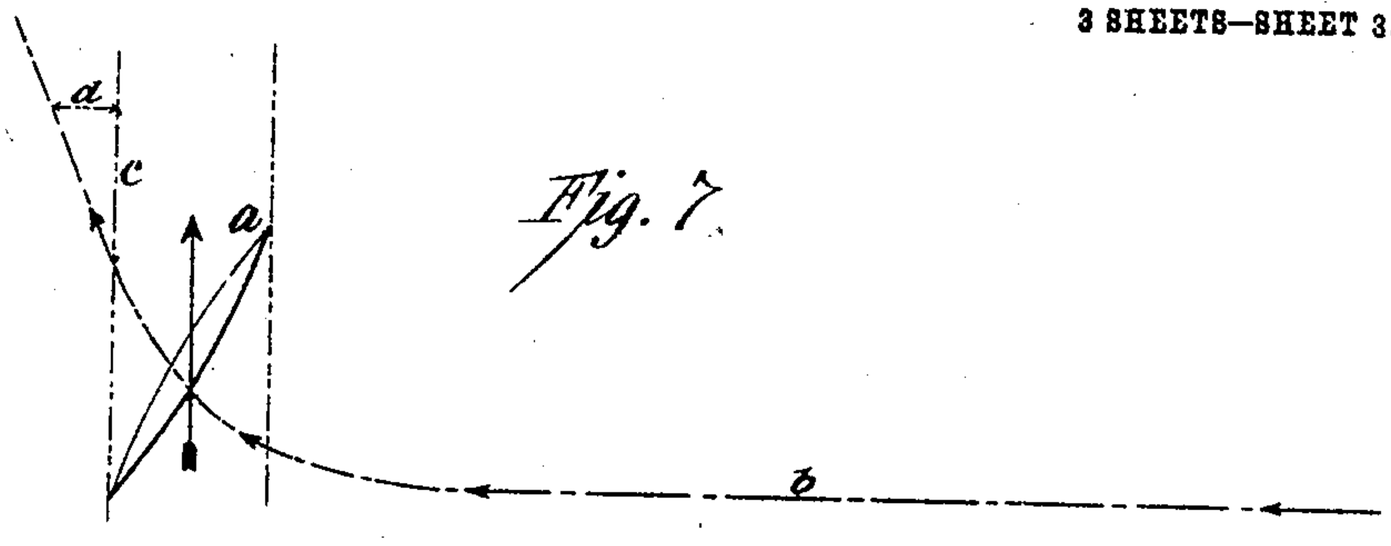

Fig. 7.

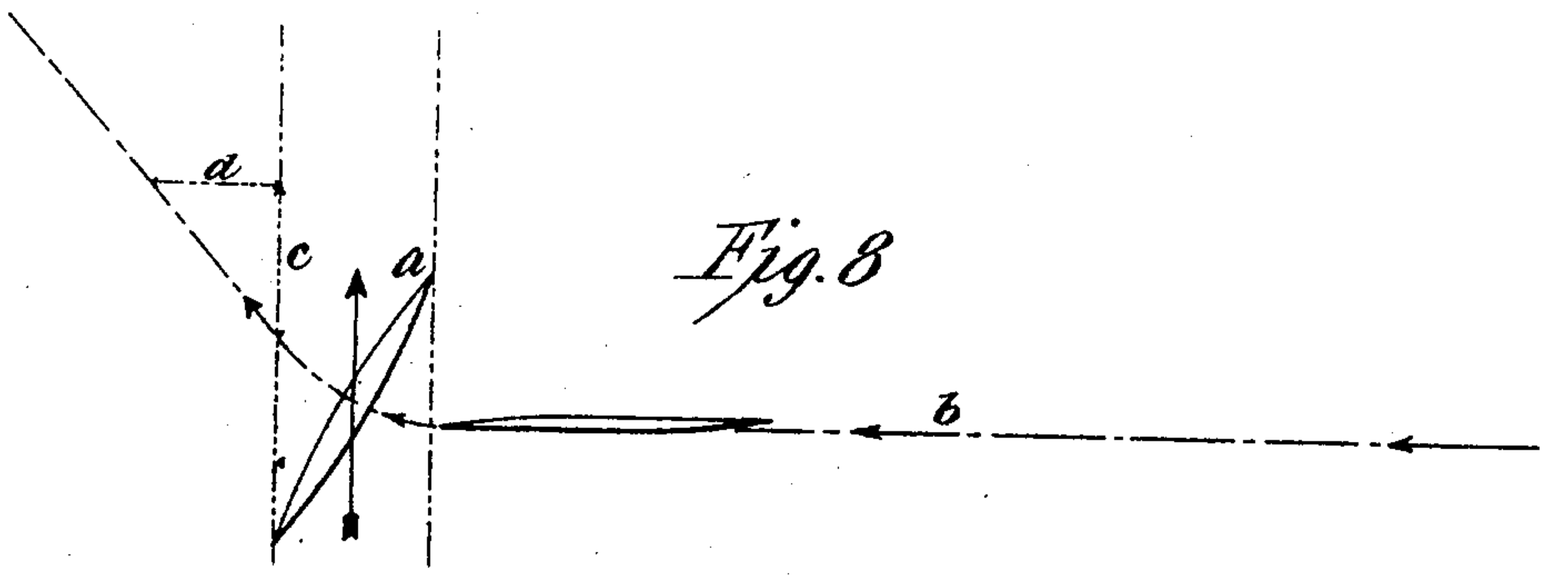

Fig. 8

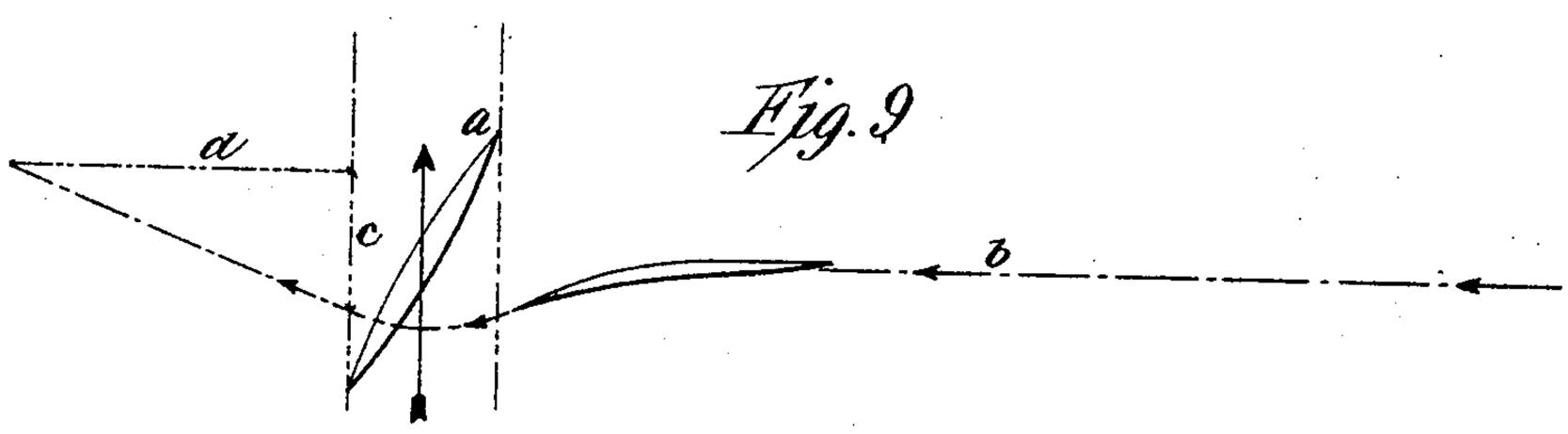

Fig. 9

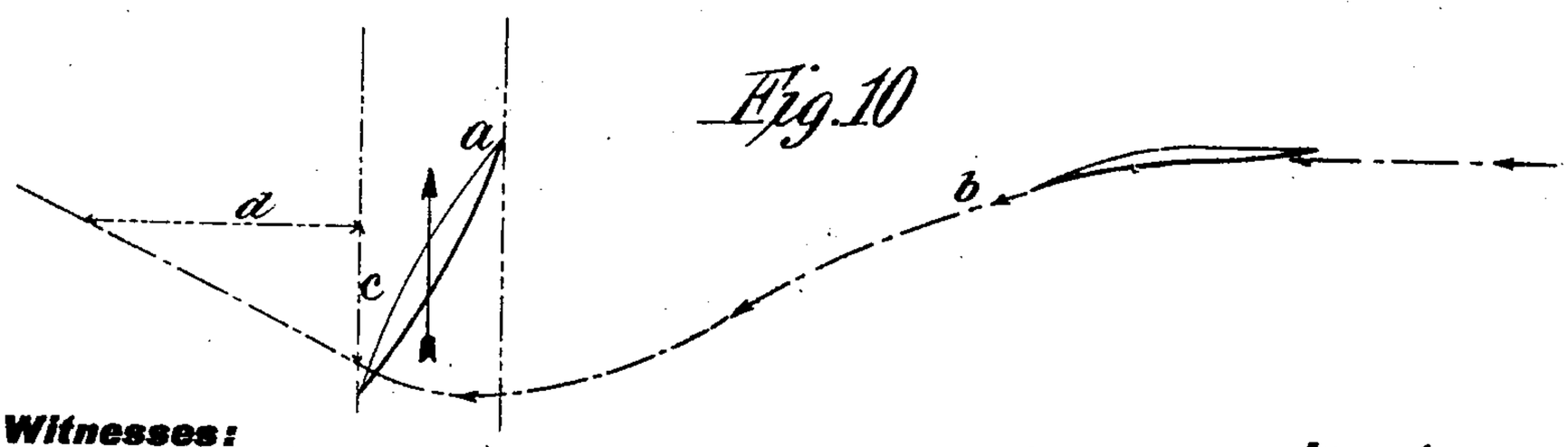

Fig. 10

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UNITED STATES PATENT OFFICE.

CHARLES G. CURTIS, OF NEW YORK, N. Y.

MARINE PROPELLER.

No. 803,671. Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed January 29, 1903. Serial No. 140,981.

To all whom it may concern:

Be it known that I, CHARLES G. CURTIS, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented a certain new and useful Improvement in Marine Propellers, of which the following is a description.

The object I have in view is to improve the efficiency of marine propellers by giving the column of water a spiral or rotary motion before it strikes the blades of the propellers, so as to present it to the blades at the most effective angle. I find that this can be accomplished by the employment of a number of stationary blades radiating from the propeller-shaft and curved or inclined to give the column of water the desired spiral or rotary motion opposite to the rotary motion produced by the propeller itself. In the case of a twin-screw arrangement I prefer to incorporate the guide-blades in the struts which support the stern-bearing of each shaft, such struts being widened for the purpose and given the proper curve or inclination, or such guide-blades may be secured to the struts. I also preferably provide one or more additional guide-blades projecting outwardly from the bearing carried by the struts. In the case of a single-screw arrangement the guide-blades project outwardly from the stern-bearing of the propeller-shaft. With either arrangement the guide-blades may project radially from a collar surrounding the propeller-shaft outside of the stern-bearing, such collar being supported by the stern-bearing.

In the accompanying drawings, Figure 1 is an elevation of the stern of a vessel provided with twin screws and having my stationary guide-blades applied thereto. Fig. 2 is a side elevation of the same arrangement. Fig. 2ª is a cross-section of one of the struts supporting the stern-bearing of the propeller-shaft, showing the stationary guide-blade secured to such strut. Fig. 3 is an elevation from the side, showing the employment of two screws upon one shaft with the stationary guide-blades located between the two screws. Figs. 4 and 5 are a rear elevation and a side elevation, respectively, of a single-screw arrangement with my invention applied thereto. Fig. 6 represents three sections of one of the stationary guide-blades, the top section being taken near the inner end of the guide-blade, the middle section being taken near the center, and the lowermost section being taken near the outer end of the guide-blade. Figs. 7, 8, 9, and 10 are diagrams illustrating the action of the propeller and stationary guide-blades on the column of water.

Referring particularly to Figs. 1 and 2, A and B are the propellers of a twin-screw arrangement. The stern-bearings C are supported by struts D E, formed in one piece therewith and bolted to the hull. These struts are increased in width to form the stationary guide-blades of my invention and are bent into a curved spiral or inclined form to give the column of water a twist or movement of rotation opposite to the rotation produced by the propellers. Instead of being made in one piece with the struts the stationary guide-blades may be separate pieces secured to the struts, as illustrated in Fig. 2ª. One or more guide-blades F, projecting outwardly from the bearing C and formed in one piece therewith, are also preferably employed.

In Figs. 4 and 5, showing a single-screw arrangement, the stationary guide-blades G project outwardly from the stern-bearing H, being formed in one piece therewith. As illustrated in Fig. 3, the stationary guide-blades, instead of projecting directly from the stern-bearing C, may be made in one piece, with a collar I surrounding the propeller-shaft, such collar being secured to and held against rotation by the stern-bearing C. Fig. 3 also illustrates the employment of another propeller K upon the same shaft in front of the stationary guide-blades.

To increase the effect of the stationary guide-blades, these blades may be given a spiral form similar to that of the blades of the propeller, but reversed, the angle being greatest at the inner ends of the blades and least at their outer ends, as illustrated by the sections in Fig. 6.

The action of a propeller upon the column of water without the stationary guide-blades is illustrated in Fig. 7. The propeller-blade *a* is assumed to be moving in the direction of the large arrow, while the direction of flow of the column of water is illustrated by the dotted line *b* and the arrows incorporated in that line. The rotary motion of the column of water which the propeller produces begins to affect that column some distance in advance of the propeller, the column being gradually turned, as indicated by the line *b*, in the direction of the rotary motion of the propeller and being projected from the propeller with a motion which is largely one of rotation and at a large angle to the axis of the propeller.

The rotary component (represented by the line *c*) is large compared with the backward component, (represented by the line *d*.) If, however, a straight guide-blade is employed, as illustrated in Fig. 8, which prevents the column of water from being turned until it reaches the propeller, the column of water is delivered by the propeller at a less angle or parallel with the axis, and the rearward component is increased relative to the rotary component. If a curved or inclined guide-blade is employed in accordance with my invention, as illustrated in Fig. 9, the column of water is actually given a motion of reverse rotation before it reaches the propeller and is delivered by the propeller at a reverse angle, thus increasing still further the rearward component relative to the rotary component, and so augmenting the thrust.

In Fig. 10 is illustrated the action of the guide-blades of my invention when removed from the propeller a sufficient distance to prevent damage from objects clogging between the propeller and the guide-blades or to avoid the shock or vibration arising from the too great proximity of the edges of the moving and stationary blades.

What I claim is—

1. The combination with a marine propeller, of curved or inclined stationary guide-blades located in front of the propeller and radiating from the propeller-shaft, substantially as set forth.

2. The combination with a marine propeller, of curved or inclined stationary guide-blades located in front of the propeller and projecting radially from the stern-bearing of the propeller-shaft, substantially as set forth.

3. The combination with a marine propeller, of curved or inclined stationary guide-blades located in front of the propeller and incorporated in or secured to the struts which support the stern-bearing of the propeller-shaft, substantially as set forth.

4. The combination with a marine propeller, of curved or inclined stationary guide-blades located in front of the propeller and incorporated in or secured to the struts which support the stern-bearing of the propeller-shaft, and one or more additional guide-blades projecting outwardly from the said bearing, substantially as set forth.

5. The combination with two propellers on the same shaft, of curved or inclined stationary guide-blades located between the propellers, substantially as set forth.

This specification signed and witnessed this 27th day of January, 1903.

CHARLES G. CURTIS.

Witnesses:

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JOHN LOUIS LOTSCH.