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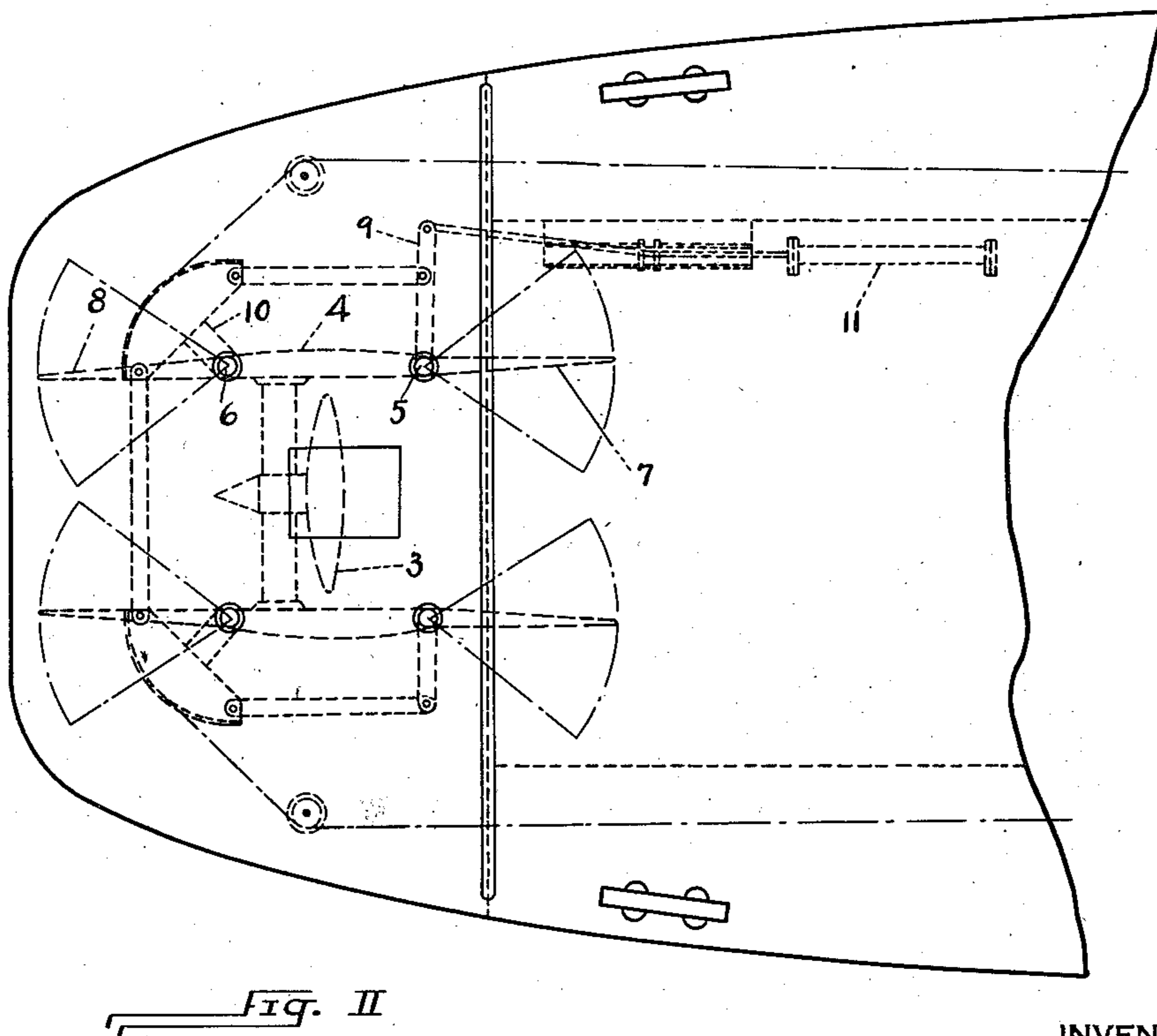
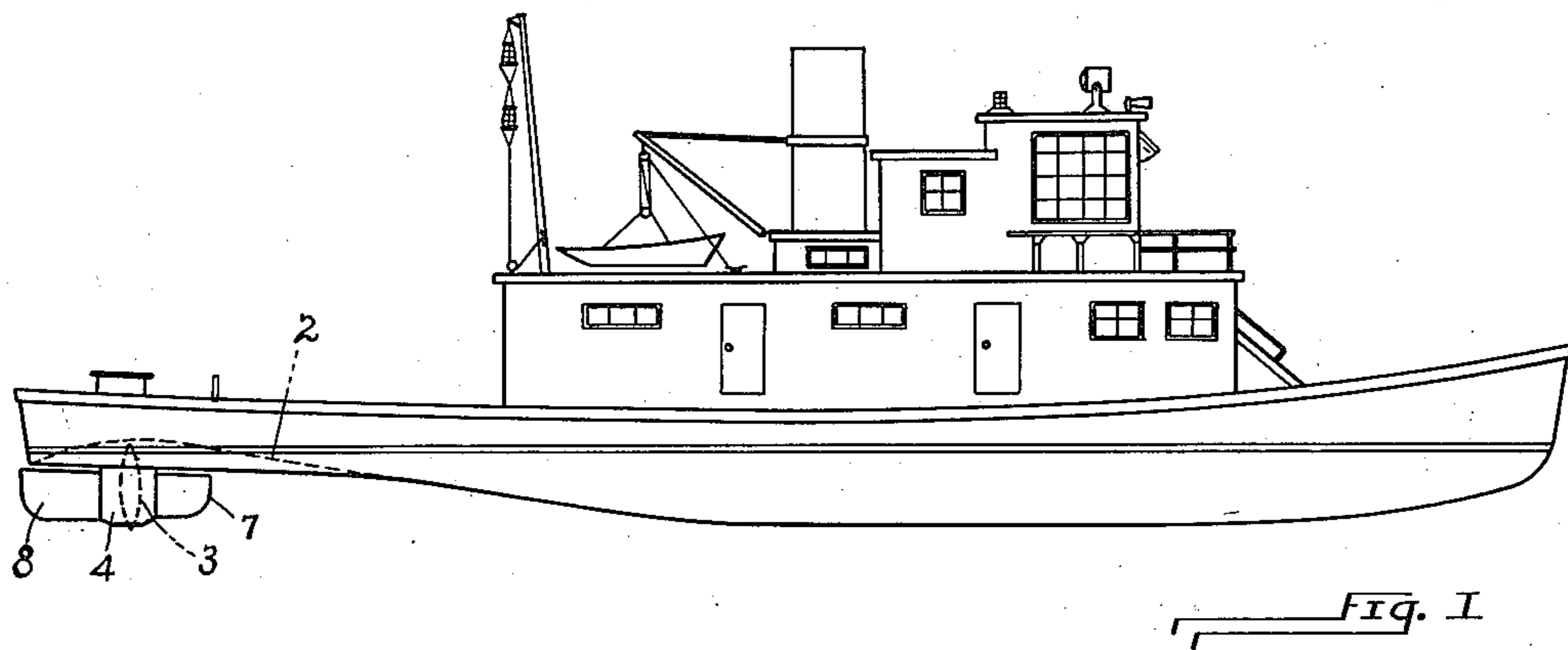
A. J. DAWSON

2,011,618

BOAT

Filed May 5, 1934

3 Sheets-Sheet 1



INVENTOR  
*Albert J. Dawson*  
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*Chruty and Wharton*  
his ATTORNEYS

**Aug. 20, 1935.**

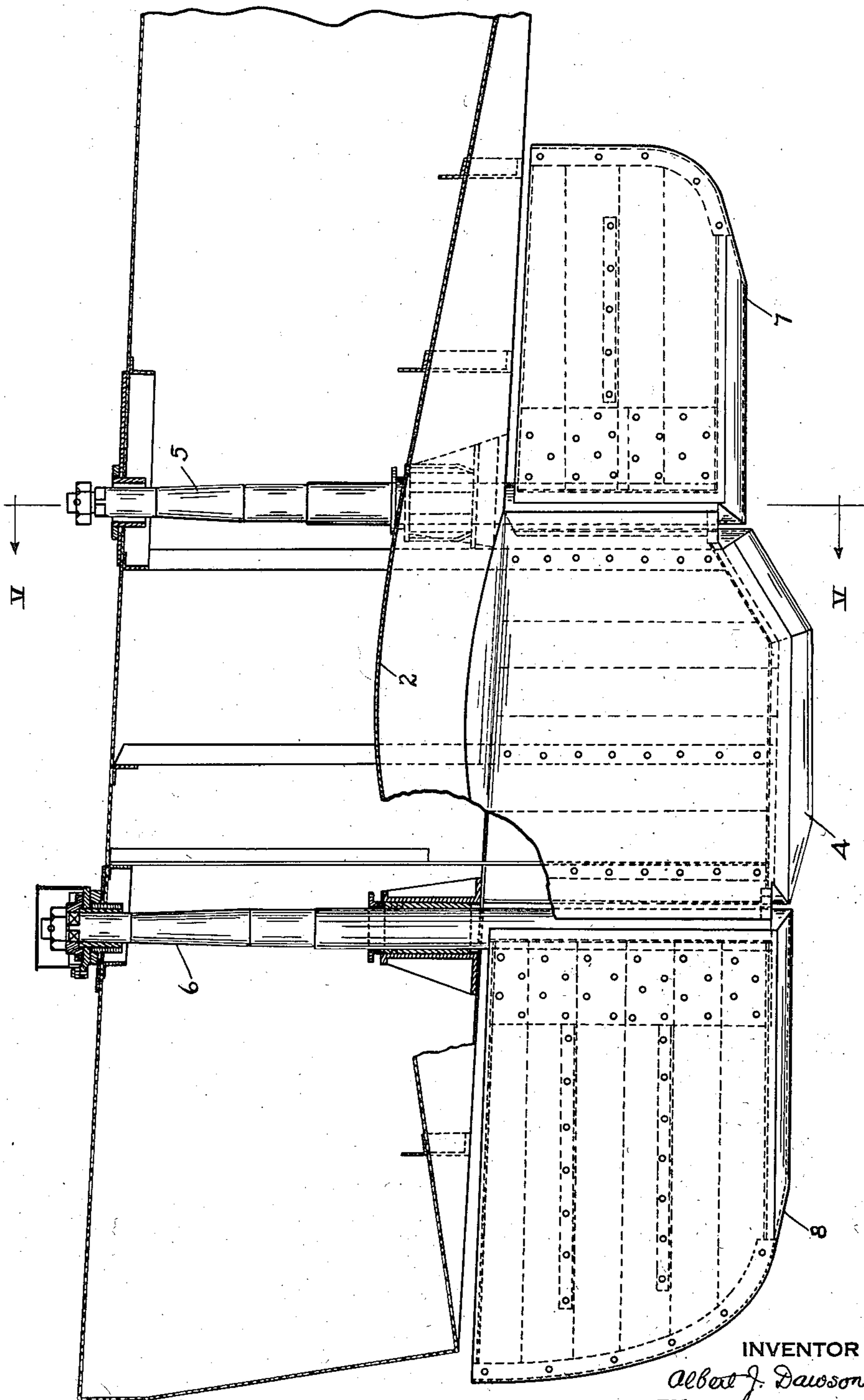
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### III. ITQ:

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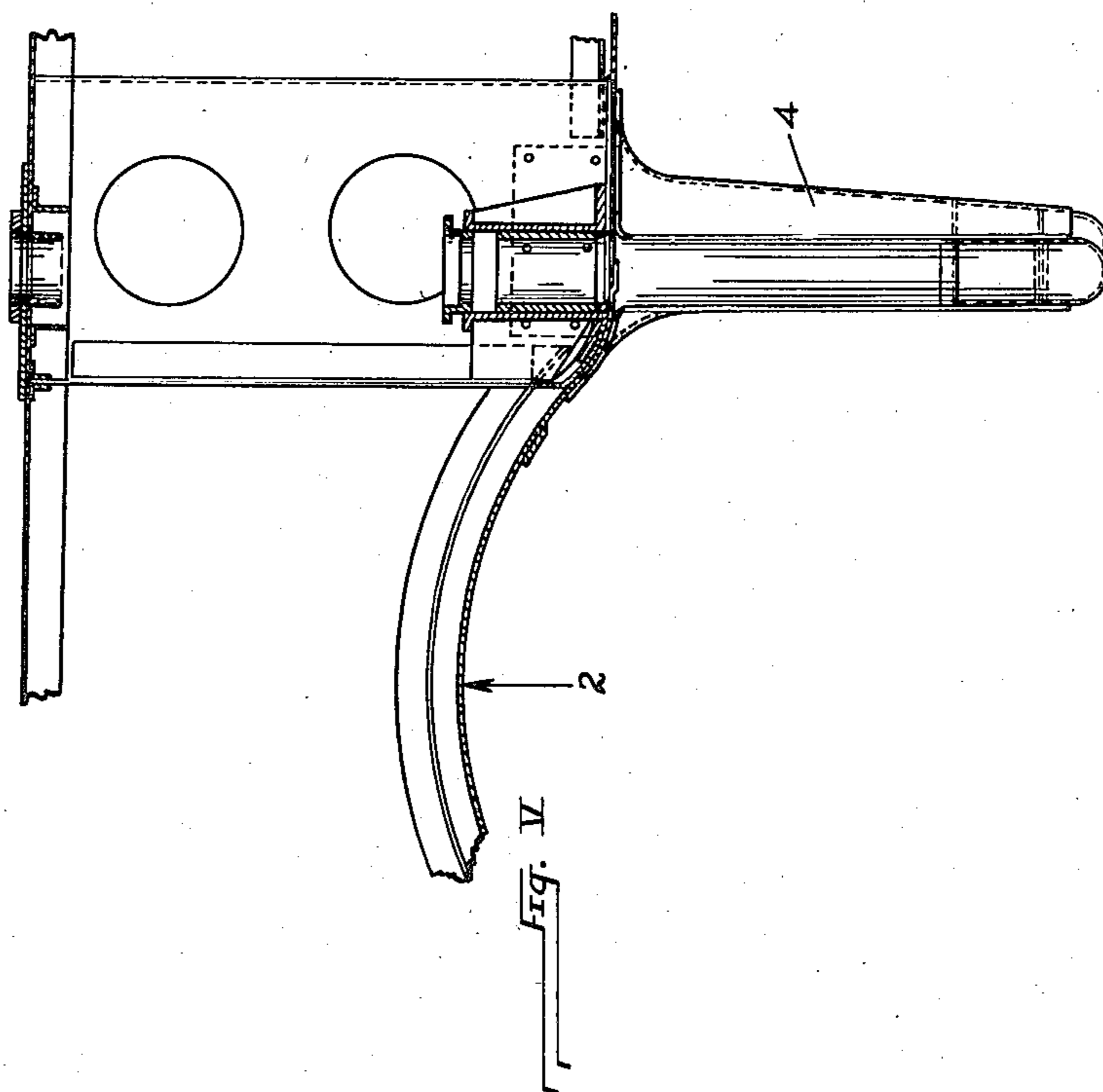
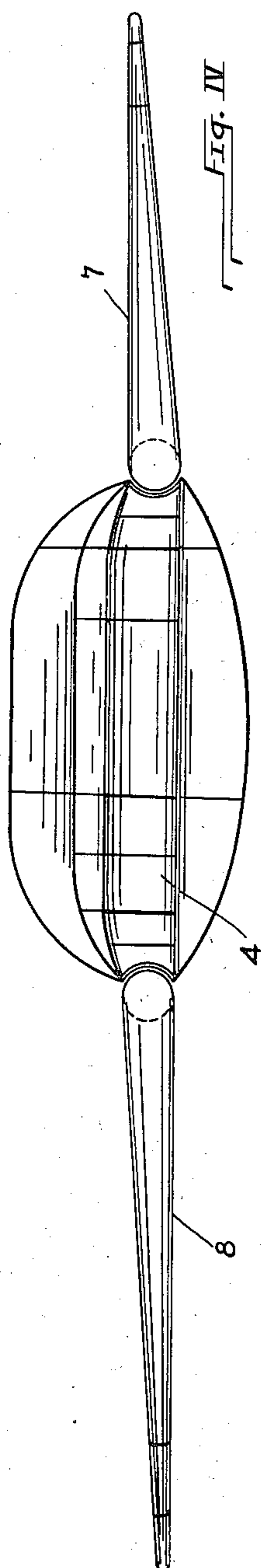
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3 Sheets-Sheet 3



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Patented Aug. 20, 1935

2,011,618

# UNITED STATES PATENT OFFICE

2,011,618

BOAT

Albert J. Dawson, Sewickley, Pa., assignor to The Dravo Contracting Company, a corporation of Pennsylvania

Application May 5, 1934, Serial No. 724,066

3 Claims. (Cl. 114—163)

This invention relates to boats, and particularly to tunnel boats, and consists in an improvement in architecture, in consequence of which the boat is rendered more fully responsive to its helm, particularly when driven astern.

The invention is illustrated in the accompanying drawings. Fig. I is a view in side elevation of a boat in which the invention is embodied. Fig. II is a fragmentary view to larger scale, showing in plan from above the stern portion of the boat of Fig. I, and illustrating diagrammatically, and in association with those architectural features that characterize the invention, the steering gear of the boat. Fig. III is a view to larger scale of the stern portion of the boat, seen in vertical and medial section. From this figure the propeller has been omitted; the skeg and rudder structure on the port side are seen in side elevation; and, additionally, on other planes of section, the rudder stocks are shown in detail. Fig. IV is a plan view from beneath of the skeg and rudder assembly of Fig. III. Fig. V is a fragmentary view in vertical and transverse section on the center line of the stock of the forward rudder element, the plane of section being that indicated at V—V, Fig. III. From this figure, however, the rudder element itself is absent.

The hull of the boat illustrated is shaped at the stern with a tunnel whose peak is indicated at 2 (Figs. I, III, and V), and within this tunnel the propeller 3 (diagrammatically indicated in Figs. I and II) is assembled, to rotate in usual manner. To such an assembly a rudder (ordinarily a double rudder) is added. And such an assembly, with the added rudder, is effective, so far as concerns the forward travel of the boat. When, however, it comes to travel astern, the lateral thrust imparted to the boat in one direction or the other by the rotation of the propeller is of such relatively great magnitude, particularly in association with a tunneled stern, that the rudder is rendered of little or no effect, and the direction of travel is not under adequate control. It is the object of this invention to afford adequate control of the boat in traveling astern.

In the boat of my invention the tunnel in the stern is extended by the formation of twin skegs 4 that extend forward and aft and downward on either side of the propeller (when the propeller is in position). These skegs, so situated, serve to meet and to direct downwardly the streams of water delivered by the rotating propeller,—the streams that, otherwise driven laterally, would (as in the usual construction) render the rudder relatively ineffective.

The skegs 4 at their fore and aft edges stand free of the hull; and at these edges are mounted the stocks 5 and 6 of the forward and after blades 7 and 8 of two-part rudders. As will be perceived on reference to Fig. II, the two-part rudder is duplicated, on the port and starboard sides.

The skegs 4, together with the arch of the tunnel, constitute a shrouding that surrounds the rotating propeller on all sides, save below; in consequence, the transverse thrust of the rotating race of the propeller is turned and directed downward, and, as has been said, the vessel's helm is in consequence relieved of a disturbing influence.

The arrangement of skegs and rudders is such that stream flow is confined in a fore-and-aft direction, and in consequence the angle of attack of the rotating propeller upon the so confined water is most efficient.

The stocks 5 of the forward rudder blades 7 are provided with arms 9; and the stocks 6 of the after rudder blades 8 are provided with arms 10; and arms 9 and 10 are articulated, as indicated in Fig. II, to the end that the whole rudder assembly shall swing as a unit, the forward and the after blades in simultaneous and oppositely directed swing, in response to the movement of a steering engine 11. The steering action produced by the simultaneous swing of the four blades of the double rudder is such that, for either direction of motion, the wheel-race as a unit is shifted and the direction of its extent is changed as a unit, without undue turbulence, and without reduction of propulsion efficiency. Manifestly the forward pair of blades 7 and the after pair of blades 8 may be separately articulated, and means may be provided for swinging one pair or the other separately, or both in unison.

The skegs are shown as plane-surfaced toward the propeller. It will be understood that the surfaces of the skegs may be minutely modified in shape and that the width of the space defined by and between them may be variable, decreasing and widening, in accommodation to stream-flow lines.

The rudder blades will be seen to be tapered from the stocks upon which they are carried to their free edges. The drawings show (Figs. II and IV) minute adjustment of the rudder blades in their relative positions. The after blades 8 of the double rudder converge slightly, to afford a wheel-race of uniform width to the tips of blades 8, in consequence of which the vessel's response to the helm, when being propelled in the ahead direction, will be increased; and, correspondingly,

the forward blades 7 are adjusted in slightly diverging assembly in order to set these rudders more nearly in the line of average stream-flow toward the propeller.

5 The elaboration of the double rudder, with two forward and two after blades, with such interconnection as has been described, to effect organized and simultaneous swing, permits such a proportioning and adjustment that the forces tending  
10 to resist the swinging of the several elements are balanced one against another, with the consequence and effect that relatively small power is required at the helm, to swing the rudder and steer the vessel.

15 I claim as my invention:

1. A boat of tunnel type, provided with twin skegs constituting downward extensions of the

tunnel walls, a propeller arranged in the space between said skegs, and two rudder blades arranged one at the forward and the other at the after edge of each skeg.

2. A boat of tunnel type, provided with twin 5 skegs constituting downward extensions of the tunnel walls, a propeller arranged in the space between said skegs, two rudder stocks arranged at the forward and after ends of each of the two skegs, a rudder blade borne by each stock, and 10 means for turning simultaneously the four rudder stocks in one or the other direction of turning.

3. The structure of claim 2, the wheel-race defined by and between skegs and rudder blades 15 being wider at the forward than at the after end.

ALBERT J. DAWSON.