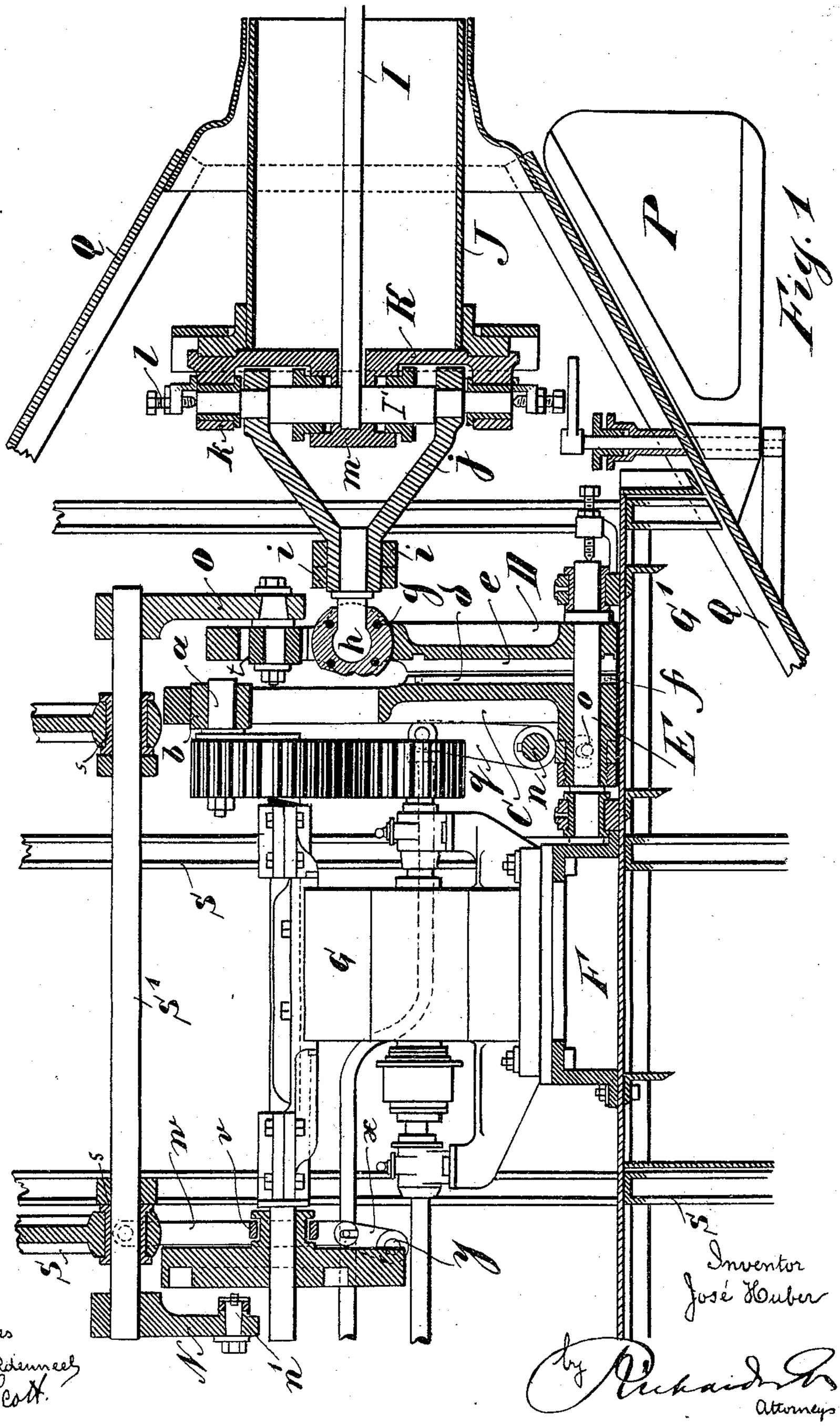
(No Model.) 4 Sheets—Sheet 1.

J. HUBER.

OSCILLATING PROPELLER.

No. 566,910. Patented Sept. 1, 1896.



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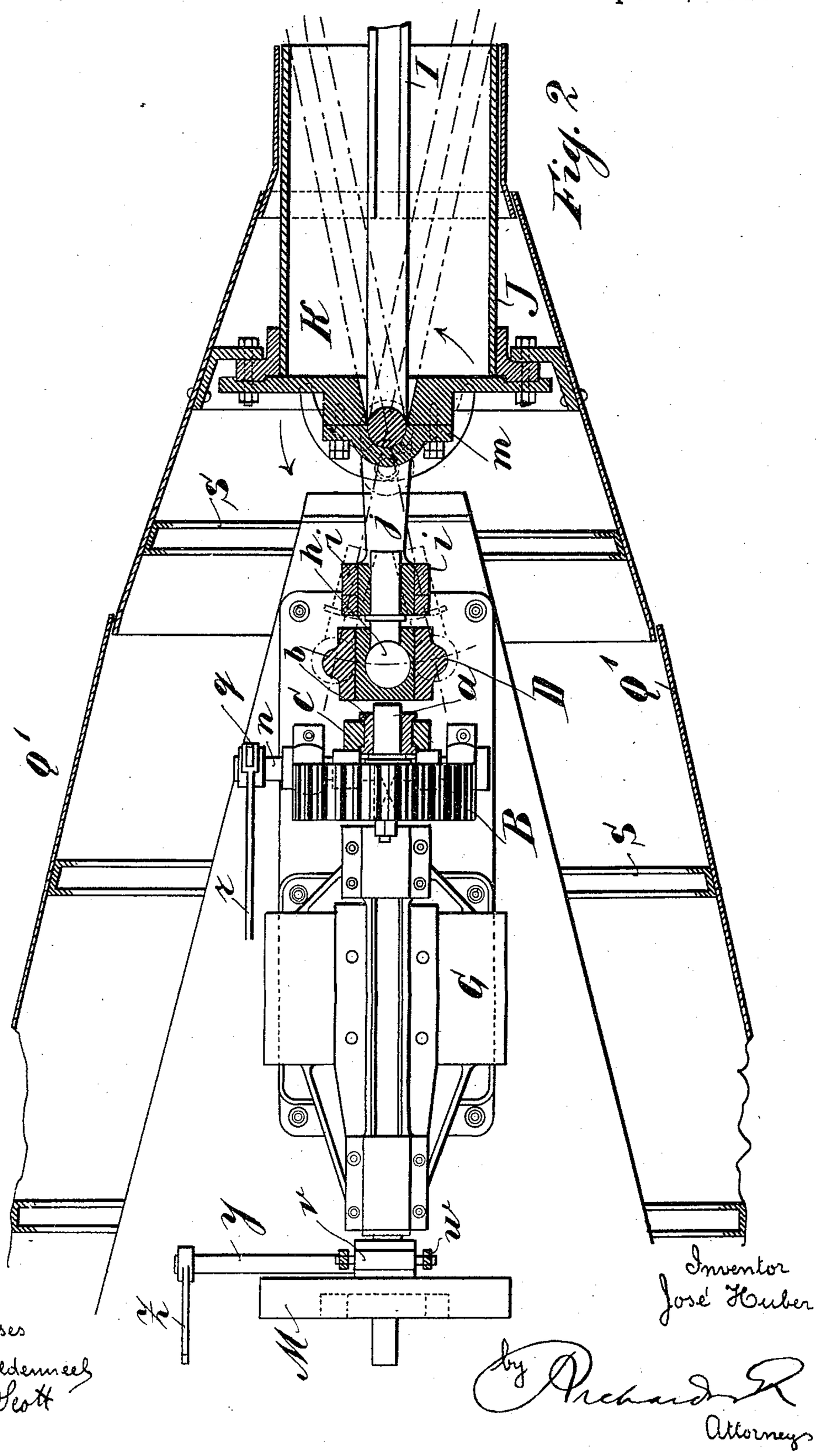

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(No Model.) 4 Sheets—Sheet 3.

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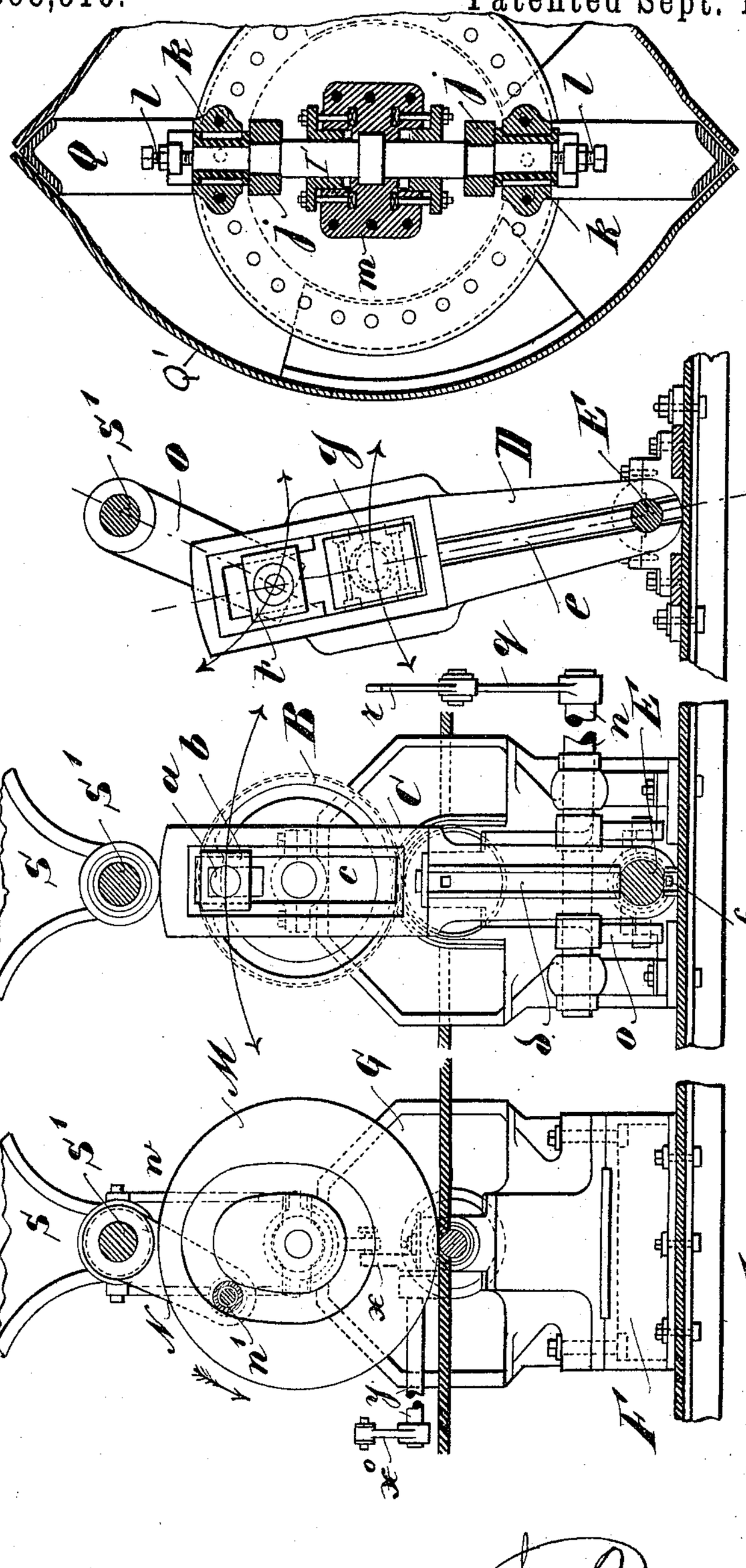

Fig. 6

Fig. 5

Fig. 4

Fig. 3

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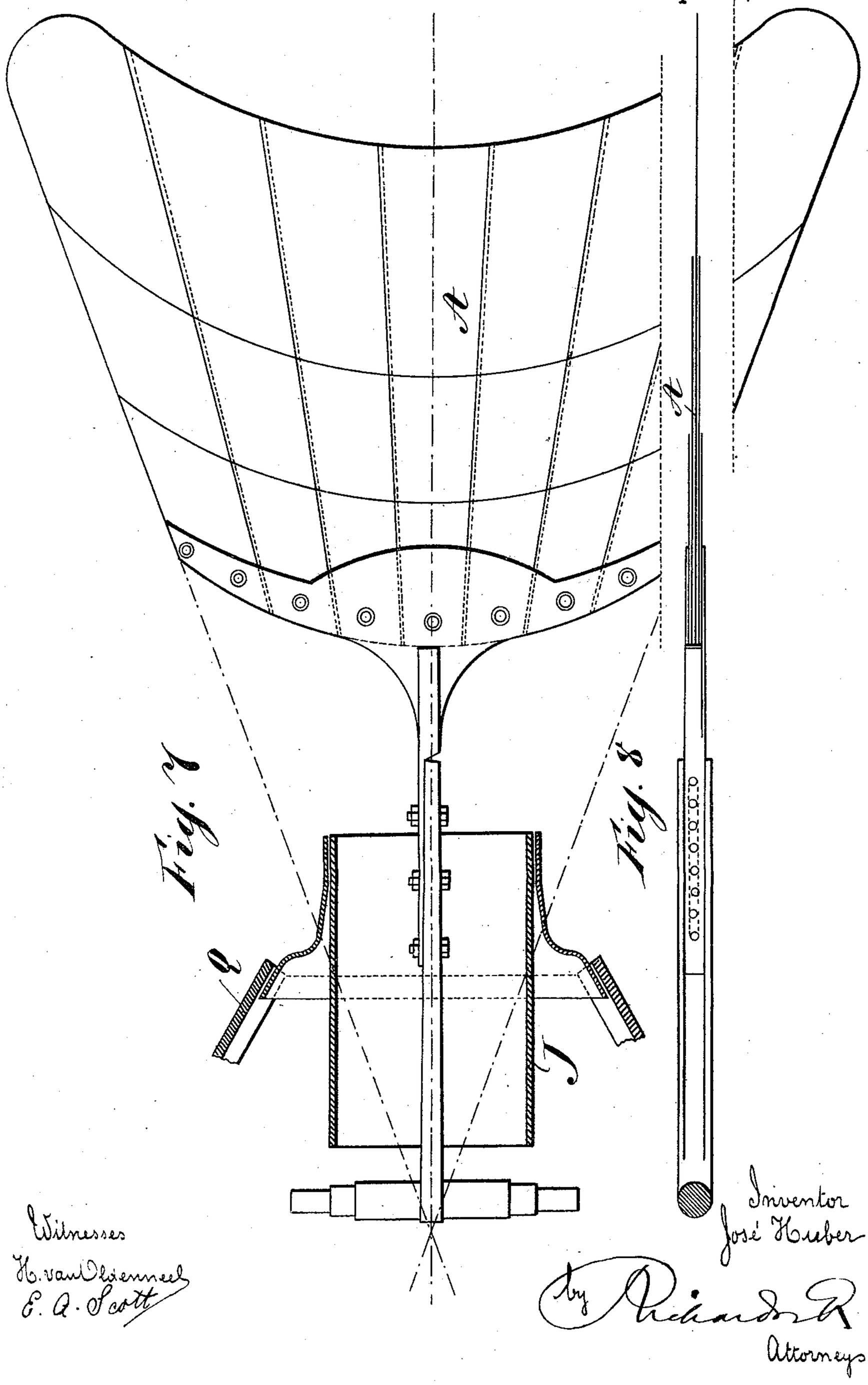

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UNITED STATES PATENT OFFICE.

JOSÉ HUBER, OF SANTIAGO, CHILE.

OSCILLATING PROPELLER.

SPECIFICATION forming part of Letters Patent No. 566,910, dated September 1, 1896.

Application filed February 29, 1896. Serial No. 581,340. (No model.)

To all whom it may concern:

Be it known that I, JOSÉ HUBER, a citizen of Germany, and a resident of Santiago, Chile, have invented certain new and useful Improvements in Oscillating Propellers, of which the following is a specification.

The characteristic feature of the present invention is that the propelling apparatus used hitherto, such as the screw or paddle-wheels, is dispensed with.

In the drawings, Figure 1 shows a longitudinal section of the mechanism. Fig. 2 shows a diagram of the device, partly in section. Figs. 3, 4, 5, and 6 are detail views. Figs. 7 and 8 show the propelling-rudder in profile and plan view, respectively.

The illustrated propelling mechanism is especially intended for submarine vessels, and the apparatus therefor, together with the electromotor, is located in the aft part of the boat.

The extreme highest and lowest limiting edges of the ship's body are reinforced by angle-irons Q, Figs. 1 and 6.

The plates on the stern of the ship (indicated by the letter Q′) are oval, as is the entire body, Fig. 6. In order to protect the same against outside pressure, these plates are reinforced by the channeled irons S. The rear point of the ship's body ends in a tube J, which is riveted to the angle-iron Q and the sheet-plates of the ship's body by means of an intermediate piece. This tube receives the paddle-shaft I, which moves to the right and to the left in a horizontal plane in the free space of the tube. This shaft I ends in a cross-axle I′ and forms, with the paddle-rod, a T-shaped piece. Said cross-axle, which is in a vertical line to the body of the ship, is supported in the bearings *k k*, made of one piece with the locking-cover K, provided in its center with a longitudinal channel, which allows the motion of the paddle-shaft passing through the same. A cover *m* is provided as a protection against water, this being removable and containing a tightening two-part stuffing-box, as shown.

The set-screws *l* serve to adjust precisely the position of cross-axle I′ of the paddle-shaft and thereby the rudder also.

The power required to oscillate the paddle is furnished by an electric motor through the wheel B. A pivot *a*, adjustable toward the center, is fixed to the cog-wheel B, and its opposite end, through the casing *b*, moves up and down in the slot *c* of the lever C and oscillates the same on the horizontal shaft E. The shaft E also serves as a pivotal point for a second lever D, which is connected or disconnected with the first by a ratchet. Figs. 1 and 2 show both levers disconnected. Their connection is established by attracting the draw-rod *r*, which catches a lever *q*, which at its free extremity is wedged upon a shaft *n*. Two fork-shaped jaws *o* are, further, fixed upon this shaft and engage the trunnions of a ring loose upon the nave of the lever C. By tightening the rod *r* the lever C, by its ribs *d*, will be brought near the face of the lever D. At the moment that the projecting rib *d* strikes the groove *e* in the lever D the said rib will enter the groove and the lever C will carry along the lever D, which will then execute the same motions as the former.

In order to prevent friction between the parts during the coupling of the levers C and D, they are provided at the top and bottom of the rib with antifriction-rollers *f*, Figs. 1 and 4, and thus if the levers are not in perfect alinement when they are brought toward each other the face of one will slide easily over the face of the other until they are perfectly alined, when they will interlock. The oscillating motion of the lever D is transmitted directly to the paddle-shaft through the lever *j j*, ending in a ball *h*, fitting the casing *g* of the lever D, and by means of the ball-and-socket joint thus formed acting upon the lever *j j*. This lever *j j* is rigidly connected with the movable paddle-shaft I′ and rod I, and transmits the same motion to the propelling-rudder A, Figs. 7 and 8.

The double-armed lever *j j* is permanently connected with the neck of the ball *h* by the rings *i i*, and the union of the double-armed lever *j j* with the axle of the rudder-shaft is also permanent. The connecting and disconnecting of the levers C and D is necessary in order that when the motive power stops suddenly the propelling-paddle A will not be kept in a lateral position, which would bring the ship out of its course. By suddenly releasing the paddle-arm the paddle will be drawn in a straight position by the motion of the ship without having any influ-

ence upon its direction. The motion produced by the described mechanism is, as has been stated, a horizontal motion oscillating laterally from the center of the vessel, by which the propelling of the same is effected.

For rapidly changing the course of the ship a rudder P, Fig. 1, is used, and in addition to this the rudder-shaft is capable of being oscillated to the right of the center or to the left, as desired, to act as a steering-propeller, the mechanism of which is described hereinafter. The shaft of the wheel B carries at its other extremity a disk M, provided on its surface with an eccentric groove. By operating the lever Z this disk M can be drawn forward until the pin n' of the lever N, Fig. 1, engages the eccentric groove of the disk M. The pin n' is protected against friction by means of a roller at its working extremity. When the motor is working, a certain lateral motion will be imparted to the arm N by means of the eccentric groove in the disk and the pin n'. The shaft S', upon the extremity of which the lever N is wedged, bears upon the carriers s s, the latter being fixed to the ship's body. The shaft S', as seen in Figs. 3 and 4, is arranged vertically over the shaft of the transmission-wheel B and of the disk M. A lever O is fixed at the other extremity of the shaft S', which, of course, has exactly the same lateral motion as the lever N. The lateral motion of the lever O is transmitted to the lever D through the wrist-pin connection t, working in a slot in the lever D. If the disk M is driven in the direction of the arrow, Fig. 3, the lever N will be swung toward the left, and by reason of its roller traveling in the eccentric groove it will be oscillated from the center to the left and back to the center, producing, through rock-shaft S', arm O, and lever D, a corresponding movement in a reverse direction. Should, however, the direction of rotation of the disk M be reversed, the arm N would be carried from the center toward the right and would continue to oscillate from the center toward the right as long as this direction of rotation is maintained, producing the corresponding effect (reversed) upon the paddle. As the direction of the motor can be regulated by ratchet devices, the motion of the paddle-shaft will depend upon these displacements of the motor. If the counter-shaft of the motor turns to the left, the stroke of the paddle-shaft will be to the right, considering the axle of the ship's body.

Fig. 1 shows the mechanism of the lateral motion when disconnected. This steering apparatus can only be connected, of course, when the two levers C D are disconnected. As has been stated, the disk M is connected with the lever N by operating the lever Z. The latter is in connection with the lever x^0, which is fixed upon one of the extremities of the axle y. A second lever x upon the other extremity of said axle carries a pin which engages in a longitudinal slot of the two-armed lever w, and this lever in its turn is connected with a two-part ring v, loose upon the nave of the disk M. The lever w has its pivotal point in two projecting pins of the bearing S, Fig. 3.

The electromotor G bears upon a cast-iron chest F, which ends in a plate at the rear, upon which the two bearings for the shaft E rest. The chest and the bearing-plate are made of one piece and rest upon the cover of the water-tank G', wherein they form the ballast of the vessel. The cover of the water-compartment is reinforced by three angle-irons, which are riveted to the body of the vessel.

P is the rudder, the pivotal shaft of which passes through the angle-iron Q and is guided in a box or casing which serves as a stuffing-box. The pivotal shaft of the rudder is provided at the top with a two-arm lever, which is suitably connected with the steering-wheel.

Figs. 7 and 8 illustrate the paddle by means of which the vessel is propelled. As will be seen, the same consists of thick and thin plates of tempered flexible steel, and is fixed vertically to the vessel's body at a suitable distance from the pivotal shaft of the rudder-rod. By the oscillating striking motions the flexible steel plates work on the water as inclined surfaces and propel the vessel.

For vessels of little depth the paddle should be fixed horizontally with the ship's body and have up-and-down striking motion, in which case the form of the vessel, in a horizontal line, would be flat.

I claim—

1. A propelling mechanism for vessels comprising the oscillating paddle, the vertically-arranged rocking lever connected to said oscillating paddle, the second rocking lever with means for connecting it with and disconnecting it from said first-named lever, the motor and connections to said second lever for oscillating the same, substantially as described.

2. In combination the oscillating paddle, the rocking lever connected therewith, the second rocking lever mounted upon a sliding pivot, means for moving said second lever upon its sliding pivot toward and from the first lever, the motor and connections therefrom to said second lever, substantially as described.

3. In combination with a vessel having a tubular opening in its stern, the vertical shaft, the rod carried by the shaft and extending outward through the opening and terminating in a paddle, the two-armed lever connected rigidly with the shaft, the oscillating lever connected with said two-armed lever, and means for operating said oscillating lever, substantially as described.

4. The combination with the paddle, the oscillating lever connected therewith and the detachable connections for oscillating said lever, of the supplemental oscillating connections comprising the rock-shaft having a

depending arm at one end connected with said oscillating lever, a depending arm at the other end of said shaft, and a cam or eccentric with means for putting it in operative engagement with said second arm, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOSÉ HUBER.

Witnesses:
C. RITCHIE LIMPKINS,
HUGH FINDLAY.