

(No Model.)

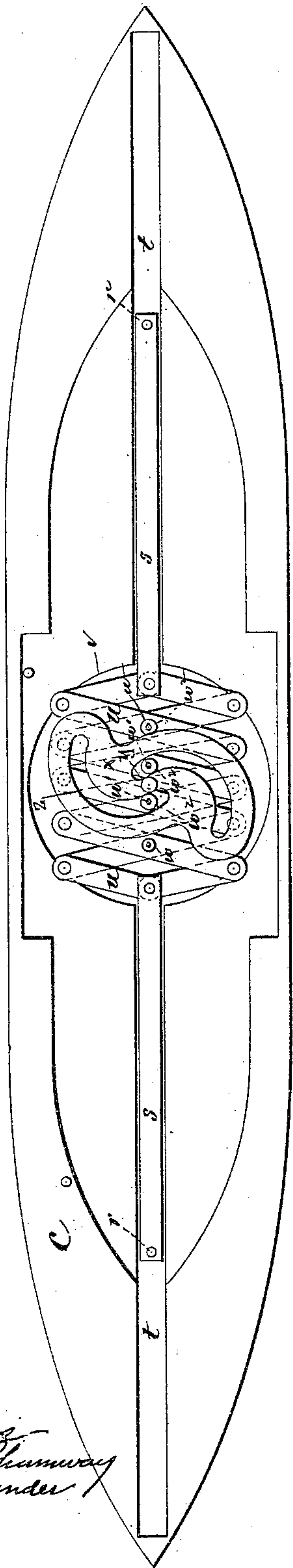
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O. SEEMÜLLER.
PROPELLER.

No. 446,697.

Patented Feb. 17, 1891.

Fig. 1.



Witnesses—
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Seligman Juncker

Fig. 4.

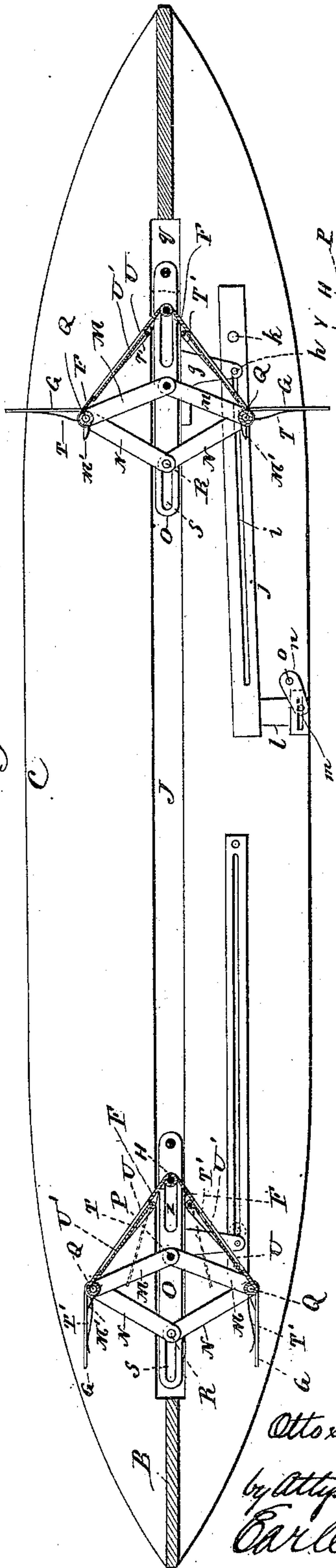
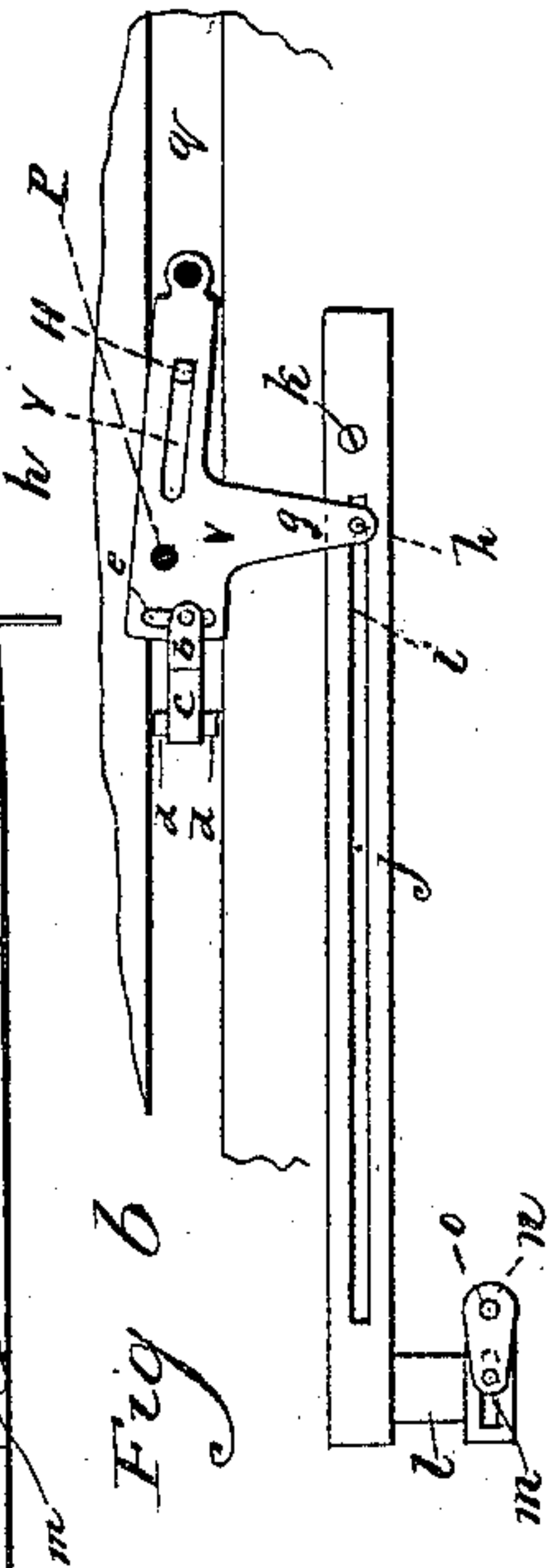


Fig. 6.



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Earle Seligman

(No Model.)

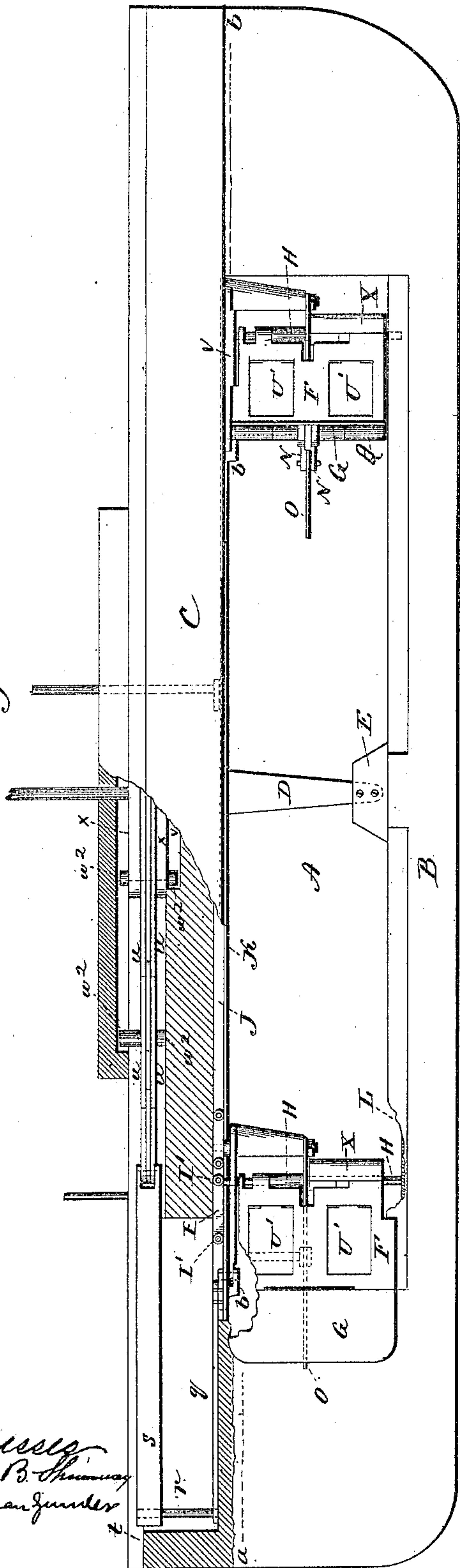
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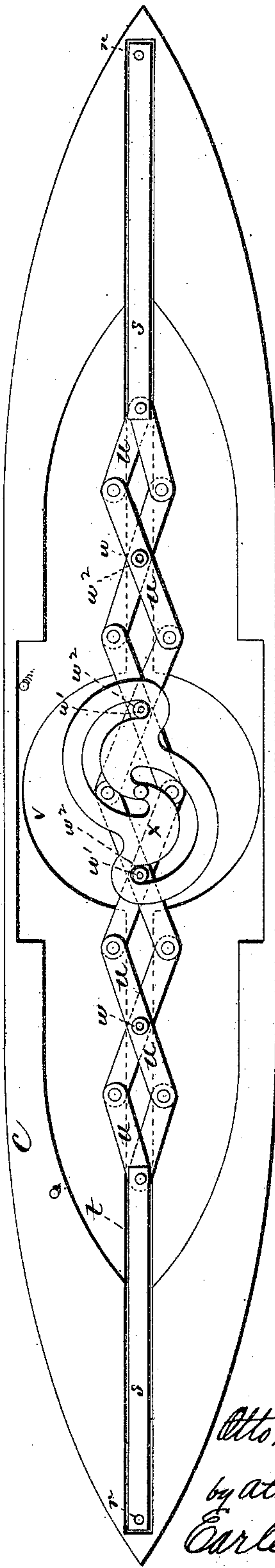
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Fig. 3



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Fig. 2



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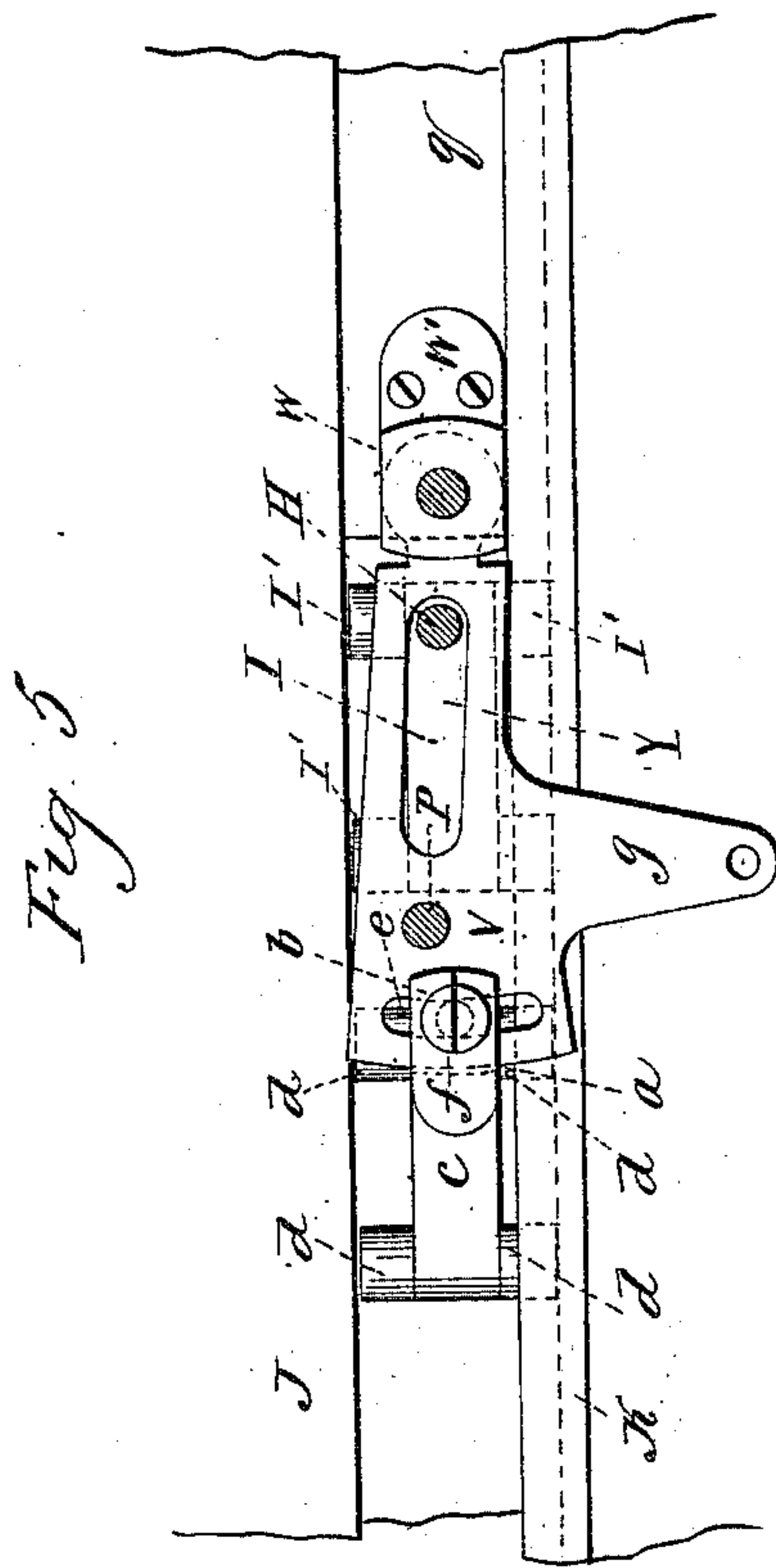
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Fig. 7.

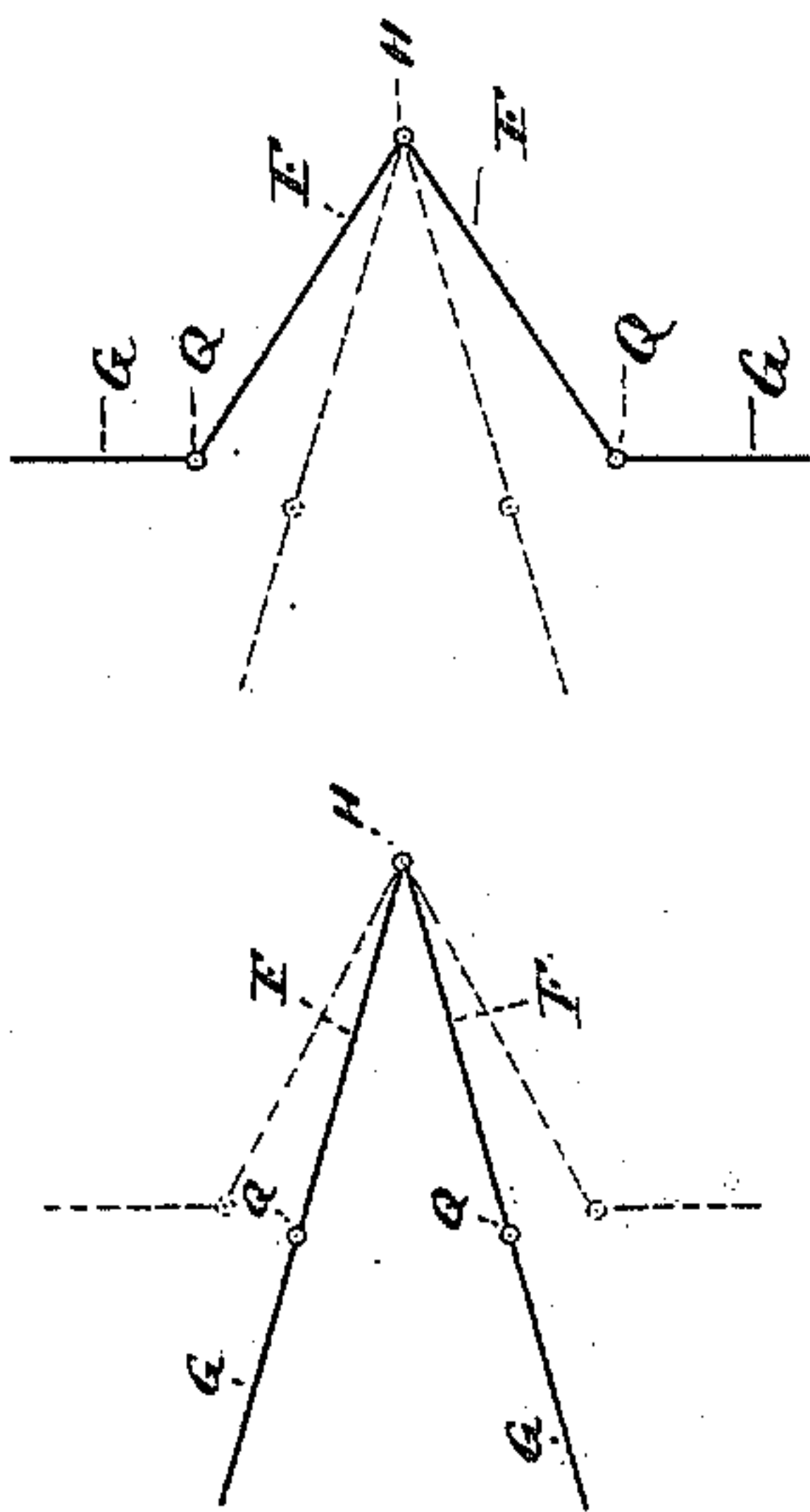
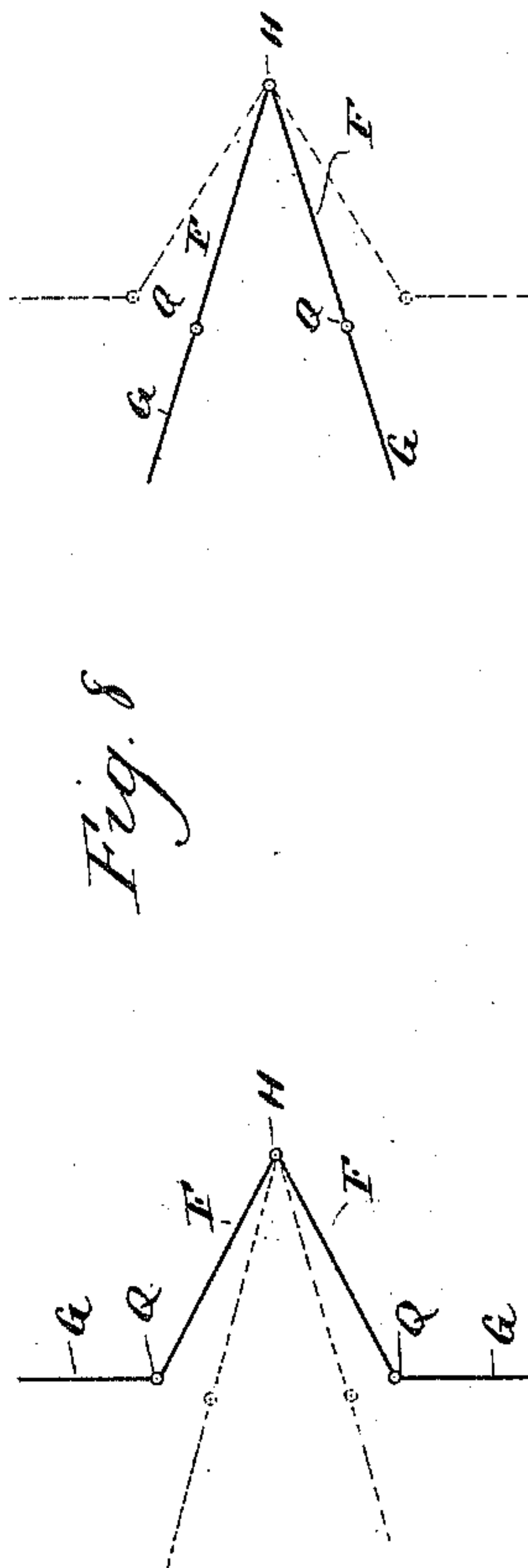


Fig. 8.



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UNITED STATES PATENT OFFICE.

OTTO SEEMÜLLER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO LOUIS W. WIDMANN, OF SAME PLACE.

PROPELLER.

SPECIFICATION forming part of Letters Patent No. 446,697, dated February 17, 1891.

Application filed July 16, 1890. Serial No. 358,961. (No model.)

To all whom it may concern:

Be it known that I, OTTO SEEMÜLLER, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Propelling Vessels; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of a vessel provided with one form which propelling apparatus constructed in accordance with my invention may assume, the said apparatus being shown as ready to begin the outstroke of the paddles; Fig. 2, a similar view, the apparatus being shown as ready to begin the instroke of the paddles; Fig. 3, a view, partly in vertical longitudinal section and partly in side elevation, of the ship and apparatus. Fig. 4 is a reverse plan view of the vessel and apparatus, the keel of the vessel being broken away on the line *a b* of Fig. 3. Fig. 5 is an enlarged reverse plan view showing the stanchion, the steering-plate, and the two carriers of one of the paddles; Fig. 6, a detached reverse plan view of the steering mechanism; Fig. 7, a diagram showing the positions of the paddle-wings during and at the conclusion of the instroke of the paddles, and Fig. 8 is a similar view showing their positions during and at the conclusion of the outstroke.

My invention relates to an improvement in propellers of the reciprocating-paddle class, the object being to provide simple, powerful, and economical means for the propulsion of large or small vessels.

With these ends in view my invention consists in paddles and operating mechanism therefor, having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention the paddles are arranged to simultaneously move toward and away from each other in a long opening A, formed in the keel B of the hull C of the vessel. Two inclined stays D D, attached to the bottom of the hull and secured to a shoulder

E, rising in the said opening from the keel, support the lower edge of the same midway of its length. The paddles are alike in construction, and therefore description of one will suffice for both. Each paddle consists of two hinged wings composed of a forward section F and a rear section G, hinged thereto. The forward sections of the wings are arranged to swing upon an upright movable shaft H, depending from the forward end of a carrier I, provided at its rear and forward ends with a pair of horizontal anti-friction rollers I', located in a groove J, formed in the bottom of the hull and extending nearly throughout the length thereof and supported by ledges K K, extending inwardly toward each other from the opposite lower edges of the said groove. The lower end of the shaft extends into a slot L, formed in the lower wall of the opening in the keel. The forward sections F of the hinged paddle-wings are controlled and braced in their opening and closing action, in which they swing upon the shaft H as a center, by means of two pairs of levers M and N, the former having their inner edges and their ends longitudinally slotted. The forward ends of the levers M fit over the edges of a horizontal bearing-plate O, supported at its rear end by a stay-rod P, which passes through the said ends of the levers and forms a fulcrum therefor.

The rear ends of the levers M are respectively fulcrumed on the pintles Q, on which the outer sections of the paddle-wings are hinged to the inner sections thereof. The forward ends of the levers N are fulcrumed on the said pintles and extend between the slotted rear ends of the levers M, while their rear ends are horizontally slotted to adapt them to fit over the rear end of the bearing-plate O, and vertically perforated to receive a pin R, passing through a slot S, formed in the rear end thereof. By its engagement with the forward and rear end walls of the said slot S the said pin limits the opening and closing action of the forward sections of the paddle-wings.

The rear sections of the paddle-wings are constructed in their hinges so as to reach the limit of their opening action just within a

line extending parallel with the beam-lines of the vessel, whereby when open they secure a powerful purchase on the water. In their closing action they are stopped in the planes of the forward sections by the rear ends of the levers M, which are thereto extended, as at M'.

Springs T, located within the forward sections F of the paddle-wings, exert a constant effort to open them, while corresponding springs T', located between the rear sections G, exert a constant effort to spread them open.

Two large openings U U, located one above the other in the forward wing-sections F, and closed at the rear by valves U' U', are provided for reducing the resistance of the paddles as the same are moved forward through the water, which then presses the valves inward and open and flows through the said openings. The springs T, before mentioned, are arranged, as herein shown, to supplement their primary function of forcing the forward wing-sections F apart by the additional duty of normally closing the valves, which will be held tightly shut by the pressure of the water upon their inner faces when the paddles are moved rearwardly.

The stay-rod P before mentioned is rigidly secured to the rear end of a horizontal steering-plate V, which, with the bearing-plate, bears the draft of the paddle. The forward end of the said plate is pivoted in a slot W, opening rearward, and formed in the upper end of a stanchion W', while the lower end of the bearing-plate is rigidly attached to the lower end thereof. The body of the said stanchion is wedge-shaped in transverse section and tapered longitudinally to form a cleaver to break the water in front of the upper half of the paddle. The same thing is done for the lower half of the paddle by a cleaver X, composed of a sheet of metal, the rear ends whereof are attached to the lower forward edges of the forward wing-sections.

The forward ends of the switching and bearing plates are respectively provided with clearance-slots Y and Z, through which the movable shaft H passes and in which it moves back and forth with the hinged paddle-wings as they are opened and closed, the said movement of the wings resulting from their attachment to the levers M M.

The rear end of the steering-plate is supported and transversely moved in a horizontal slot a, opening forward and formed in a lug b, depending from a carrier c, provided with four anti-friction rollers d, extending laterally into the groove J and running upon the ledges K K, the said carrier moving back and forth in the groove J as the paddle is reciprocated. A segmental slot e, formed in the said end of the carrier, receives a stud f, mounted in the lug b, and permits the plate to be swung in line with the beam of the vessel, and so carry the paddle out of line with the keel, whereby the vessel is swerved one

side or the other for steering. Thereto the plate is provided with a lateral steering-arm g, carrying in its outer end a pin h, entering a slot i, formed in a steering-lever j, fulcrumed adjacent to the paddle on a stud k and provided at its opposite end, which terminates amidships, with a slotted arm l, receiving the pin m of a crank n, carried by a shaft o, mounted in the hull and extending upward and provided with a lever or wheel, neither of which are shown.

As herein shown, the stanchions of the paddles are secured to the inner ends of long horizontal driven slides q, playing in the opposite ends of the groove J and secured at their outer ends to driving-studs r, depending from the outer ends of the driving-slides s s, guided in a long groove t, formed in the hull, and receiving their upper and lower edges. The inner ends of the said driving-slides are connected with the outer levers of a series of levers u, connected together on the plan of lazy-tongs, and expanding and contracting each way from the center of the series in a chamber formed for them in the hull. These levers are connected through pins w w, extending above and below them and forming the central fulcra of the middle levers of the series with two driving-cams x x, separated to receive the levers between them, rigidly secured to an upright reversible driving-shaft y, mounted in the hull, and each provided with two segmental slots z z, curving in opposite directions, and having their adjacent ends arranged to overlap each other. The said cams are arranged so that their corresponding slots align with each other, so as to receive the upper and lower ends of the respective pins which also project sufficiently above and below the cams to enter the groove t, which guides them. The levers are also guided by corresponding pins w' w', entering the said grooves at their upper and lower ends. The said pins w w and w' w' are provided with anti-friction rollers w² to reduce the friction of their action. The driving-shaft is turned half a revolution in opposite directions alternately by manual, steam, or other power appliances. (Not shown.)

Having now described the construction of my improved device, I will proceed to set forth the mode of its operation.

In the first place, attention must be called to the fact that as the levers are simultaneously extended and contracted on opposite sides of the driving-shaft one paddle will be moved forward while the other is moved backward, and vice versa, so that with every rotation of the driving-shaft the vessel will receive a forward impulse from one of the paddles while the other is getting into position to take its effective stroke. When the levers are contracted, as shown by Fig. 1 of the drawings, the paddles come together with their hinged wings in the positions in which they are shown by full lines in the diagram forming Fig. 7. It will thus be seen that on

the instroke of the paddles the forward paddle is opened out so as to push against the water and impel the vessel forward, while the rear paddle is closed so as to move forward through the water with the minimum resistance thereto; but just as soon as the driving-shaft begins its reverse rotation, and the levers begin to be extended, the positions of the wings of the paddle are reversed, as shown by the broken lines in the said diagram and by full lines in the diagram forming Fig. 8. The rear paddle, now full open, moves backward and pushes against the water to give the vessel its forward impulse, while the forward paddle moves forward through the water with its wings closed. Then after the limit of the outstroke has been reached, as shown by Fig. 8, and the instroke begun, the wings resume the position shown by the broken lines of the said figure and by the full lines in the preceding figure, and so on. It will thus be seen that the paddles are alternately moved forward and back and their wings alternately opened and closed.

If desired, more than two paddles may be used and the means shown for driving them replaced by any other mechanism suitable to the purpose. It is also apparent that other changes in the details of the construction of the paddles and their operating mechanism may be made. I would therefore have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. The combination, with two or more paddles, each having two wings hinged at their forward ends to an upright shaft common to them both, of means for simultaneously moving them toward and away from each other, substantially as described.

2. The combination, with two or more paddles having hinged wings and a steering-plate, means for simultaneously moving them toward and away from each other, and connections with their steering-plates, whereby they may be shifted transversely for steering, substantially as described.

3. The combination, with a vessel having a long longitudinal opening formed in its keel, of two or more paddles located in the said opening and each having two wings hinged at their forward ends to an upright shaft common to them both, and means attached to the paddles for simultaneously moving them toward and away from each other in the said opening, their wings being alternately opened and closed, substantially as described.

4. The combination, with a vessel having a long longitudinal opening formed in its keel, of two paddles located in the said opening and each having two wings hinged at their forward ends to an upright shaft common to

them both, mechanism mounted in the hull of the vessel and including a slide for each paddle, and a reversible shaft with which the slides are connected for simultaneously moving the paddles toward and away from each other, substantially as described.

5. The combination, with a vessel having a long longitudinal opening formed in its keel, of two paddles located in the said opening, slides connected with the said paddles, levers arranged on the plan of lazy-tongs connected with the slides, cams located centrally to the said levers and connected with them so as to simultaneously extend and contract them on each side of them, and a reversible shaft for operating the cams, substantially as described.

6. The combination, with a vessel having a long longitudinal opening formed in its keel, of two paddles located in the said opening, two driven slides mounted in the hull of the vessel and having the respective paddles connected with their inner ends, two driving-slides having their outer ends connected with the corresponding ends of the driven slides, a series of levers arranged on the plan of lazy-tongs and having their opposite ends connected with the inner ends of the driving-slides, cams having segmental slots located centrally to the series of levers and connected with the same by fulcrum pins thereof, and a reversible shaft for operating the cams, substantially as described.

7. In a paddle, the combination, with two hinged wings, each composed of a forward and a rear section, the former being hinged to an upright shaft common to them both and the latter diverging from each other, of means for limiting the opening and closing action of the said sections, and springs arranged to exert a constant tendency to force the wings into their open positions, substantially as described.

8. In a paddle, the combination, with two hinged wings, each composed of a forward and a rear section, the former being hinged to an upright shaft common to them both and the latter diverging from each other, of horizontal levers located between and uniting the forward sections of the wings, and a horizontal bearing-plate located between the wings for supporting the levers, substantially as described.

9. The combination, with two or more paddles, each consisting of two hinged wings, each wing composed of a forward and a rear section, the forward section of the wings being hinged to an upright shaft common to them both and their rear sections being diverged from each other, of an upright stanchion, a horizontal steering-plate and a horizontal bearing-plate for each paddle, the said plates being pivoted at their forward ends to the stanchion and provided with slots to receive the said upright shaft, means connected with the steering-plate for shifting it in a horizontal plane, and operating mechanism

carrying the stanchions and constructed to move the paddles simultaneously toward and away from each other, substantially as described.

- 5 10. The combination, with operating mechanism, of a vertical stanchion connected therewith, horizontal slotted steering and bearing plates respectively connected to the upper and lower ends of the stanchion, a movable
10 shaft extending through the slots in the said plates, a reciprocable carrier for the said shaft, two paddle-wings hinged to the said shaft at their forward ends, a stay-rod connecting the steering and bearing plates, le-
15 vers combined with the bearing-plate, stay-rod for limiting the opening and closing action of

the forward sections of the wings, and a carrier for the outer end of the steering-plate which is transversely movable, substantially as described.

- 20 11. The combination, with two hinged paddle-wings, of a steering-plate with which they are connected, provided with a lateral arm, and a series of levers connecting the said arm with a steering-shaft, whereby the plate
25 is moved transversely to the normal path of the paddle-wings which are secured with it, substantially as described.

OTTO SEEMÜLLER.

Witnesses:

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