C. MELDAU.

HYDROPLANE MOTOR BOAT.

APPLICATION FILED JAN. 27, 1909.

976,588.

Patented Nov. 22, 1910.

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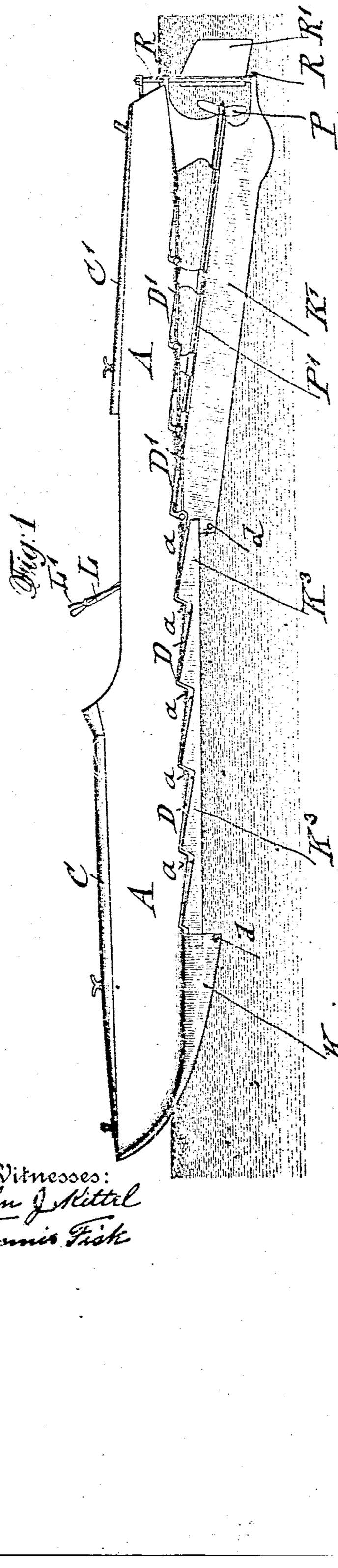


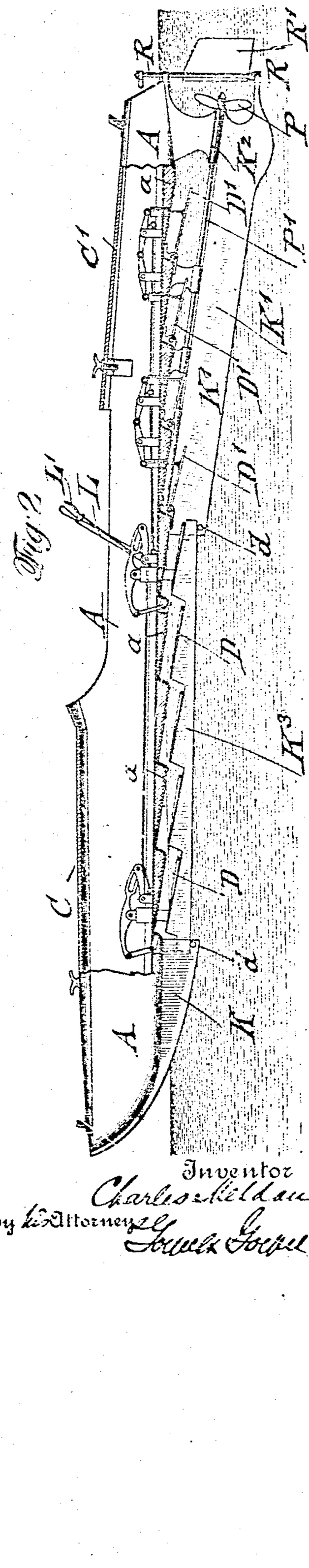


Witnesses:
John J. Kittel
Francis Fisk

Inventor
Charles Meldau
By his Attorneys
Lowell & Lowell

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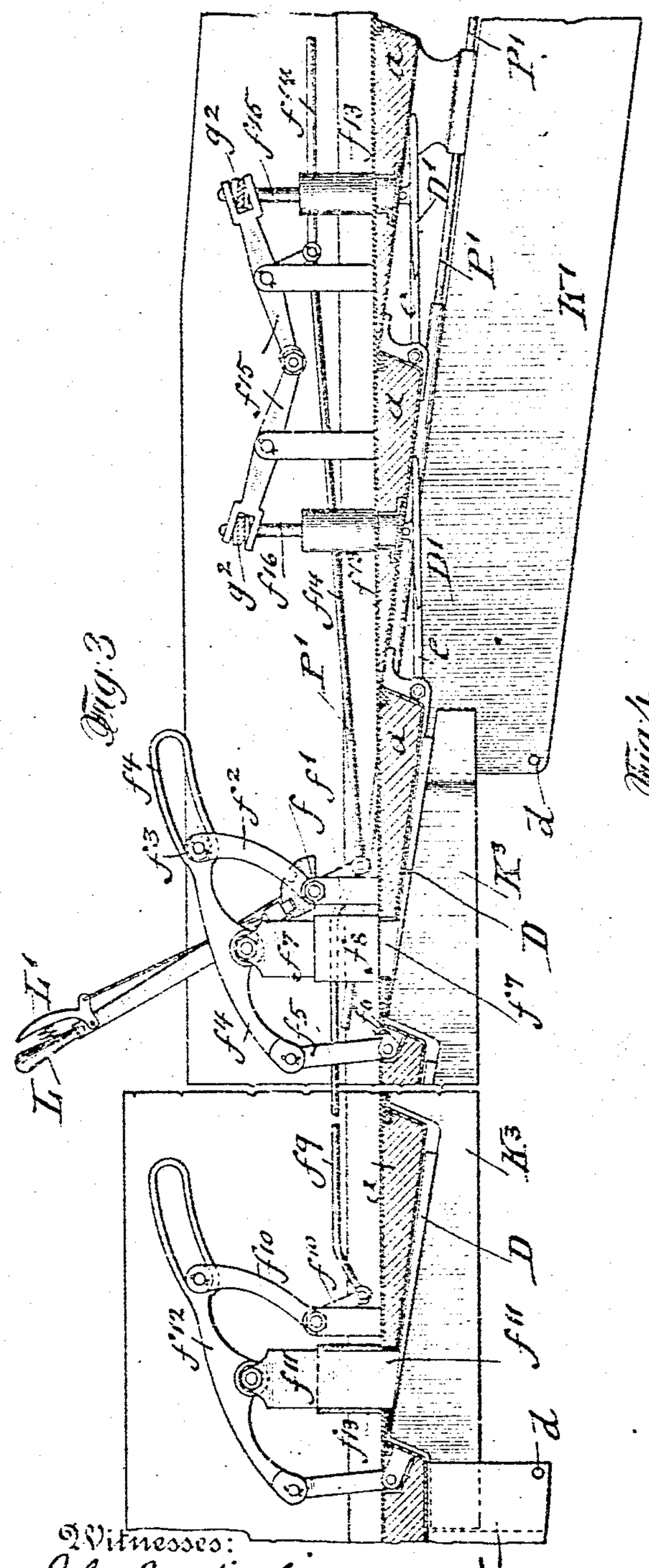
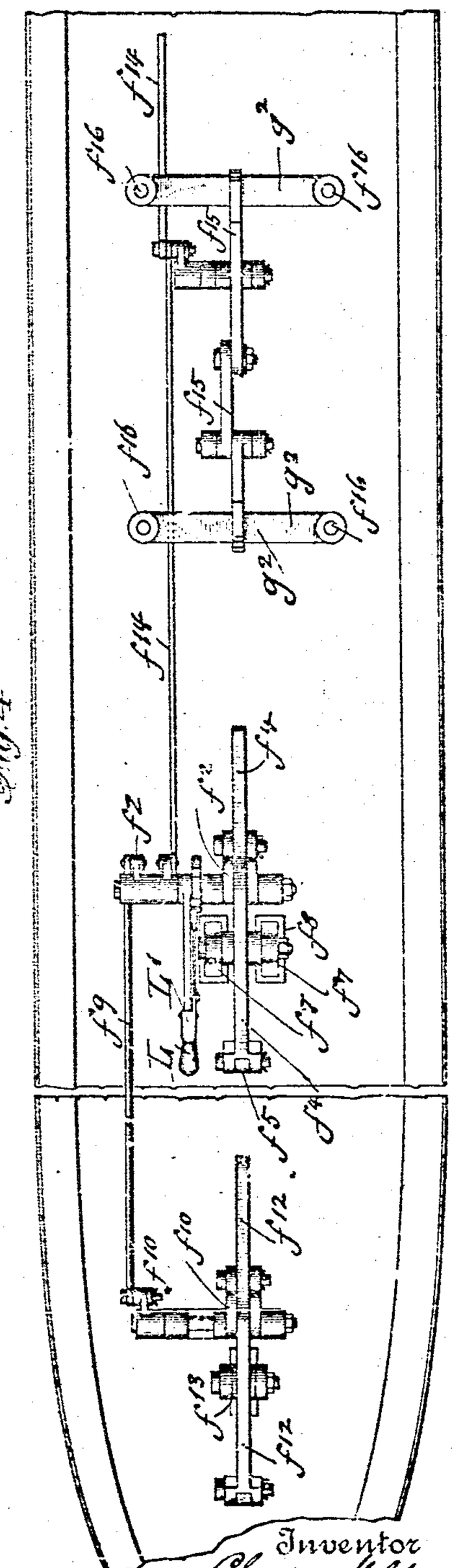
3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

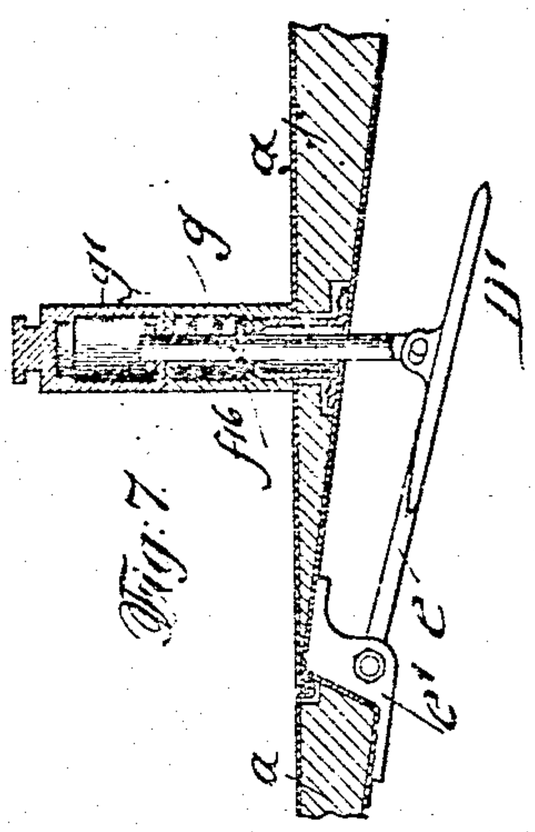

Fig. 7.

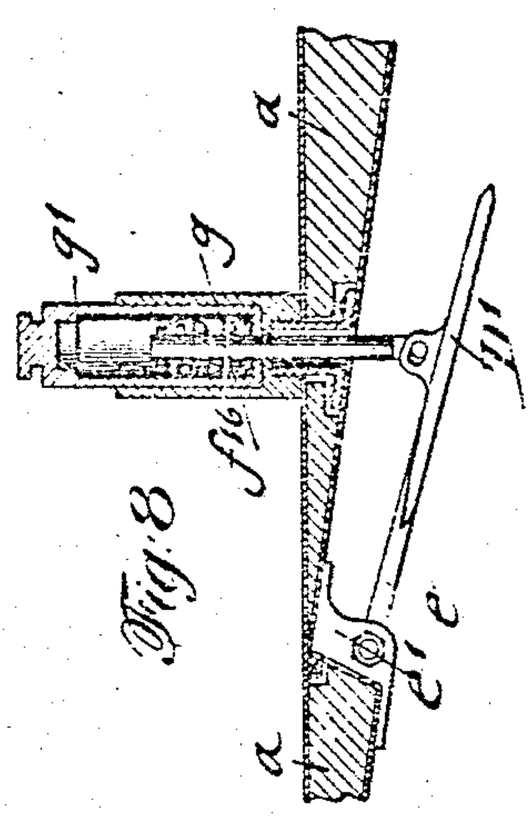

Fig. 8.

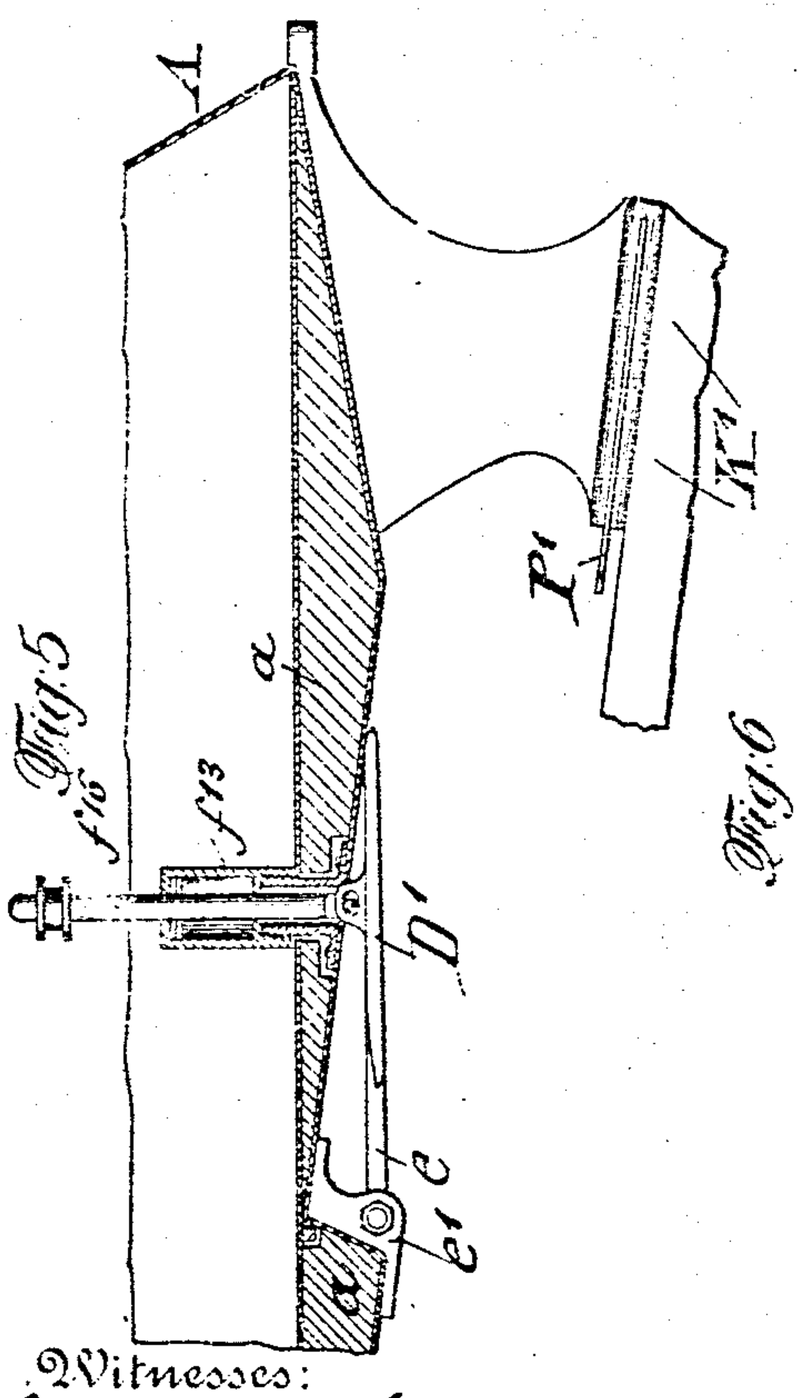

Fig. 5.

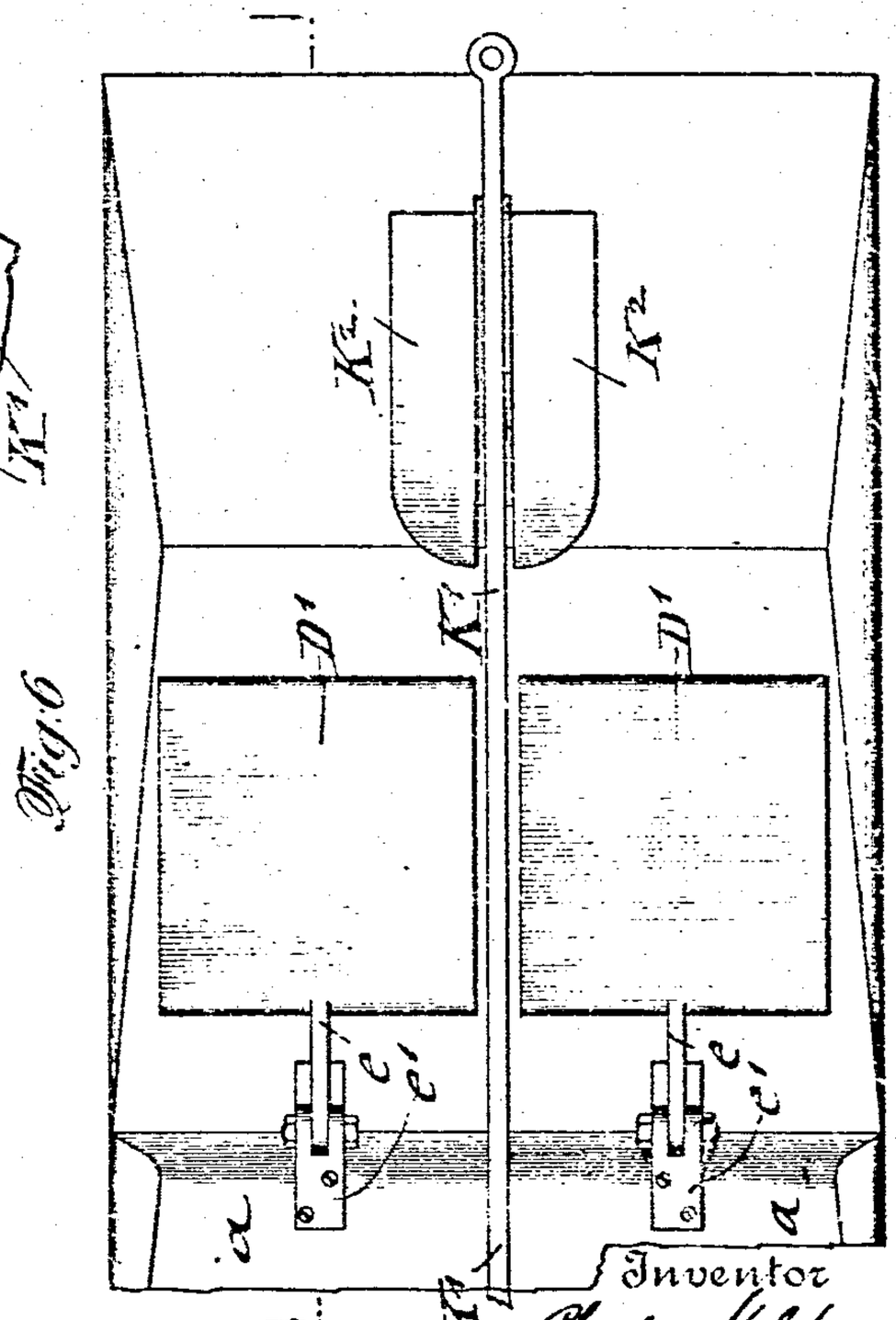

Fig. 6.

Witnesses:
John J. Kittel
Francis Fisk.

Inventor
Charles Meldau
By his Attorneys
Howson & Howson

# UNITED STATES PATENT OFFICE.

CHARLES MELDAU, OF NEW YORK, N. Y.

## HYDROPLANE MOTOR-BOAT.

976,588. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed January 27, 1909. Serial No. 474,545.

*To all whom it may concern:*

Be it known that I, CHARLES MELDAU, a citizen of the United States of America, residing in New York, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Hydroplane Motor-Boats, of which the following is a specification.

This invention relates to certain improvements in motor-boats, and more especially to that type of motor boats known as hydroplane motor-boats, in which a plurality of hydroplanes can be moved to some distance below the bottom of the motor-boat whenever the latter is to be moved at greater speed, but which hydroplanes can at any moment be returned into close proximity to the bottom of the boat for reducing speed, for avoiding obstructions or in shallow water; and for this purpose the invention consists of a motor-boat provided with a plurality of hydroplanes below the bottom, which are applied to a movable keel between a stationary bow-keel and stern-keel and raised or lowered by a lever-mechanism in the boat connected with the different hydroplanes arranged below the same.

The invention consists further of certain details of construction which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved hydroplane motor-boat, showing the hydroplanes arranged in normal position close to the bottom of the boat, Fig. 2 is a vertical longitudinal section, showing the hydroplanes in lowered position for driving the motor-boat at increased speed through the water, Fig. 3 is a vertical longitudinal section through the motor-boat, showing the lever-mechanism for controlling the hydroplanes below the bottom of the boat, Fig. 4 is a plan-view of Fig. 3, Figs. 5 and 6 are respectively a detail vertical section and bottom-view of one of the stern-hydroplanes and of the mechanism for raising or lowering the same, and Figs. 7 and 8 are detail vertical sections, showing modified constructions of the raising and lowering mechanism of the hydroplanes.

Similar letters of reference indicate corresponding parts throughout the different figures.

Referring to the drawings, A represents a motor-boat of the usual approved construction, which is provided with protecting covers or shields C $C^1$ at the bow and stern of the boat. The bottom of the motor-boat is provided with inclined steps *a* which extend from a point near the bow to the stern of the boat, the steps being formed of tapering wooden filling-pieces and sheet-metal coverings, as shown in Figs. 1 and 2. A stationary keel K extends along the bow, and a second stationary keel $K^1$ from some point about midway of the hull to the stern, the keel $K^1$ increasing in depth so as to act in the nature of a center-board for keeping the motor-boat steady when the same is driven through the water. The stern-keel $K^1$ is provided at both sides with fixed horizontal planes $K^2$, for neutralizing the downward pressure of the propeller, said planes also assisting in holding the boat steadily in the water. A rudder-post R is supported in bracket-bearings at the rear-ends of the stern and stern-keel $K^1$, the propeller P turning in the space between the rear-end of the stern-keel and the rudder $R^1$. The propeller-shaft $P^1$ extends in inclined direction through the bottom of the motor-boat to the interior of the same, and turns in suitable thrust-bearings in the bottom of the boat, it being connected with and driven by the engine located in the front-part of the boat in the usual manner. The rear-end of the bow-keel K is provided with a vertical groove for guiding the front-end of a movable keel $K^3$ which is guided by its grooved or forked rear-end on the front-end of the stern-keel $K^1$; the inner end of the bow-keel K and the front end of the stern-keel $K^1$ being provided with transverse stop-pins *d* by which the downward motion of the movable keel $K^3$ is limited. The movable keel $K^3$ is made step-shaped at its upper edge corresponding to the steps at the bottom of the boat A, and provided with hydroplanes D which are arranged at an oblique angle to the movable keel $K^3$, but parallel with the inclined surfaces of the steps *a* at the bottom of the boat. The metallic covering of the steps *a* is connected with the coverings of the adjacent steps by means of bent-over interlocking ends which are riveted together, as shown in detail in Figs. 5, 7 and 8. In the space between the upper edge of the stern-keel and the bottom of the boat are arranged a number of hydroplanes $D^1$,

which extend across the full width of the bottom of the boat and which are provided with forwardly-extending shanks or arms *e* that are pivoted to brackets $e^1$ attached to the bottom of the boat, as shown in detail in Figs. 5–8. The hydroplanes D on the keel $K^3$ and the separate hydroplanes $D^1$ above the stern-keel are operated simultaneously by a suitable lever-mechanism from a hand-lever L which is located in the center of the boat, said lever being provided with a safety-catch formed by a pawl which engages a notched segment on the lever L, and which is operated by an auxiliary handle $L^1$ adjacent to the handle of the lever L, said auxiliary handle being connected by a rod with the pawl, as shown in Fig. 3. When the handle of the lever L is grasped by the hand, the auxiliary handle is also taken hold of and the pawl released from the notched disk so that the lever can be operated. The main-lever L, the auxiliary lever-handle $L^1$ and the locking mechanism for the same are well known and form a safety-device for preventing the accidental release of the lever L. The lever L is mounted on a rock-shaft *f* that turns in bearings $f^1$ at the bottom of the boat, the rock-shaft being provided with a fulcrumed crank-arm $f^2$ that is connected at its upper end by an anti-friction roller $f^3$ with a loop-shaped lever $f^4$, the opposite end of which is connected by a pivot-link $f^5$ with a stationary arm $f^6$ on the bottom of the boat. The center of the lever $f^4$ is pivoted to the upper end of a guide-rod or bar $f^7$ which passes through a guide-sleeve $f^8$ that is attached to the bottom of the boat and connected with the rear-end of the movable keel $K^3$ carrying the hydroplanes D. The lower end of the fulcrum crank-arm $f^2$ is further connected by a connecting rod $f^9$ extending in forward direction with a second crank-arm $f^{10}$ near the bow of the boat, which crank-arm is also connected by a looped lever $f^{12}$ with a pivoted guide-rod $f^{11}$ that passes through a guide-box $f^{13}$ in the bow of the boat and is connected with the front-end of the movable keel $K^3$, so that the hydroplanes D, together with their keel, can be simultaneously lowered by the operation of the lever L, $L^1$ to a certain distance below the step-shaped bottom of the boat, as shown in Fig. 2. The hydroplanes $D^1$ that are located above the stern-keel $K^1$, are likewise operated by connecting rods $f^{14}$ from the lever L, said connecting rods actuating the hydroplanes $D^1$ by intermediate levers $f^{15}$ and guide-rods $f^{16}$ that are connected with the hydroplanes $D^1$, as shown in Figs. 3, 5 and 6. The guide-rods $f^{16}$ pass through guide-sleeves and stuffing-boxes in the bottom of the boat F and are pivoted to the hydroplanes $D^1$, as shown in Fig. 5. The guide-rods $f^{16}$ of the stern-hydroplanes $D^1$ may be spring-cushioned by interposing helical springs *g* between the guide-rods and movable guide-boxes $g^1$, as shown in Figs. 7 and 8, or in any other approved manner. The upper ends of the movable guide-boxes of the stern-hydroplanes are connected by transverse bars $g^2$ which are raised or lowered by the fulcrum levers $f^{15}$ and connecting rods $f^{14}$ from the main-lever L, as shown in Fig. 4. The spring-cushioned stern-hydroplanes can yield independently in case they are struck by some obstruction, or all the hydroplanes may all be raised simultaneously to avoid being injured by an approaching obstruction, or when in shallow water.

The individual stern-hydroplanes may be connected by two longitudinal keels, one on each side of the central longitudinal axis of the boat, or all the hydroplanes may be made independently movable without using a keel, but for the sake of stability and strength a movable keel for the bow-hydroplanes is preferred. Further, all the guide-rods for the hydroplanes may be spring-cushioned, if desired, or arranged without springs, when simplicity of construction is desired. Any suitable lever-mechanism for operating the hydroplanes may be used, so as not to confine the invention to the construction shown.

The improved hydroplane motor-boat has two speeds: one as an ordinary motor-boat, in which case the intermediate and stern hydroplanes are placed in close proximity to the bottom of the boat; and the second, an increased speed, when all the hydroplanes are lowered. The lowering of all the hydroplanes is produced simultaneously by the actuation of the main-lever L, which by its connection with the intermediate hydroplanes D and the stern-hydroplanes $D^1$ operates all at the same time so as to form a second bottom, so to say, formed of the hydroplanes below the bottom of the boat, whereby they are all placed in inclined working position in the water, as shown in Fig. 2. When the hydroplanes are lowered a much greater speed is obtained as they cut at a certain inclination through the water, whereby the bow of the boat is raised above the water, so as to glide over the water, eliminating thereby the friction of the boat with the water, and creating an air-space between the bottom and the hydroplanes whereby the suction effect on the fast-running boat is eliminated.

When the boat is moving through the water with the hydroplanes in lowered position, the speed can be instantly reduced in case an obstacle is floating in the path of the boat, by reversing the lever and raising thereby all the hydroplanes so as to hug the bottom of the boat. When the danger of collision with an obstacle is past, all the

hydroplanes are again lowered by returning them, by means of the lever into lowered position to the required distance from the bottom of the boat.

The hydroplane-attachment may be applied to any ordinary motor-boat provided the hydroplanes are made to fit closely to the bottom of the boat. The connection of the intermediate hydroplane-keel with the rear-end of the bow-keel and the front-end of the stern-keel, serves to keep the movable keel with its hydroplanes rigidly in position and prevent any lateral motion of the same. The hydroplanes on the movable keel and the stern-hydroplanes, being set at an oblique angle to the surface of the water, are lowered when full speed is applied, so as to glide over the surface of the water and force the bow by the impulse imparted to the boat entirely out of the water so that air spaces are obtained between the bottom of the boat and the hydroplanes, whereby power is gained by reducing the resistance of the boat with the water. For doubling the speed of an ordinary motor-boat, it requires about eight times the power required for the ordinary speed; while with my improved hydroplane-attachment, it requires only the doubling of the power to double the speed.

The depth of the bow-keel and of the stern-keel increases gradually to such a depth that when the intermediate hydroplanes are lowered, the movable keel forms with the bow and stern-keels one continuous line of gradually increasing depth. This gradually increasing depth of the keels imparts great stability to the boat when running at full speed, while at the same time the greater depth of the stern-keel adds greatly to the steadiness of the boat as it acts on the nature of a center-board.

It is obvious that the lever-mechanism for lowering or raising the hydroplanes may be actuated by hand, or in larger boats, by electric, hydraulic or other power.

The hydroplanes, instead of being of flat, straight shape, may be corrugated, upwardly curved, angular, convex or concave, or of any other shape, or two or more sets of hydroplanes, one below the other, may be arranged, all of which are modifications of hydroplanes and within the scope of this invention.

The hydroplanes are not only applicable to motor-boats for sporting purposes, but also for steamboats of larger size, and even to sailing vessels whenever an increase of speed over the ordinary speed is desired.

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

1. A motor-boat having a bottom provided with a series of steps each having an abrupt face, inclined and movable hydroplanes below said steps, and means for lowering said hydroplanes below said steps or raising them into close proximity each with the corresponding step and the abrupt face of the preceding step.

2. A motor-boat provided with a bow-keel increasing gradually in depth, a stern-keel also increasing gradually in depth, an intermediate keel between the bow and stern keels, hydroplanes supported on said intermediate keel, and lever-mechanism for lowering or raising the intermediate keel and hydroplanes on the same.

3. A motor-boat provided with a bow-keel increasing gradually in depth, a stern-keel also increasing gradually in depth, an intermediate keel guided on the bow and stern-keels, hydroplanes supported on said intermediate keel, a number of independently-movable hydroplanes located above the stern-keel, and lever-mechanism for raising and lowering simultaneously the intermediate and stern hydroplanes.

4. A motor-boat provided with a stationary bow-keel, a stationary stern-keel, both gradually increasing in depth, and a movable hydroplane-keel guided on the ends of the bow and stern keels, and hydroplanes on said intermediate keel.

5. A motor-boat provided with a stern-keel of gradually-increasing depth, the upper edge of the stern-keel being at some distance below the bottom of the boat, and a number of independent hydroplanes located in said space and extending transversely below the bottom of the boat, and lever-mechanism for simultaneously lowering or raising said hydroplanes.

6. A motor-boat provided with a stern-keel of increasing depth, the upper edge of the stern-keel being at some distance below the bottom of the boat, a number of independent hydroplanes located in said space and extending transver-ely below the bottom of the boat, cushioning means for the hydroplanes, and means for lowering or raising said independent hydroplanes.

7. A motor-boat provided with a stern-keel of gradually increasing depth, said stern-keel forming a space between its upper edge and the bottom of the boat, a number of independent hydroplanes, each pivoted to the under-side of the boat, spring-cushioned guide-rods connected with said hydroplanes, guide-boxes for the guide-rods, and lever-mechanism connected with the guide-rods for simultaneously lowering or raising said hydroplanes.

8. A motor-boat provided with a stern-keel of gradually-increasing depth, said stern-keel forming an open space between its upper-edge and the bottom of the boat, the boat hydroplanes pivoted to the bottom of the boat, guide-boxes passing through the bottom of the boat, guide-rods pivoted to

the hydroplanes and passing through the guide-boxes to the inside of the boat, and a lever-mechanism connected with all the guide-rods and adapted to lower the hydroplanes below the bottom of the boat or raise them into close proximity to the same.

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

CHARLES MELDAU.

Witnesses:
PAUL GOEPEL,
ERNEST T. F. LOHMANN.