

No. 641,321.

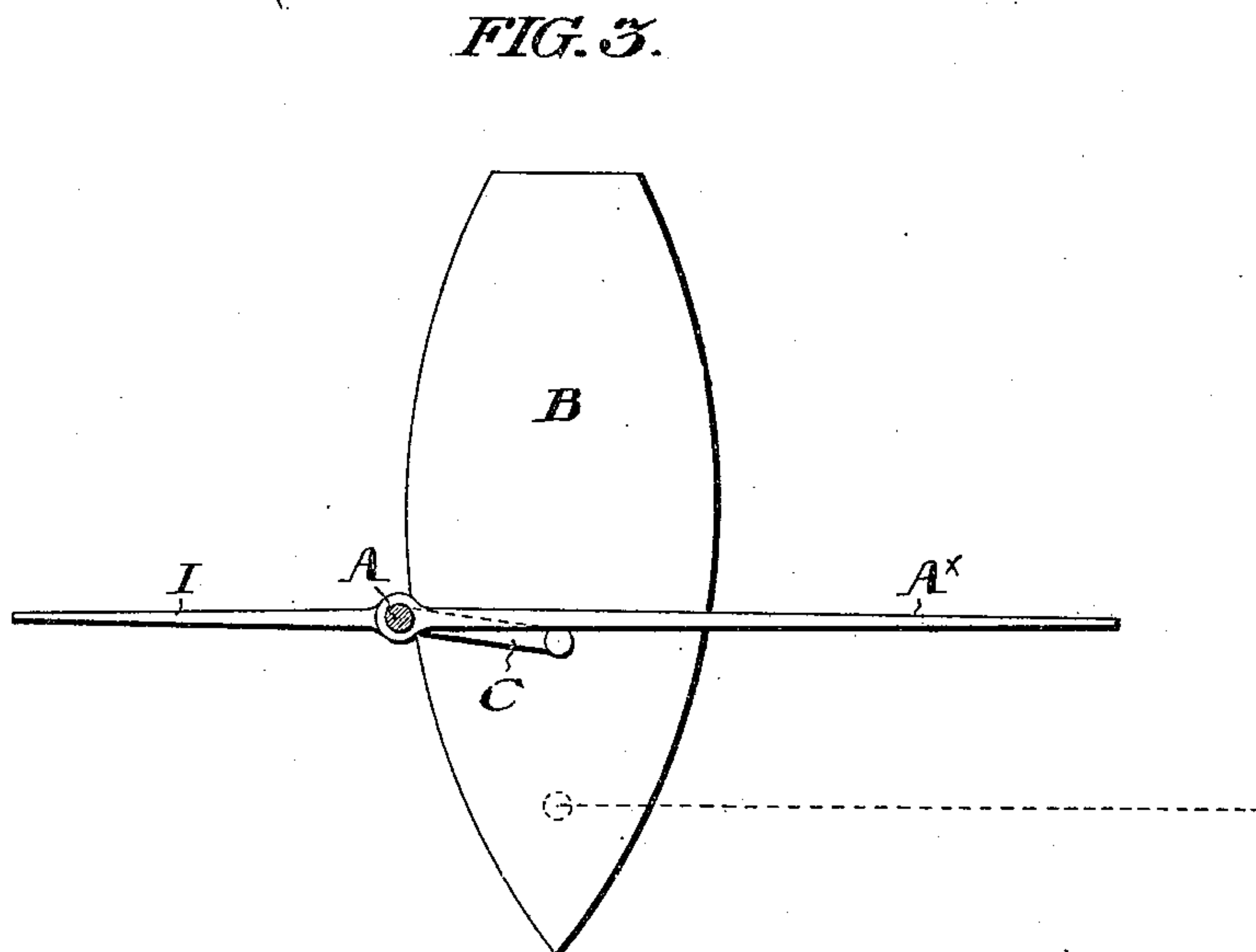
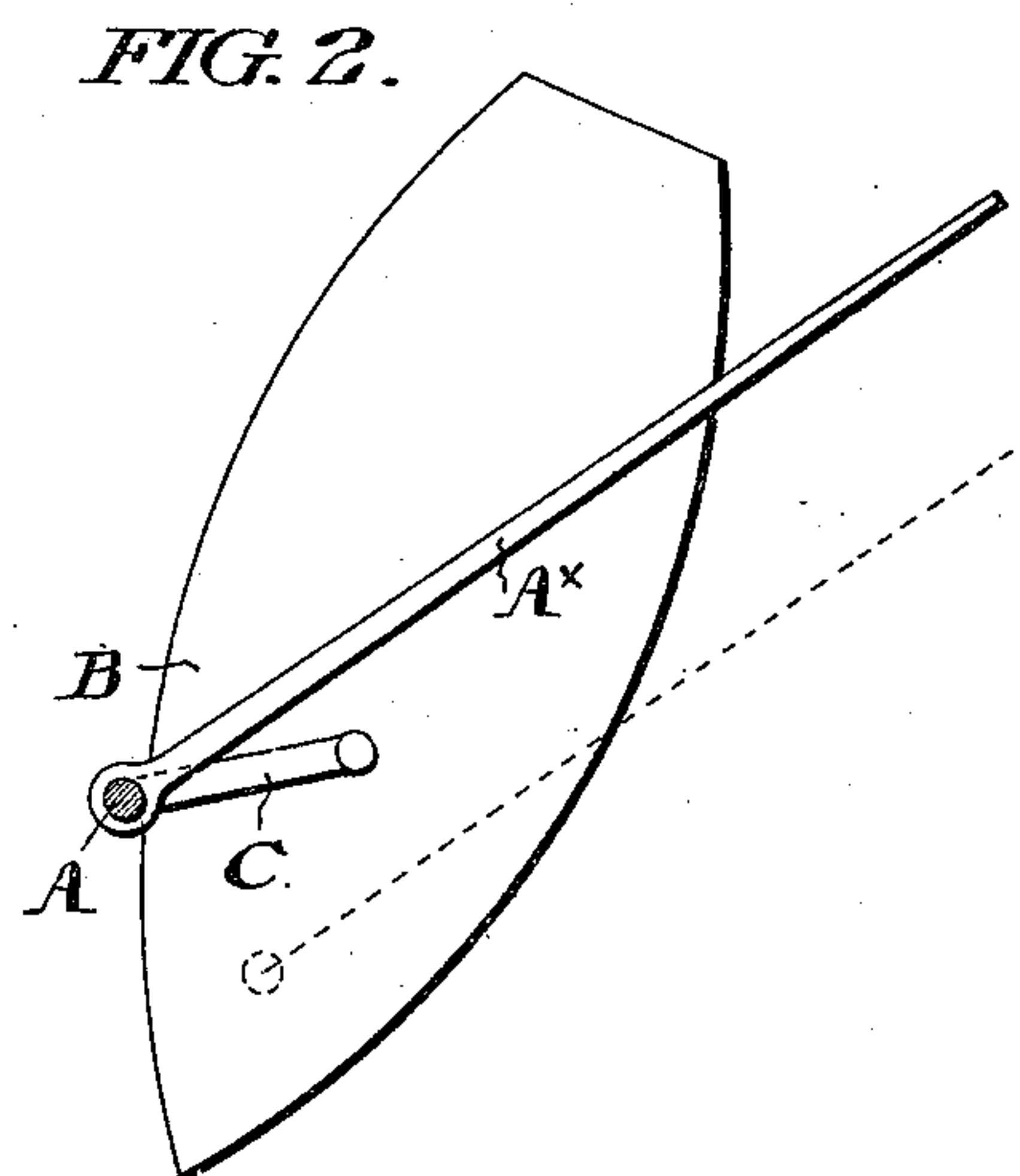
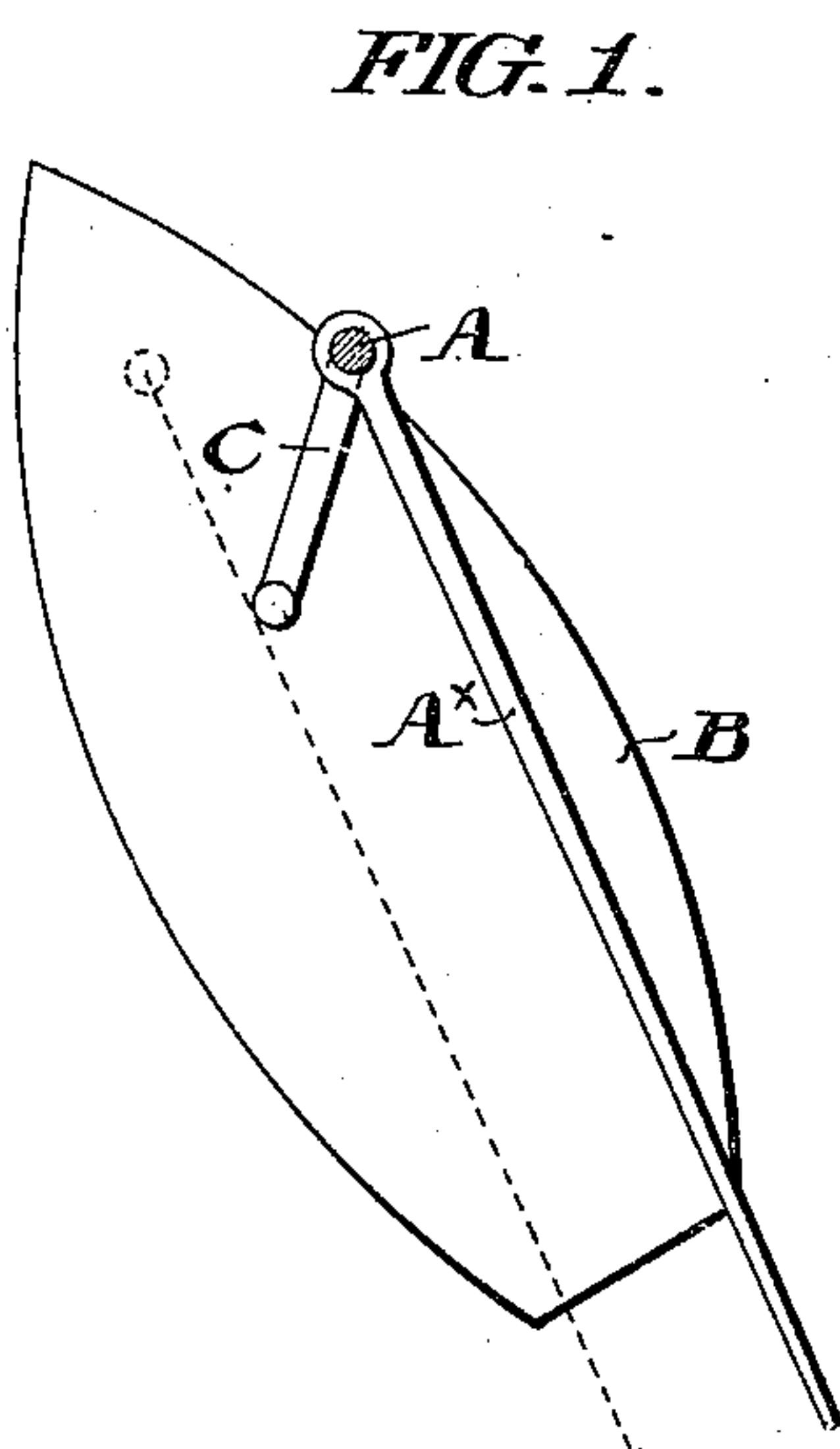
Patented Jan. 16, 1900.

G. H. PERKINS.
SAILING VESSEL.

(Application filed Nov. 10, 1898.)

(No Model.)

3 Sheets—Sheet 1.



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3 Sheets—Sheet 2.

FIG. 4.

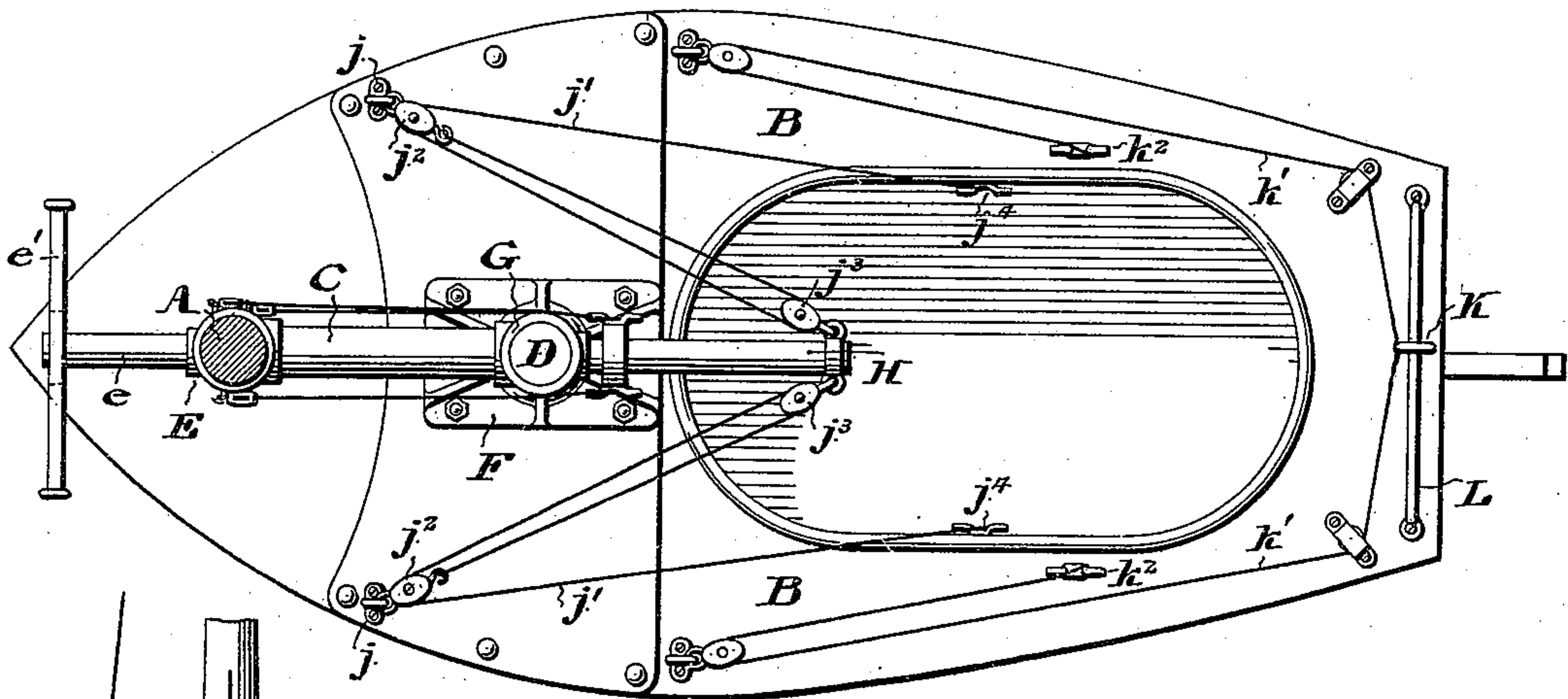
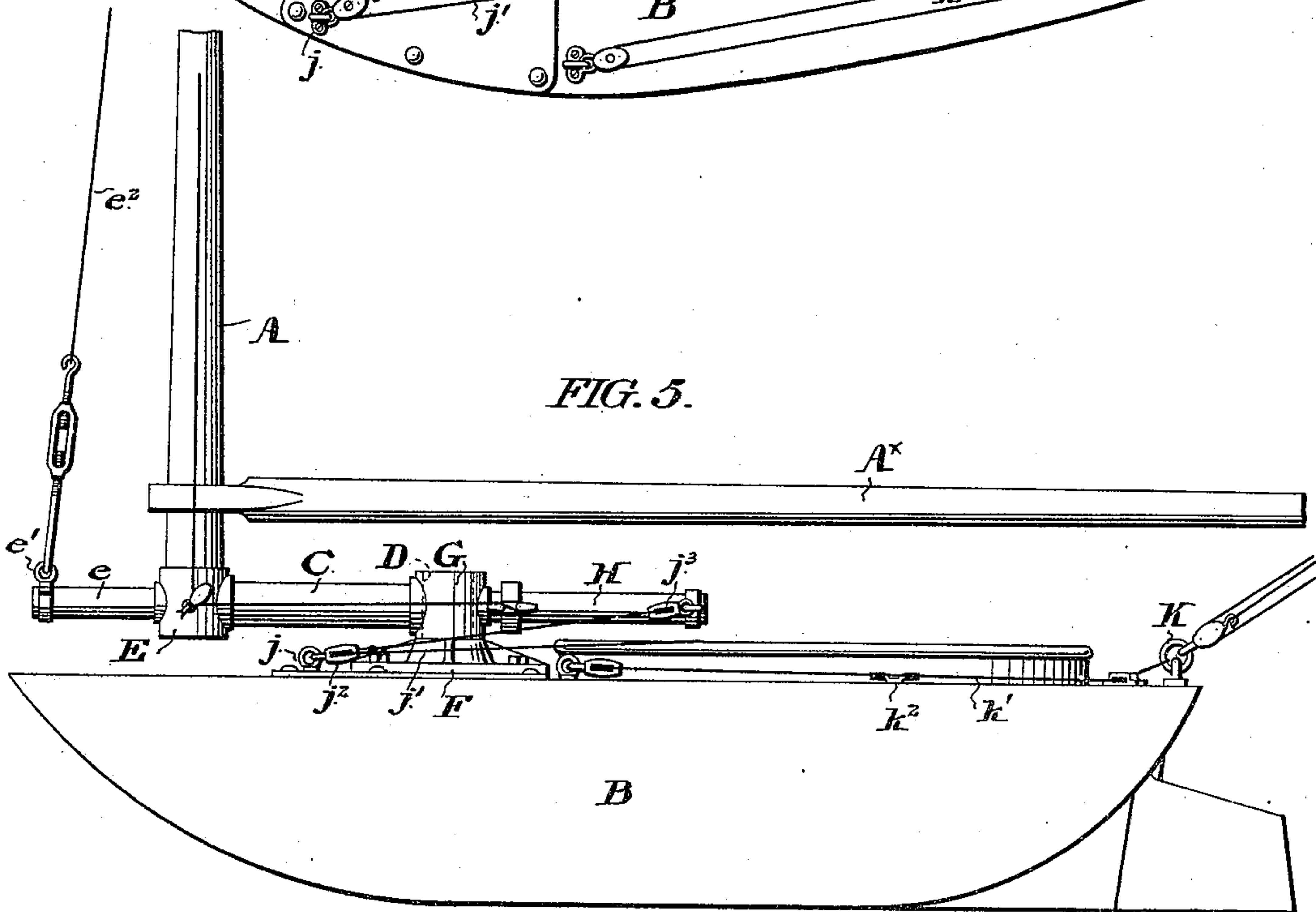


FIG. 5.



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3 Sheets—Sheet 3.

FIG. 6.

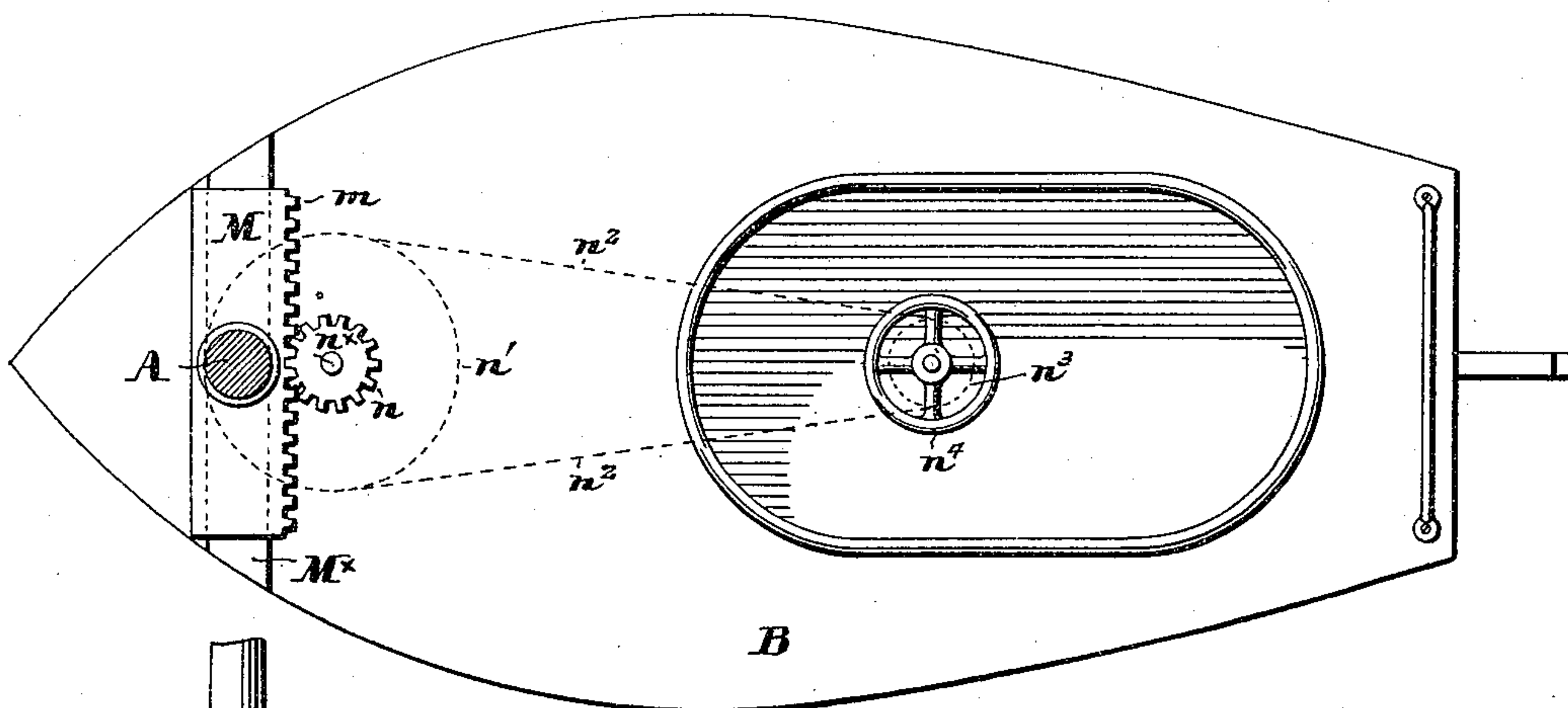
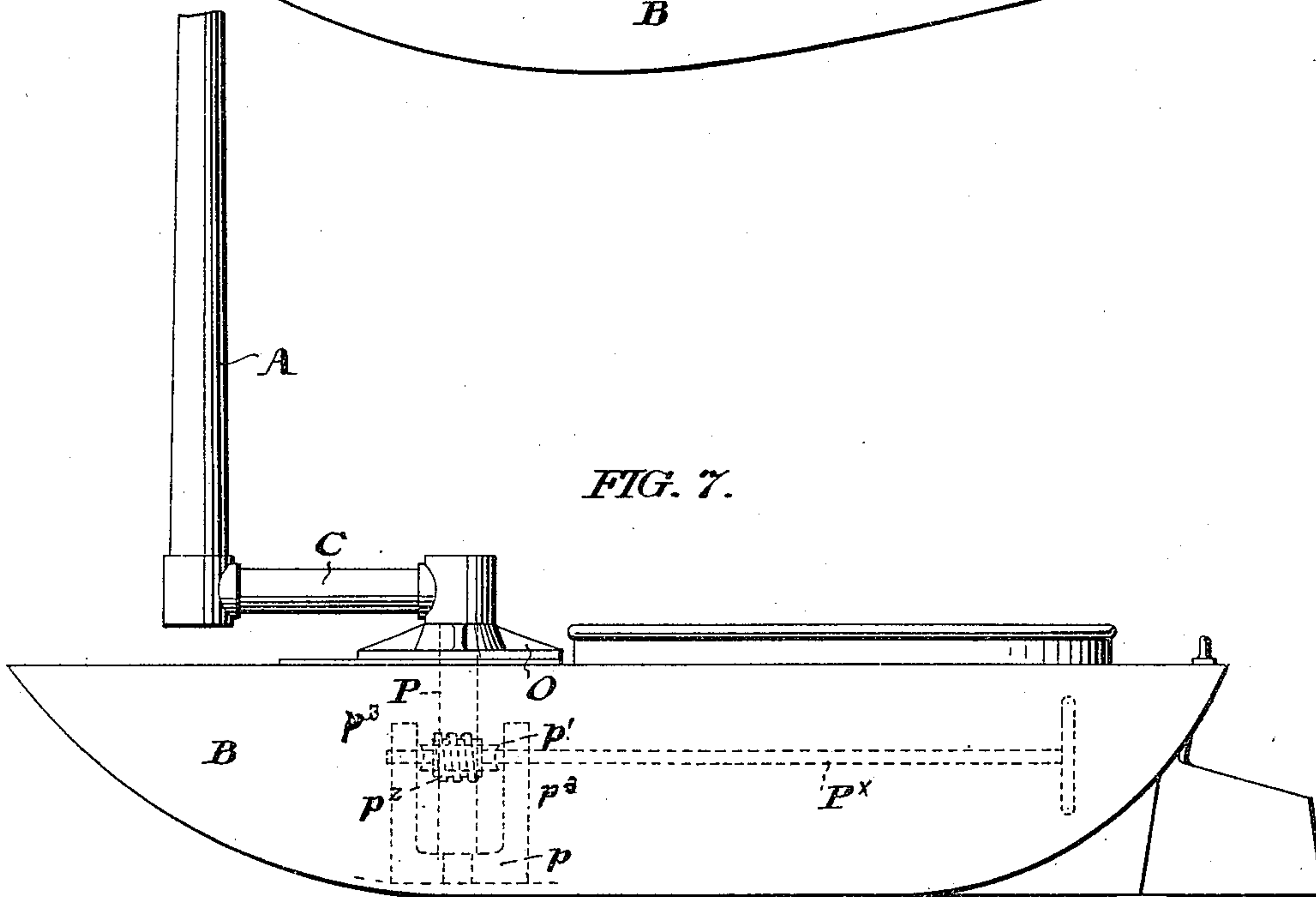


FIG. 7.



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UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA.

SAILING VESSEL.

SPECIFICATION forming part of Letters Patent No. 641,321, dated January 16, 1900.

Application filed November 10, 1898. Serial No. 696,008. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. PERKINS, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Sailing Vessels, of which the following is a specification.

My invention relates to all classes of vessels propelled by wind power, but for simplicity I have herein illustrated it as applied to small boats which possess but a single mast.

In the operation of small boats of, for instance, the "cat-boat" type, as heretofore constructed and arranged with the mast stepped fixedly and centrally over the keel near the bow, and with the gaff and boom extending radially rearward from said mast, the effect of the impact of the wind against the sail, while primarily occasioning the travel of the boat, incidentally deflects it to the leeward side so that the leeward edge of the boat is depressed toward the water level, and renders it necessary when the wind reaches a certain velocity to shorten sail to prevent capsizing.

In practice, therefore, the attainment of the theoretical maximum speed for a boat of given dimensions and sail area, is interfered with by the uneven position which it assumes and which diminishes its capacity to overcome the resistance of the water,—and by the necessity for shortening sail to prevent capsizing when the wind is no stronger than the boat could, except for the tilting referred to, endure with safety.

In the ordinary arrangement of the mast and sail, the tilting to leeward described, is not only in itself so great as to constitute a constant menace, as well as a condition interfering with the normal progress of the boat,—but the area of flotation of the vessel on the leeward side is, apart from the wind pressure, diminished by the weight of the boom, gaff, and sail,—the fact being that these members usually occupy a position on the leeward side of the vessel and bear down its edge, so that the vessel as a whole has so much less capacity for further tilting to leeward, and the measure of wind pressure which the boat can endure without shortening sail is correspondingly diminished.

In Figures 1, 2, and 3, of the drawings, I have diagrammatically represented three boats em-

bodifying my improvements, in three different positions, the boat of Figure 1 being represented as traveling toward the northwest (the top of the sheet of drawings being assumed to be north from which point the wind is assumed to blow), that of Figure 2 as traveling toward the southwest, and that of Figure 3 as traveling toward the south.

In each of these figures I have indicated in dotted lines the location of the ordinary mast and the appropriate and usual position of the sail to occasion the travel of the boat in the directions named.

In Figures 1 and 2, it will thus, by reference to the dotted lines, be perceived that the sail lies to the leeward side of the central or keel line of the boat, the result of which, as already pointed out, will be that by the weight of the sail and its associated parts, the leeward side of the vessel will be depressed;—while in Figure 3, which represents the boat as running before the wind, the sail which occupies a plane perpendicular to the keel and coincident with the mast, is so far forward that the result of the wind pressure, will, as experience has proven, be to drive the bow into the water, and to render the rolling of the vessel dangerous; the sail being all out on one side, an extra wind pressure or "flaw" is apt to send the leeward side down until the end of the boom drags in the water with the result of upsetting the boat.

My invention has for its object to provide a sail boat with such an arrangement of mast and sail as will obviate the disadvantages referred to.

I have discovered that by shifting the mast and sail of a vessel bodily toward the windward side, the disadvantages referred to may be practically overcome, for the reason that the area of flotation between the mast and sail and the leeward side of the vessel is increased to a degree which is measured by the distance the mast and sail are moved from their normal position in a windward direction; for the further reason that the transfer of the weight of the mast and sail to the windward side tends to weigh or hold down said windward side of the boat; and for the further reason that the tilting of the boat to leeward due to the pressure of the wind against the sail, becomes less as the sail is moved in

a windward direction, because the leverage exerted by the wind through the mast and sail against or upon the hull of the boat, becomes correspondingly diminished.

5 My invention, therefore, comprehends the provision of a boat provided with a mast which together with its sail and usual attachments is adapted and arranged to be bodily moved from one point to another of the hull.

10 In the accompanying drawings I show and herein I describe, a good form of a convenient embodiment of my invention, as well also as certain modified forms thereof, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the drawings,

Figures 1, 2, and 3, are diagrammatic plan views of sail boats embodying typical forms of my improvement.

20 Figure 4 is a view in top plan the mast being in section, and Figure 5 a view in side elevation, of a boat embodying a good form of my invention.

Figure 6 is a view in top plan the mast being in section of a boat embodying a modified arrangement of mast-shifting device, and,

Figure 7 is a view in side elevation of a boat embodying still another modified form of the mast shifting device.

Similar letters of reference indicate corresponding parts.

In the drawings, that embodiment of my invention which with my present knowledge of the art I prefer, is the one illustrated in Figures 4 and 5, in which figures the mast A which ordinarily would be seated or stepped in the hull framework of the boat B, is mounted upon a horizontal arm C the inner end of which is connected by a suitable joint to an upright D permanently fixed with respect to the deck or framework of the vessel,—the result of which arrangement is that the mast and arm are free to revolve together about and with respect to the said upright D to reach any desired position within their range of movement which will, of course, if said mast and arm are provided with operating devices capable of occasioning the greatest possible movement be a circle the radius of which equals the length of the arm C.

Referring to the details of said Figures 4 and 5, the junction or connection between the mast A and the arm C is conveniently effected by means of a socket E of any preferred character in which the lower end of the mast is received and secured, and in which also the outer end of the horizontal arm C, and the inner end of a keeper bar *e* are entered and secured.

Upon the keeper bar *e* are mounted keepers *e'* from which guy ropes *e''* lead to the mast head to brace or support the mast.

F is a metal bed plate permanently affixed to the deck of the vessel, and provided with a cylindrical upright or stud D upon which is mounted free for revolution a collar G hav-

ing a socket in which the inner end of the horizontal arm C is entered and secured, and a socket in its opposite side in which the inner end of a controlling bar H is entered and secured.

As will be understood, the keeper bar, the arm, and the controlling bar, constitute in effect a rigid structure, rotatable, with the mast and its attachments, upon and with respect to the upright D.

Manifestly, when the vessel is in the position shown in Figure 1 and it is desired to travel toward the northwest, (the wind being from the north) when the mast is set so that it will with its attached sail occupy the position shown in full lines in said figure, the result will be to discount so to speak the tilting effect of the wind pressure, the weight of the sail and mast tending to hold the windward side of the vessel down, and the wind pressure tending to force the leeward side of the vessel down, thus establishing an equilibrium and enabling the vessel in an ordinary wind to ride upon a comparatively even keel, not only abolishing the danger and inconvenience ordinarily experienced, but, by maintaining the boat in its normal position, enabling it to make better time.

While, of course, with an excessively high wind the boat may still be capable of tilting over to the leeward and capsizing, it will do so much less readily than in the case of boats having the ordinary fixed masts.

In Figure 2 the vessel is indicated as traveling toward the southwest and the contemplated arrangement of the mast and sail is shown in full lines in said figure.

Comparing said full lines with the dotted lines which show the ordinary position of the mast and sail, it will be seen how greatly the area of flotation and consequently the factor of safety, so to speak, of the boat is augmented.

In Figure 3 I show a contemplated arrangement of the mast and sail when the boat is running before the wind, and in this arrangement it will be seen that the whole forward part of the boat is forward of the sail, instead of the very small part of said boat as in the old arrangement.

In this figure I have indicated a bowsprit *l* as mounted on the mast and in line with the boom A^x.

Manifestly the bowsprit may be employed or omitted at pleasure; manifestly also any desired arrangement of sails rigging and customary attachments may be employed.

In whatever position the mast may be carried, it is to be understood that the wind operates upon the sails so far as the propulsion of the boat is concerned in the usual manner though with better results, and that the sails and rigging are operated and controlled in the usual manner known to those familiar with the art.

When a vessel of the cat boat type, equipped with my improved arrangement, set as shown in Figure 3, is running before the wind, it is

in effect transformed into a square rigger, with the result that the tendency to roll is diminished.

Any preferred form of mast capable as to its active or effective portion of being moved to one or another situation in the boat may, of course, be employed without departure from my invention.

So also any preferred means may be resorted to for mounting the mast and effecting this movement.

Thus, in Figures 4 and 5, the mast is moved through manually controlled flexible connections operating upon the controller bar.

As shown in Figure 5, j, j are stays mounted upon the respective sides of the boat and j', j' are flexible cords which pass through blocks j^2, j^2 connected to said stays, and thence through blocks j^3 connected respectively to the opposite sides of the controller bar, being as to their inner extremities connected to the blocks j^2 , and as to their outer ends detachably connected to cleats j^4 in the cockpit.

The occupant of the boat by drawing on one of these cords and releasing the other, may shift the controlling bar and consequently the mast to the right or left as may be desired, and the parts may be secured in the position to which they are brought by engaging the cords with the cleats j^4 .

The usual sheets are employed to connect the outer end of the boom A^x with the traveler K at the stern of the boat, and, in said Figures 4 and 5, I show said traveler as mounted upon a transversely extending stay bar L so that it may be moved transversely of the vessel to secure the boom in any desired position with reference to the mast.

Flexible connections k' lead in opposite directions from said traveler and over suitable pulleys or sheaves to the respective sides of the cockpit where their inner extremities are made fast to cleats k^2 .

In the embodiment of my invention shown in Figure 6, the mast is stepped in a metal plate M the depending sides of which embrace and extend beneath the undercut sides of a rib M^x extending across the deck.

A series of teeth m are formed on one edge of the plate M in which work the teeth of one member n of a compound wheel mounted for rotation on a stud n^x the other member n' of which wheel is connected by a band n^2 to a driving wheel n^3 situated in the cockpit and conveniently controlled by a hand wheel n^4 .

Manifestly, upon the rotation of said hand wheel, the compound wheel will be rotated, and the plate carrying the mast with it, will be shifted in a right line, and not in the arc of a circle, to port or starboard as desired.

The embodiment shown in said Figure 6 does not, owing to its being restricted to mere right and left hand movement, possess the full measure of usefulness incident to the construction illustrated in Figures 4 and 5.

In the embodiment of my invention shown in Figure 7 the lower end of the mast A is

stepped in and rigidly connected to a casting rigidly mounted upon the outer end of the arm C , and the inner end of said arm, which rests upon an annular casting O , is rigidly connected to a depending bar P which passes down within the interior of the vessel and is stepped in a suitable socket plate p .

This depending bar is intermediate of its length provided with a worm wheel p' in which engages a worm p^2 mounted upon a shaft P^x supported in suitable bearings formed in arms p^3 rising from the plate p ,—said shaft P^x extending to the cockpit where it may be provided with a hand wheel by which it may be rotated to effect the movement of the mast.

While I have in the drawings illustrated my improved movable mast as provided with the usual boom by which the sail is to be trimmed in any desired direction, regardless of the position of the mast, it is to be understood that any devices usual or fit for the purpose, and such as sheet ropes and keepers or cleats, may be employed in lieu of said boom if it be so desired.

I prefer to employ a boom for the reason, among others, that its weight as hereinbefore set out, when carried with the mast to windward, materially assists in maintaining the boat in its normal position despite the wind pressure which tends to throw the boat on one side.

Having thus described my invention, I claim—

1. A boat, a structure mounted in said boat and adapted for horizontal movement with respect thereto, a mast connected to said structure, means for occasioning the movement of said structure to carry the mast to different positions in the boat, and means for trimming or extending in any desired direction a sail attached to said mast independently of the movement of said mast, substantially as set forth.

2. A boat, a mast, a movable structure in said boat in which said mast is stepped, means for occasioning the movement of said structure to carry the mast to different positions in the boat, and means for trimming or extending in any desired direction a sail attached to said mast regardless of the position or movement of the mast, substantially as set forth.

3. A boat, a mast, a revoluble structure in said boat to which said mast is connected, means for occasioning the revolution of said structure to carry the mast to different positions in the boat, and means for trimming or extending in any desired direction a sail attached to said mast, without moving said mast, substantially as set forth.

4. A boat, a mast, a movable structure on said boat to which said mast is connected, and adapted to carry the mast to different positions in the boat, and means for trimming or extending in any desired direction a sail attached to said mast, regardless of the position of said mast, substantially as set forth.

5. In combination with a boat, a mast, an approximately horizontal movable arm to the outer portion of which said mast is connected and by which it is carried, a stationary device engaged with the inner end of said arm, and means for trimming or extending in any desired direction a sail attached to said mast, without moving said mast, substantially as set forth.
6. A boat, a mast, a boom arranged to be set in any desired direction with reference to said mast without moving said mast, and a device supporting said mast and capable of movement to shift said mast from place to place, substantially as set forth.
7. A boat, a mast capable of bodily movement from place to place therein in relation to its support, means to occasion such movement, and a boom carried by said mast and adapted to be set in any desired position, regardless of the position of the mast, substantially as set forth.
8. A boat, a mast capable of movement from place to place therein in relation to its support, means to occasion such movement, and means for extending in any desired direction a sail attached to said mast, substantially as set forth.
9. In combination, a boat, a mast, a substantially horizontal arm at the lower end of said mast, a swivel connection between said arm and the structure of the boat, means for occasioning the movement of said arm, to carry the mast to different positions in the boat, and means for extending in any desired direction a boom attached to said mast, substantially as set forth.

10. In combination, a boat, a movable device mounted in said boat, a mast upheld by said movable device, a boom or equivalent sail trimming or extending device or devices, and means for securing said mast and boom in various positions in the boat without altering the angular relation of the vertical plane of the boom to that of the boat keel, substantially as set forth.

11. In combination, a boat, a movable device mounted in said boat, a mast upheld by said movable device, a boom or equivalent sail trimming or extending device, a bowsprit or equivalent device carried by said mast, and means for securing said mast, boom, and bowsprit, in various successive positions in the boat without altering the angular relation of the vertical plane of the boom and bowsprit to that of the boat keel, substantially as set forth.

12. A boat, a structure mounted in said boat and adapted for horizontal movement with respect thereto, a mast connected to said structure, means for occasioning the movement of said structure to carry the mast bodily at the will of the sailor, to windward or to leeward; or forward or aft,—substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 31st day of October, A. D. 1898.

GEORGE H. PERKINS.

In presence of—

H. I. VANSANT,
ARTHUR E. STOKES,
T. FERNLEY BROOKS.