No. 779,440. PATENTED JAN. 10, 1905.

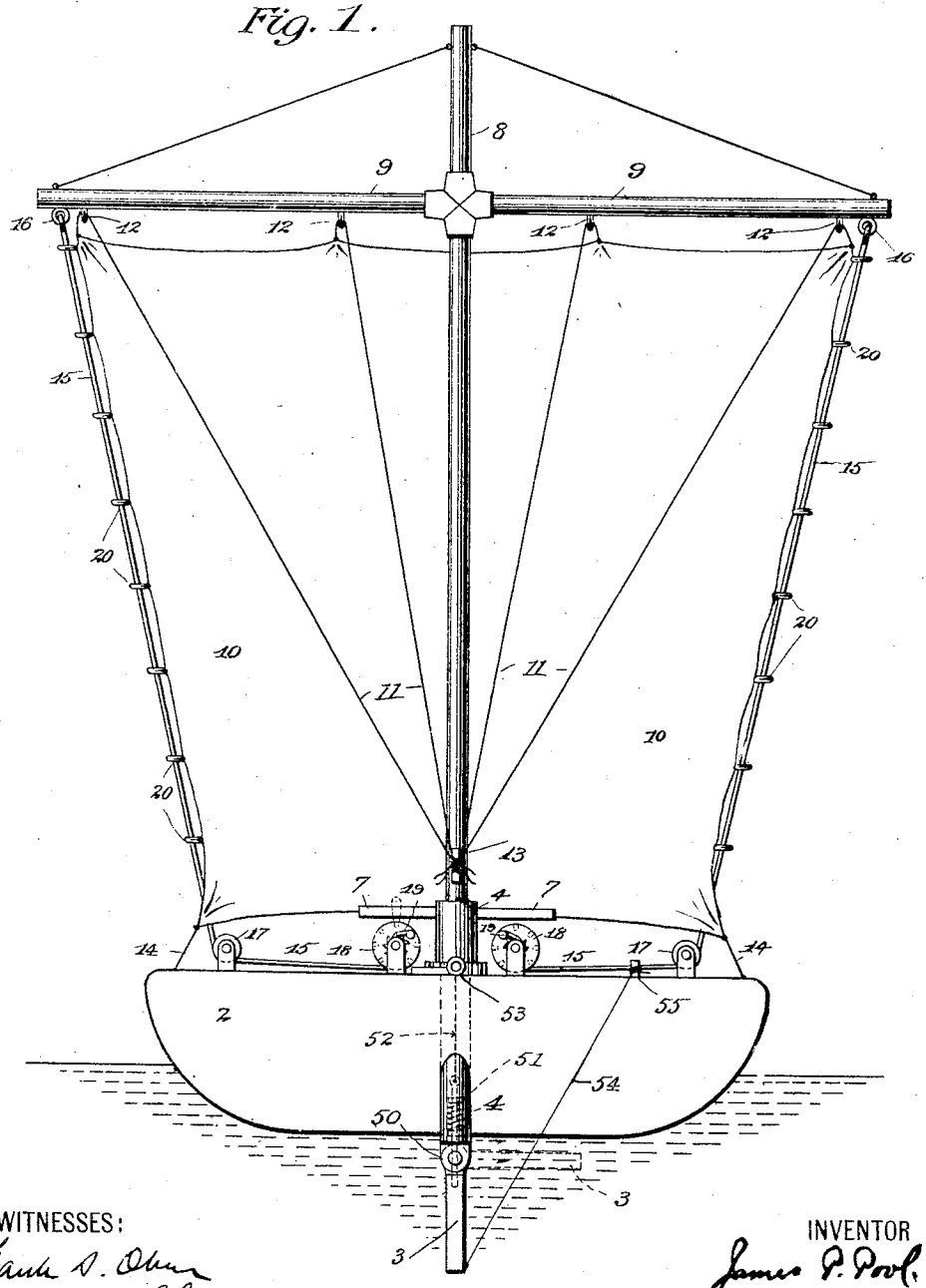
J. P. POOL.

SAIL BOAT.

APPLICATION FILED FEB. 28, 1901.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

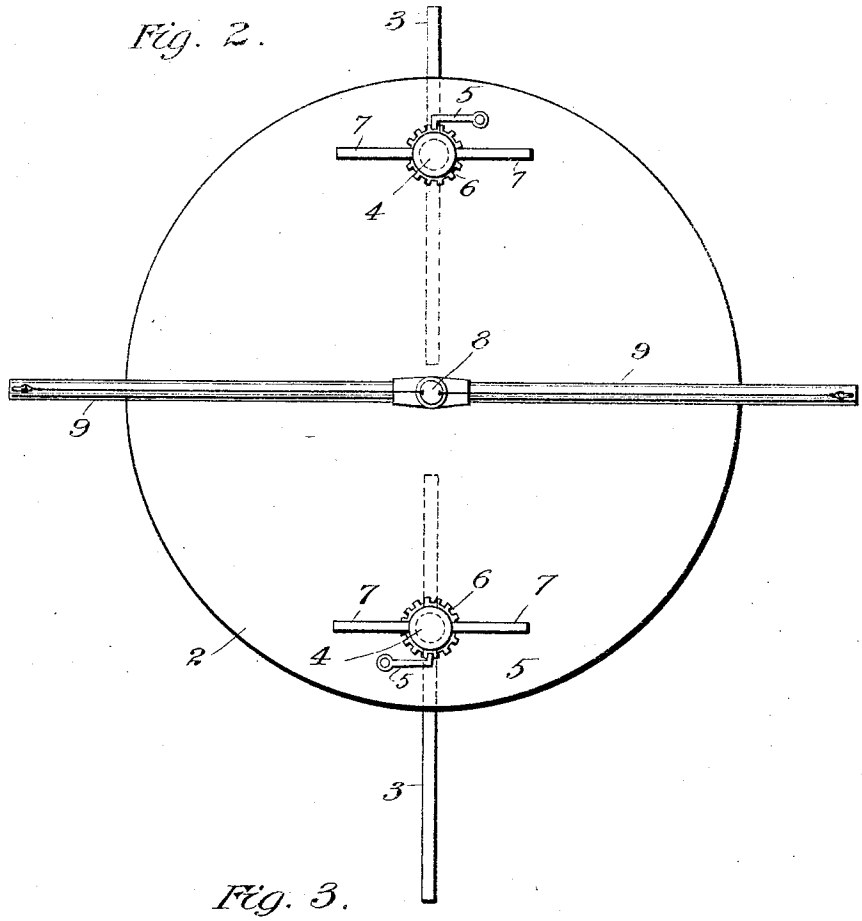
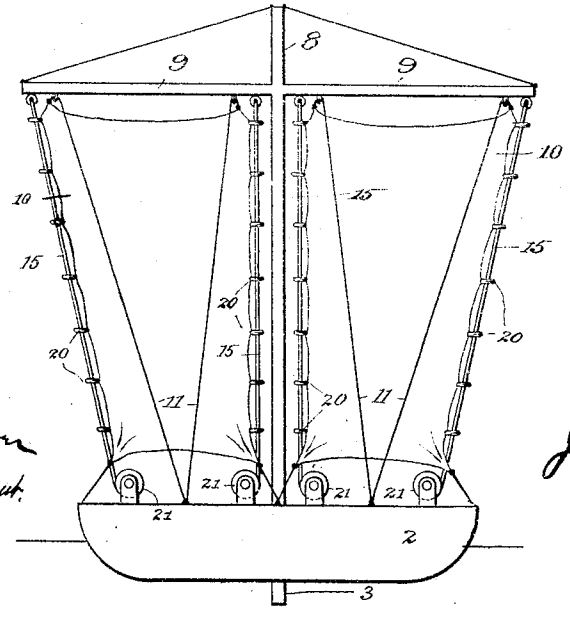


Fig. 3.



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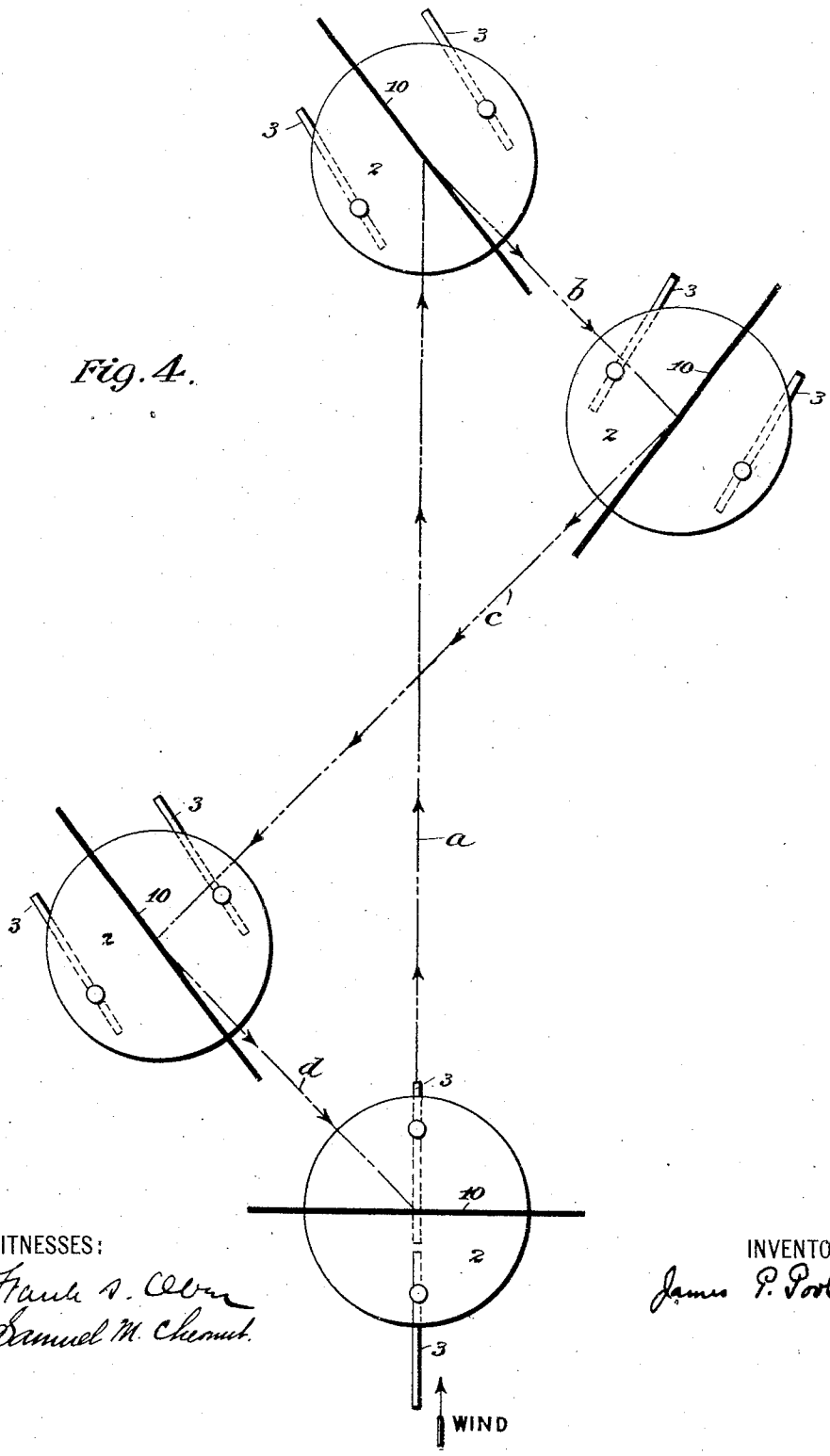
3 SHEETS—SHEET 3.

Fig. 4.



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No. 779,440. Patented January 10, 1905.

UNITED STATES PATENT OFFICE.

JAMES P. POOL, OF BROOKLYN, NEW YORK.

SAIL-BOAT.

SPECIFICATION forming part of Letters Patent No. 779,440, dated January 10, 1905.

Application filed February 28, 1901. Serial No. 49,308.

To all whom it may concern:

Be it known that I, JAMES P. POOL, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Sail-Boats, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention has reference more particularly to a sail-boat in which there is used what I term a "square" or "wing-and-wing" sail in contradistinction to the so-called "fore-and-aft" sails, though certain features of the invention may be used with a sail-boat having a different character of sail.

My invention consists in the various novel and peculiar arrangements and combinations of the several parts of the apparatus, all as hereinafter fully described and then pointed out in the claims.

I have illustrated a type of my invention in the accompanying drawings, wherein—

Figure 1 is a view in elevation of a sail-boat embodying my invention. Fig. 2 is a plan view of the sail-boat shown in Fig. 1. Fig. 3 is an elevation, on a reduced scale, of a sail-boat, showing a modified form of my invention. Fig. 4 is a diagrammatic view showing how my improved form of sail-boat is manipulated in sailing over a course before the wind and then tacking back.

Referring to the drawings, in which like numbers of reference designate like parts throughout, 2 is the hull or body of the boat, the shape of which is circular in plan view, as shown in Figs. 2, 4, and 7. The lines of this circular hull may be of any desired shape. At two diametrically opposite points of this circular hull 2 I arrange a so-called "lee-fin" 3, which may consist in a vertically-arranged board pivoted at about the center of length by means of a post 4, which is fixed thereto and passes up through the hull and projects above the deck, where it is provided with a pawl and ratchet 5 6, by means of which the post can be held at any point of its rotation in order to hold the lee-fin in adjusted position, the upper end of the post 4 being provided with a handle 7 for manipulating the same. This lee-fin or board 3 is balanced by virtue of having a considerable extent of surface lying to each side of its pivotal point formed by the post 4, and in this connection I prefer to have one wing or part of the board longer than the other, the part that points forward being by preference the shorter member. These two fins are preferably made alike, though this need not necessarily be strictly so, and they may be set so as to stand in the same vertical plane, as indicated in Fig. 2, or they may be each turned at any desired angle, so that they each stand in planes that are parallel to each other or in planes that intersect each other when extended, and, if preferred, these two pivoted fins may be geared together in any suitable well-known way, so that the movement of one is responded to by the other, though I have shown them as being independent.

A mast 8 is fixed, preferably, in the center of the circular hull 2, and 9 is a fixed cross tree or piece for sustaining the sail 10 and its side stays 15 and 15. The sail 10, which I show in Figs. 1 and 2 as being preferably formed of one piece of canvas, is hoisted and set relatively to the mast, so that it presents upon each side of the mast the same area of surface, and hence I term it a "square" or "wing-and-wing" sail. To the upper end of this sail is attached a set of halyards or ropes 11, each of which passes over a pulley 12 on the cross-arm 9 and is secured to a cleat 13, the lower end of the sail being detachably secured by suitable ropes 14, which are fastened to the deck. At each side edge of the sail there is mounted a strong stay 15, which at its upper end is attached to an eye 16 on the cross-arm 9, while at its lower end it passes under a suitable pulley 17 on the deck and has its end wound upon a small drum or reel 18, which is provided with a pawl and ratchet 19 for preventing back rotation. This side stay 15 may by means of the drum 18 be stretched very taut or loosened so as to be quite slack and permit the sail which is attached thereto to bow outwardly, the drum 18 being manipulated by hand to tighten

or loosen the stay, as desired. It is obvious that any other suitable well-known means for tightening this stay 15 may be used than the reel or drum, the particular requirement for this stay being that, since it is a very stout and strong cable or rope that is to be at times perfectly taut, some efficient means must be used for drawing the stay perfectly taut. Another feature of this side stay 15 in connection with the sail is that the sail has a sliding connection therewith by means of the eyes or rings 20, which run freely on the stays. It is also to be noted that the oblique position of the stay is a feature of my invention by virtue of which the sail having an oblique edge corresponding with the obliquity of the stay is drawn tighter the farther it is hoisted, so that by hoisting the sail under great tension the tendency is to make it lie perfectly flat when the side stays are held perfectly taut. The stay being inclined outwardly from the mast as it approaches the cross-arm 9, this, together with the oblique edge of the sail, has an action that may be compared with a wedging action.

It will be observed that by using a sail having a stay along its side edge, so that the stay can be made taut or loosened at will, I am enabled to steer the boat by manipulating either one side stay or the other. If the boat is under sail with the side stays perfectly taut, so that the sail stands flat, the course of the boat may be directed toward one side or the other by loosening one or the other of the side stays. If under such condition the starboard stay be slackened, the sail upon that side will accordingly be slackened and the effective wind-pressure thereby changed, so that the boat moves off to the port side.

In Fig. 3 I show a construction of my sail-boat having a modified form of sail, in that instead of the sail being a single sheet it is vertically divided into two, one sheet 10 lying to either side of the mast. In this construction the outer side stay 15 is inclined inwardly as it descends from the cross-stay 9 toward the deck, while the stay 15 at the inner edge of the sail is arranged vertically, though, if preferred, this inner stay may be inclined in the same manner as the outer stay, so that the two stays diverge upwardly from each other at about the same angle. The lower ends of each of the side stays 15 in this modified form are attached to a small drum or reel 21 for winding up or letting off each of the stays, as may be desired. With this construction of sail the boat may be steered by manipulating the side stays. If the boat is under sail with both of the sheets drawn flat, the boat may be directed off to starboard by loosening the inner stay 15 of the starboard sail and the outer stay of the port sail.

In Fig. 4 I show a diagram illustrating the way the fins 3 and the sail 10 are adjusted when the boat is going before the wind and again when it is tacking back against the wind. In going before the wind upon the course indicated by the broken line *a* and in the direction indicated by the various arrow-heads on said line the two lee-fins are set in the same plane with the longer part of each extending aft, and the sail which is stretched flat stands abeam of the boat. Under this adjustment of such parts the boat travels to the end of the course *a*, where it is put about on the starboard tack indicated by the line *b* and in the direction shown by the arrow-heads on such line. To proceed on the tack of the line *b*, I preferably furl the sail upon the starboard side, leaving it full set upon the other, thereby decreasing the sail area upon the starboard side. This by reason of the greater sail area upon the port side turns the boat slightly around, and when it has turned through a sufficient angle for the tack I reset the sail full on the port side, both of the lee-fins having in the meantime been turned sufficiently far around to point them into the wind somewhat higher than the plane in which the sail points, as indicated in the second position of the boat in the diagram. In this second position of the boat the plane of the sail is oblique to the plane of either of the lee-fins 3, the extension of the plane of one of the fins cutting the plane of the sail forward, while the extension of the other cuts it aft. With the sail and the fins adjusted as shown in this second position the boat moves over the line *b* to the third position, when it is put about on the port tack indicated by the line *c* and in the direction of the arrow-heads on said line. To turn the boat as indicated in the third position, I again preferably furl the sail on the starboard side, so as to cause the wind to swing the boat still farther around and until the plane of the sail assumes the angle indicated in the third position, when I reset the sail, at the same time adjusting the fins as shown in this third position. Under this condition the force of the wind is received upon what was previously the front side of the sail, and the fins being maintained in the relative positions shown the wind causes the boat to move upon the line *c*. In order to sail the boat on the tack indicated by the line *d* and in the direction of the arrows thereon, the sail is slightly furled upon the port side, so that the wind can swing the boat from the third position into the fourth, when the sail is reset and the fins adjusted as indicated. The wind now strikes the sail upon what was previously the front side of the sail, and the boat moves along in the direction of the line *d*. In putting the boat about it is not necessary to partially furl the sail upon one side, as I have described, provided the boat has sufficient headway to respond to the shifting of the fins on their pivotal points.

This boat, which has a flat bottom, may be taken over very shallow water by folding the fins 3, which are hinged on a horizontal axis

at 50 and are provided with a spring-catch 51, located on the post 4, and to which is connected a cord 52, which leads up to the deck, where it may be fastened at 53. Another cord, 54, is connected with the lower end of the fins 3 and runs around the side of the boat to a point 55 on the deck, where it may be secured. To fold the fins, the cord 52 is pulled upon to withdraw the spring-catch 51, whereupon by drawing upon the cord 54 the fin may be raised up against the bottom of the boat into the dotted-line position shown in Fig. 1.

The principal advantages of the use of the circular hull for the boat are that the boat is given a maximum beam compared with its length, so that the boat cannot be readily capsized, the boat is more easily turned in the water, and the hull can be made comparatively shallow.

It will be noted that a vessel having my improved sail, which is stayed at each of its side edges in such a manner that either one or both of such side edges can be drawn taut or loosened, can have its course controlled by merely manipulating the sail and without the use of a rudder. This character of sail resembles the fore-and-aft type of sail in that either face or side of the sail can be made to receive the wind, which is not the case with the ordinary square sail, one side of which only is used for receiving the force of the wind. At the same time this character of sail catches all the wind when running before the wind.

It will be observed that these various features of my invention are not necessarily restricted to use with a circular-shaped hull, and I wish to be understood as not limiting my invention to the specific construction herein set forth, as various modifications may be made in the different parts thereof without, however, departing from the spirit of my invention.

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

1. A boat provided with a suitable mast, a square or wing-and-wing sail, and an adjustable stay arranged at each side of said sail for tightening or loosening the sail at either or both of its side edges to trim the sail, substantially as and for the purpose set forth.

2. A boat provided with a suitable mast, a square or wing-and-wing sail, an adjustable stay arranged at each of the side edges of said sail for trimming the sail, the said sail being provided with tackle for raising and lowering it on the stays, substantially as and for the purpose set forth.

3. A boat provided with a suitable mast, a sail having either or both of its side edges inclined so that the sail is narrower at the base than at the top, an adjustable stay arranged at each of the side edges of said sail and suitable tackle for said sail to raise and lower it on said stays, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of the two subscribing witnesses.

JAMES P. POOL.

Witnesses:
SAMUEL M. CHESNUT,
A. R. COONS.