W. M. STANBROUGH.

ICE BOAT.

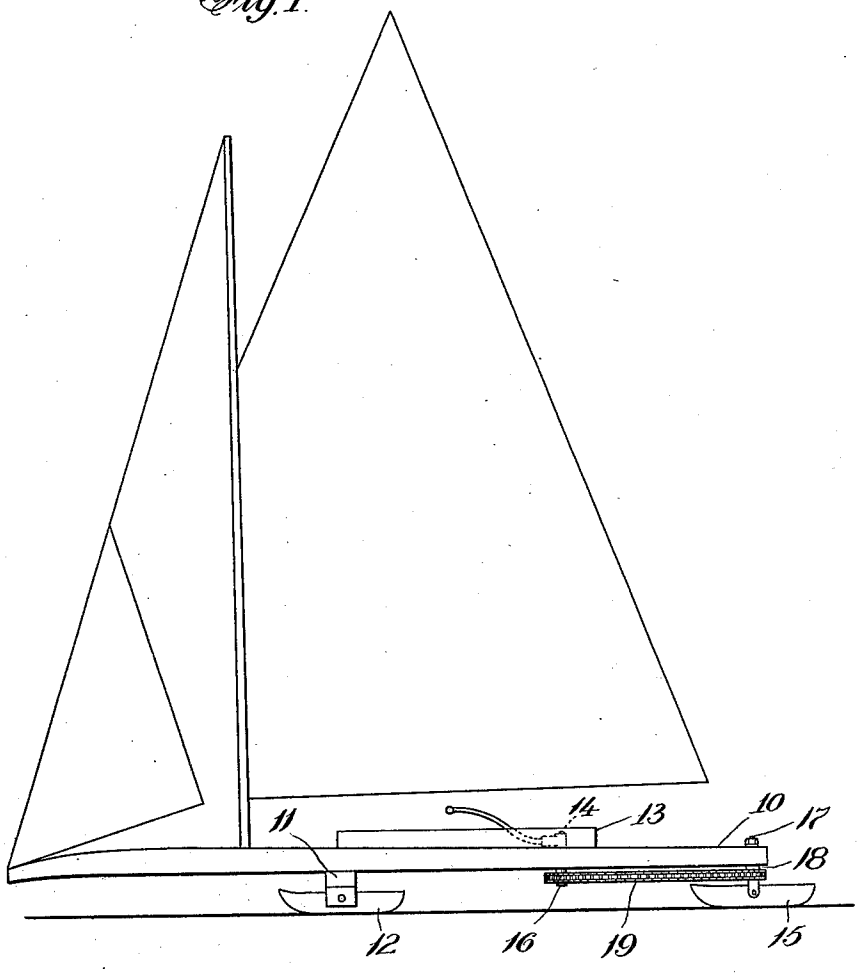
APPLICATION FILED NOV. 12, 1910.

1,082,831.

Patented Dec. 30, 1913.

4 SHEETS—SHEET 1.

Fig. 1.



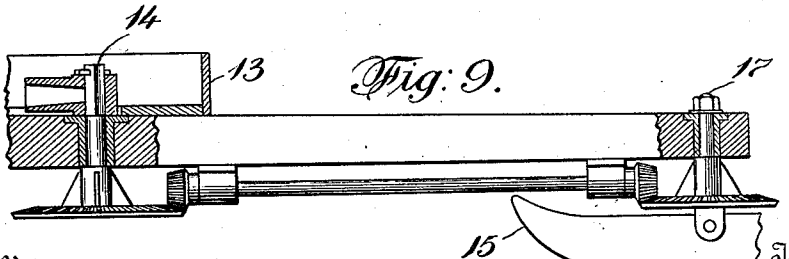


Fig. 9.

Witnesses:
John J. Kittel
Gustav Genzlinger.

Inventor
William M. Stanbrough
By his Attorney
Chas. S. Williams

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. M. STANBROUGH.

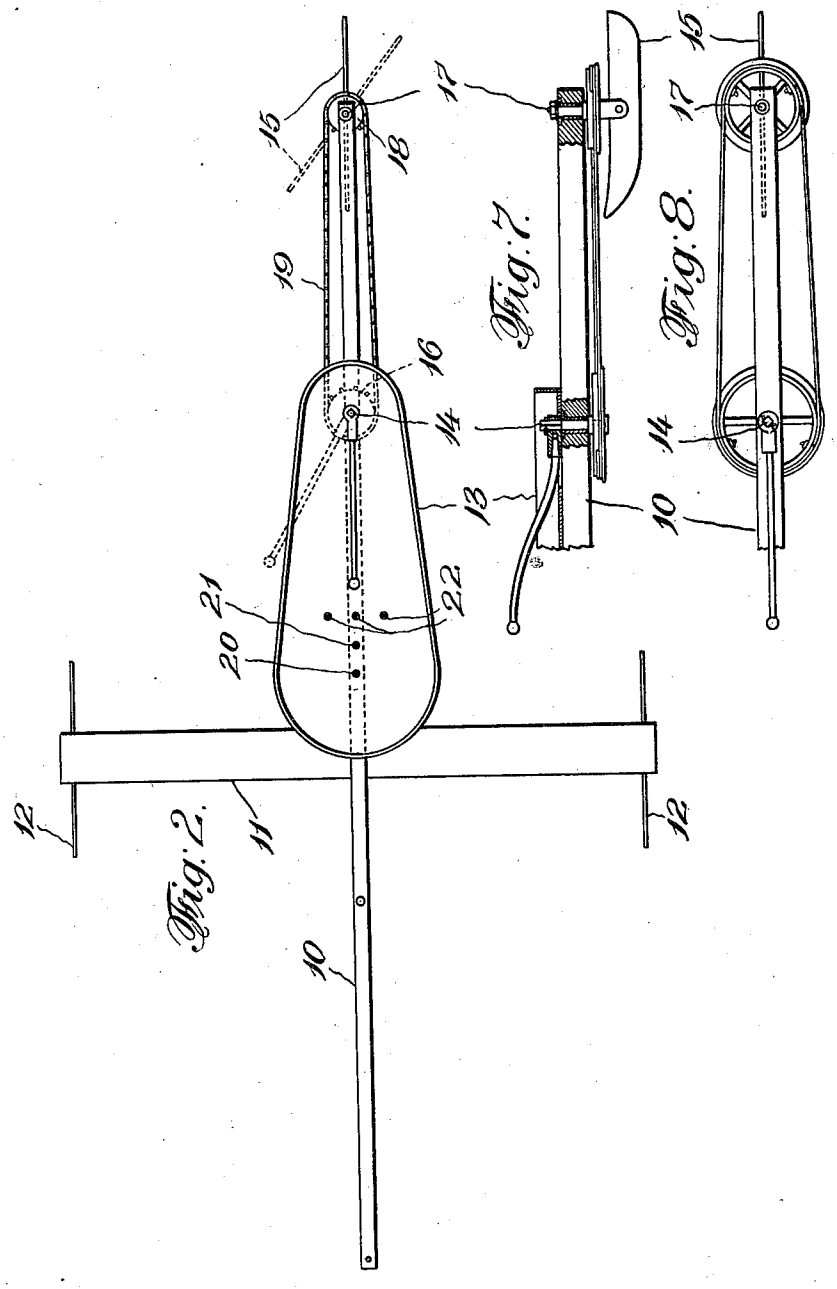
ICE BOAT.

APPLICATION FILED NOV. 12, 1910.

1,082,831.

Patented Dec. 30, 1913.

4 SHEETS—SHEET 2.



Witnesses:
John J. Kittel
Gustav Genzlinger

Inventor
William M. Stanbrough
By his Attorney
Chas. S. Williamson

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. M. STANBROUGH.

ICE BOAT.

APPLICATION FILED NOV. 12, 1910.

1,082,831.

Patented Dec. 30, 1913.

4 SHEETS—SHEET 3.

Fig. 3.

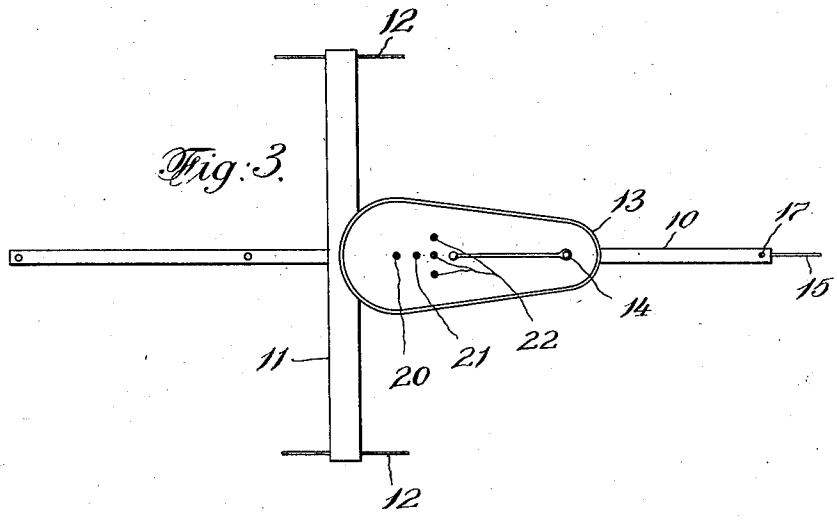
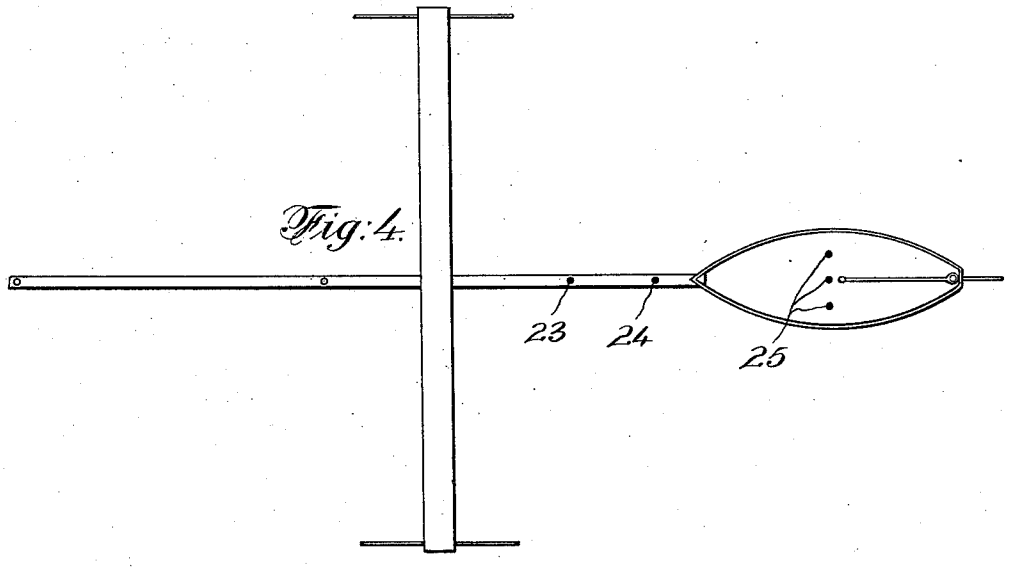


Fig. 4.



Witnesses:
John J. Kittel.
Gustav Genzlinger.

Inventor
William M. Stanbrough
By his Attorney
Chas. S. Williams

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. M. STANBROUGH.

ICE BOAT.

APPLICATION FILED NOV. 12, 1910.

1,082,831.

Patented Dec. 30, 1913.

4 SHEETS—SHEET 4.

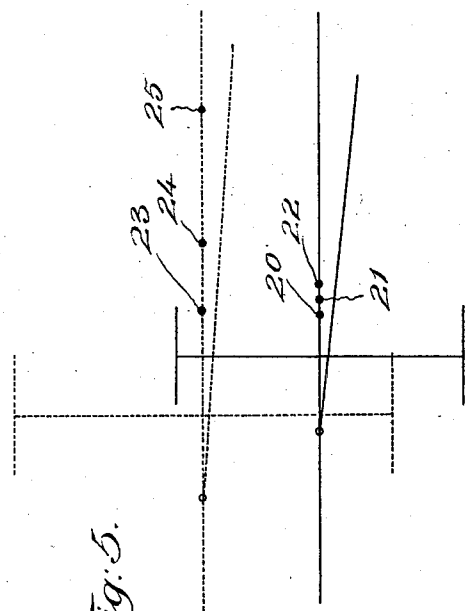


Fig. 5.

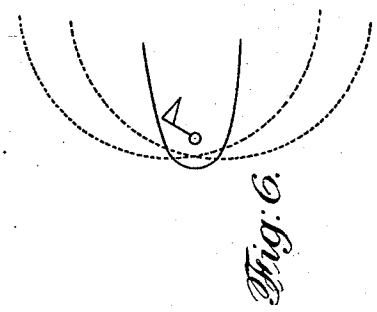
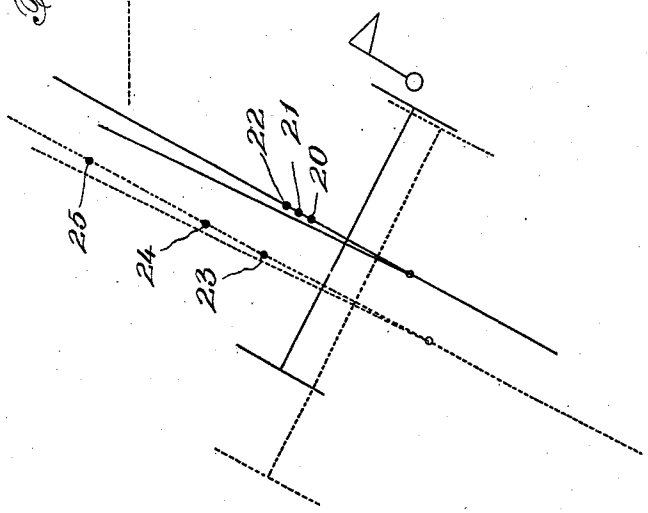


Fig. 6.



Witnesses:
John J. Kittel
Gustav Genzlinger.

Inventor
William M. Stanbrough
By his Attorney
Chas. S. Williams

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM M. STANBROUGH, OF NEWBURGH, NEW YORK.

ICE-BOAT.

1,082,831. Specification of Letters Patent. Patented Dec. 30, 1913.

Application filed November 12, 1910. Serial No. 592,000.

To all whom it may concern:

Be it known that I, WILLIAM M. STANBROUGH, a citizen of the United States, residing at Newburgh, in the county of Orange and State of New York, have invented a new and useful Ice-Boat, of which the following is a specification.

My invention relates to an improvement in ice-boats in which the centers of gravity of the boat and of the boat and load approximate, and the objects of my invention are (1) to provide an ice-boat of greater stability and sail carrying ability than the ice-boats commonly used, (2) to provide an ice-boat in which a high or high peaked sail plan is used, thereby raising the center of effort and affording greater sail propelling power, (3) to provide an ice-boat in which a short main boom is used, thereby overcoming the tendency of a long main boom to pull upward or lift the rudder-runner from the ice and throw the boat around and off her course when turning, (4) to provide an ice-boat in which the centers of gravity of the boat and of the boat and load are brought forward on the back-bone of the boat so that the load becomes available as ballast, and (5) to provide an ice-boat in which in turning a lee mark the momentum of the load becomes thrust on the lee runner instead of drag on the rudder-runner, allowing a close turn. I attain these objects by the device illustrated in the accompanying drawings in which—

Figure 1, is a side elevation of my ice-boat. Fig. 2, is a plan view with the mast and sails removed. Fig. 3, is a diagrammatic plan view of my ice-boat. Fig. 4, is a diagrammatic plan view of an ice-boat of the usual type. Fig. 5, is a diagrammatic plan view of my ice-boat and one of the usual type showing the respective positions of load and boat in turning a lee mark. Fig. 6, is a diagrammatic plan view showing the arcs of turning of my ice-boat and of one of the usual type. Fig. 7, is a side elevation partly in section of a modification of the steering device of my ice-boat. Fig. 8, is a detail plan view of Fig. 7. Fig. 9, is a side elevation partly in section of another modification of the steering device of my ice-boat.

My ice-boat comprises a back-bone, 10, a runner-plank, 11, runners, 12, a cock-pit or box for the crew, 13, a tiller-post, 14, and a rudder-runner, 15.

The back-bone, 10, is of the kind commonly used in ice-boats with the usual means for stepping the mast and attaching the rigging. The runner-plank, 11, is rigidly attached at its middle to the back-bone, 10, and is such as is customary in ice-boats and is provided at each of its ends with a runner, 12, of the form and manner of attachment to the runner-plank in common use. The runner-plank, 11, is in length relative to the back-bone, 10, less than one-half thereof, thus differing from the ordinary type of ice-boat in which the runner-plank is in length slightly more than one-half the length of the back-bone, the object being to permit my ice-boat when under wind pressure to take an angle of heel or incline away from the direction of the wind which allows the wind to pass over the top of the sail or "spill" without capsizing the boat, which can not be done when the long form of runner-plank is used because the angle of heel is such that the wind cannot pass over the sail or "spill" before the boat capsizes. The cock-pit, 13, is preferably circular at each of its ends, the forward end being wider than the after end, but I do not restrict myself to any particular form of cock-pit. The cock-pit, 13, is placed well forward on the back-bone, 10, the object being to bring the centers of gravity of the boat and of the boat and load together or approximate, the term load here meaning the weight confined within the limits of the cock-pit, that is the weight of the crew, or if the boat be sailed by one man, the weight of the helmsman. This feature of bringing the said centers of gravity approximate I claim as an essential feature of my invention and wherein it differs from all other types of ice-boats. This I accomplish by placing the cock-pit, 13, on the back-bone, 10, so that the forward end of the cock-pit comes substantially on a line running longitudinally through the middle of the runner-plank, 11. By so placing the cock-pit, 13, relative to the back-bone, 10, I have found that the center of gravity of my ice-boat falls substantially on the point, 20, the center of gravity of the boat and load substantially on the point 21, and the center of gravity of the load substantially on the point, 22, Fig. 3, so that the weight bears more directly on the runner-plank or runners, instead of as in the case of the common type of ice-boat having the cock-

pit on the after end of the back-bone, in which case I have found these centers of gravity to fall substantially on the points, 23, 24 and 25, Fig. 4.

The lines of support of an ice-boat are the lines forming the triangle from the points of contact of the runners with the ice to the point of contact of the rudder-runner with the ice; an ice-boat when standing still or sailing in a light wind thus has two lines of support, but has only one line of support in a wind strong enough to lift the windward runner off the ice, that is, the line from the lee runner to the rudder runner. By placing the cock-pit, 13, well forward on the back-bone, 10, and bringing the centers of gravity as stated I make the weight in the cock-pit act as ballast tending to hold the boat upright because of the long line of leverage between the weight in the cock-pit of my boat and the line of support of the boat, whereas in the common type of ice-boat with the cock-pit far aft this line of leverage is short and of little effect.

The floor of the cock-pit, 13, may rest on the back-bone, 10, or the floor may be arranged below the lower line of the back-bone, 10, thus lowering the weight of the crew and giving greater stability to the boat, but the floor should not be so low as to allow it to come in contact with rough or hummocky spots on the ice. In length the cock-pit, 13, should be substantially one-third the length of the back-bone, 10.

A tiller-post, 14, is attached to the back-bone, 10, passing through the back-bone within the cock-pit, 13, and held in place by any suitable means, such as nuts and flanges, as will permit the turning of the tiller-post on its axis. The tiller post, 14, may be placed outside and aft of the cock-pit, 13, provided the tiller attachable to the tiller post, 14, hereinafter mentioned, be brought within easy reach of the helmsman in the cock-pit. A tiller reaching from the cock-pit to the head of the post of the rudder-runner as common in ice-boats would be too long and impossible of operation and for this reason I use the tiller post, 14, and sprocket wheels and chain hereinafter described.

The tiller-post, 14, is extended downward below the line of the back-bone, 10, to allow of the attachment rigidly thereto of a sprocket-wheel, 16, which turns with the tiller-post, 14, for the purpose hereinafter set forth. A tiller attachable to the tiller-post, 14, is provided, but I do not restrict myself to the use of a tiller, as a wheel or other suitable means may be used for turning the tiller-post, 14.

A rudder-runner, 15, having a post, 17, is attached to the backbone, 10, near the extreme after end thereof, the post, 17, passing through the back-bone and held in place by any suitable means that will allow of the turning of the post, 17. The post, 17, is extended downward and attached to the rudder-runner, 15, which is of the usual form, by means of ears and a pin, or such means as will cause the rudder-runner to turn radially in response to the turning of the post, 17, and also afford the rudder-runner a rocker movement in riding over rough or hummocky spots of ice. A sprocket-wheel, 18, is rigidly attached to the post, 17, between the rudder-runner, 15, and the under side of the back-bone, 10, so as to turn with the post, 17. A sprocket chain, 19, engaging the sprocket-wheel, 16, on the tiller-post, 14, and also engaging the sprocket-wheel, 18, connects the sprocket-wheels, 16 and 18, and causes correspondent movement of the rudder-runner, 15, to right or left as the tiller on the tiller-post, 14, is moved to right or left. If correspondence of the angle of movement as well as correspondence of direction of movement is desired between the tiller and rudder-runner, the two sprocket-wheels, 16 and 18, should be of the same diameter. But I do not restrict myself to the use of sprocket-wheels and chain for the above purpose arranged only under the back-bone, 10, as it is obvious that they can be placed as readily on the upper or deck-side of the back-bone, 10, the arrangement on the under side being more convenient. Nor do I restrict myself to the use of sprocket-wheels and chain, as I can use any means that will cause correspondent movement of the tiller post, 14, and the rudder-runner, 15, such as drums and a cable, Figs. 7 and 8, or a shaft and beveled gears, Fig. 9.

In disposing the cock-pit, 13, relative to the back-bone, 10, so that the centers of gravity of the boat and of the boat and load approximate, in turning a lee mark the effect is that the momentum of the weight in the cock-pit of my boat is absorbed as thrust by the lee runner with the result that the boat will turn in a smaller arc than the usual type of boat, and by using the shorter main boom allowed by my construction the tendency to lift or pull the rudder-runner from the ice is overcome; whereas in an ice-boat of the usual type with the weight in the cock-pit far aft the momentum does not become thrust on the lee runner, the result being that the boat will slide or skid in turning, and in addition the long main boom has a tendency to lift the rudder runner from the ice and to throw the boat around, increasing the difficulty of steering and necessitating a wide turn. The relative differences in these respects between my ice-boat and one of the usual type are shown in Figs. 5 and 6; the solid lines referring to my ice-boat and the dotted lines to the other type. In Fig. 6, two arcs in dotted lines are shown in the case of the common type of ice-boat, one

where the boat begins to turn wide before reaching the mark and passes close to the mark, and the other where the boat passes close to the mark and turns wide after passing it, the arc of turning of my ice-boat being shown by the solid line. In the drawings my ice-boat is shown as having a back-bone twenty-four feet in length, while the common type of boat is shown as having a back-bone thirty feet in length, I having found that a boat of twenty-four feet back-bone of my construction having a runner-plank of less than one-half the length of the back-bone and the ability under wind pressure to heel and "spill" the wind over the top of the sail, is the equal in sail carrying ability of the thirty foot boat, as well as being much less in weight. My construction also permits the use of lighter runners as I do not require the weight of the runners as ballast as in the ordinary type of boat.

I do not restrict myself to any particular sail rig, as either jib or mainsail, latteen, or mainsail only or cat-rig may be used on my ice-boat provided the arrangement of the sails is such as to afford proper sail balance.

Having fully described my invention what I claim and desire to protect by Letters Patent is:

1. A sail propelled ice-boat comprising a back-bone, a runner-plank attached to the back-bone at right angles thereto and in length less than one-half the length thereof, a runner attached to each end of the runner-plank, a cockpit so disposed forwardly relative to the back-bone that the centers of gravity of the boat and of the boat and load approximate to provide a long line of leverage between the weight in the cockpit and the line of support of the ice-boat, a rudder-runner attached to the back-bone near the after end thereof, and means for operating the rudder-runner to steer the ice-boat; substantially as set forth.

2. A sail propelled ice-boat comprising a back-bone, a runner-plank attached at right angles thereto, a runner attached to each end of the runner-plank, a cockpit so disposed forwardly relative to the back-bone that the centers of gravity of the boat and of the boat and load approximate to provide a long line of leverage between the weight in the cock-pit and the line of support of the ice-boat, a tiller-post, means for attaching the tiller-post to the back-bone and permitting the turning of the tiller-post, a tiller, a forward bevel gear wheel rigidly attached to the tiller-post and turning therewith, a rudder-runner attached to a post and turning radially therewith, means for attaching said last mentioned post to the back-bone and permitting the turning of the post, an aft bevel gear wheel rigidly attached to the post of the rudder-runner and turning therewith, and a horizontal shaft having a bevel gear at each end engaging and connecting said forward and aft bevel gear wheels and providing correspondent move between said wheels; substantially as set forth.

3. In an ice-boat of the character described the combination of a back-bone, a runner-plank attached to the back-bone at right angles thereto and in length less than one-half the length thereof, and a cockpit so disposed forwardly relative to the back-bone that the centers of gravity of the boat and of the boat and load approximate to provide a long line of leverage between the weight in the cockpit and the line of support of the ice-boat; substantially as set forth.

WM. M. STANBROUGH.

Witnesses:
PETER CANTLINE,
JOHN A. SEEGS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."