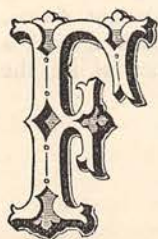


## ICE-BOATING IN AMERICA.



THE FURTHEMOST amongst the numerous attractions offered in the way of winter pastimes by our brethren on the other side of the Atlantic, is that of ice-boating. To the being inexperienced in that art, the first sail in an ice-boat is as a glimpse of a ride in another world. Yachting, boating, and all other minor pleasures of water pass into insignificance as compared to it. Can the reader imagine himself being conveyed through the air in a boat, faster than the speed of the fastest express train? The idea itself, I think, will fill him with amazement; not only will he doubt the achievement of the feat, but when he has mastered the first surprise caused by such a statement, he will come to the conclusion that, should the act be practicable, it would be fraught with so much danger that pleasure would inevitably give way to incessant fear. To the inexperienced navigator danger there certainly is, yet, our American friends say, when once the first dread of the lightning speed is overcome, fear gives way to fascination, the feeling grows on one to be always moving on at cannon-ball speed. It is rather difficult to describe one's sensations on first experiencing the rapid progress of an ice-boat—flying nearly expresses it—the sensation is like nothing else. The primary idea one has is that he must hold on very fast to save himself from being shot out.

With reference to the speed attainable by these ice-boats great exaggerations have at all times been made, but, with a wind on the beam—what is called three-quarters free—there are times that a boat can attain a speed of seventy miles, and sometimes even more per hour, should the conditions of ice and wind be both favourable; but it cannot continue at this pace, as the helmsman is frequently obliged to alter his course, so as to steer clear of rough ice, hummocks, fissures, cracks, &c.

The solution of the problem as to how a vessel can possibly sail faster than the wind has been frequently attempted, yet not to my knowledge with any practical result. Let it be understood that a boat's speed before the wind, which blows with a constant velocity, cannot equal the speed of that wind; under different conditions than this it is possible, and in accordance with mechanical principles, that the speed of a boat may equal, or even surpass, that of the wind. Suppose the boat were before the wind, which is travelling at the rate of about thirty miles an hour, the direct impetus of the wind on the sails, if fixtures, would be equal to about six pounds per square foot. But the sails are not fixtures, and move before or away from the wind, and the pressure is in this way diminished until it is balanced by the resistance met with by the boat. As the resistance of an ice-boat is very small, a high speed—nearly equal to that of the wind—is reached before the speed and wind pressure become uniform. Suppose the speed of a boat were twenty

miles an hour, the resultant pressure of the wind would be only that due to a wind of ten miles an hour, or about three-quarters of a pound per square foot. In sailing so that the wind makes a more or less acute angle with the line of advance, the conditions are entirely altered; the resultant pressure of the wind does not diminish with the advance of the boat, and its effective impulse is determinable on mechanical principles, which do admit as possible a speed of the boat greater than the actual speed of the wind.

However, it is impossible for any water-borne boats propelled by sails to exceed the speed of the wind which impels them, owing to the great resistance they encounter in wave-making; but ice-boats will move with the slightest motion, and meet with little or no resistance on their smooth course.

As most ice-boats run about the same size, with very little variation in building, I will give a description of the sizes of the material, and of the parts visible in the engraving of the famed boat *Hase*, owned by Mr. A. Innes, of Poughkeepsie, U.S.

The keel, or centre timber, is 24 ft. 6 in. long, 3 in. wide, and 9 in. deep.

The side frames are 2½ in. thick, and 4 in. deep.

At the mast a rafter, 1 ft. wide by 3 in. deep and 7 ft. 6 in. long, is fitted on top across the side frames. Underneath the mast timber is the "runner" plank, of 12 in. width, 3 in. depth, and about 16 ft. length, the side frames, mast plank, and "runner" plank being all bolted together. Sometimes the side framing is continued forward of the mast timber round to the bowsprit, and thus makes the construction look more boat-like.

The after-part of the frame is bottom-planked with inch boards, to form the deck.

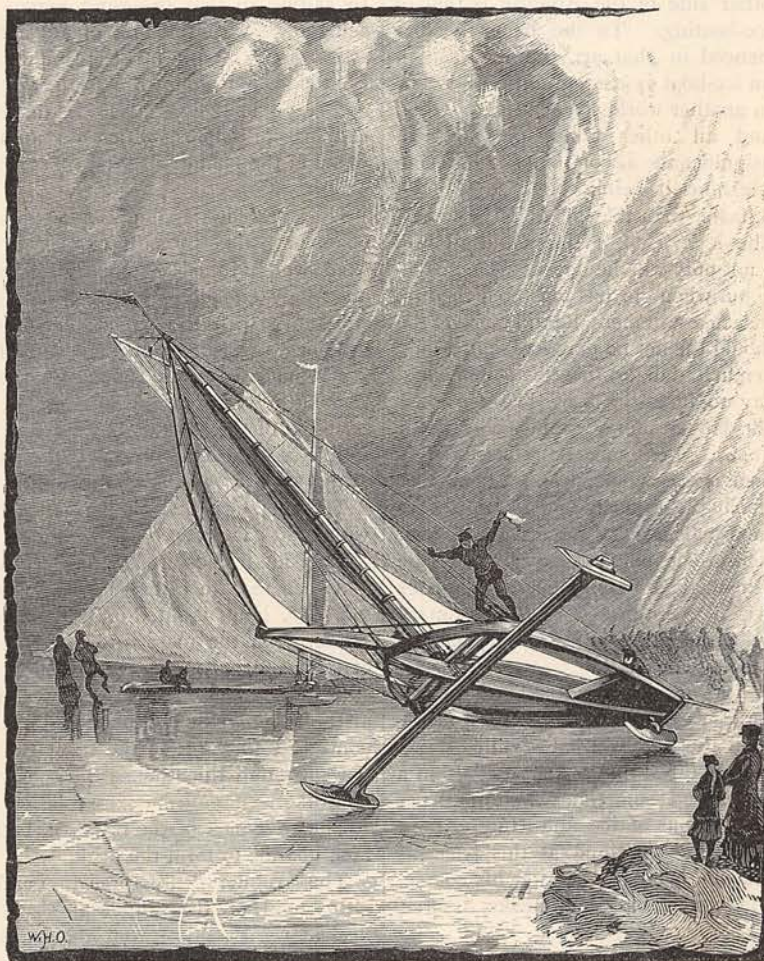
The "runners" are three in number, one fixed to either end of the runner plank (which crosses the keel at right angles), and the third is fitted aft to the keel timber and rudder post, and is used as a rudder. This runner is, as a rule, slightly smaller than the other two.

The runners are securely fitted, in a line parallel with the keel, to the ends of the runner plank. They are 6 in. deep, 2 in. thick, and about 3 ft. long. Each runner is backed with steel, and rounded up at the fore-end. The shoe is solid, and is 1¼ in. deep; 1 in. of the depth is ground to an angle of 90° V, the remaining ¼ in. forms the upper part of the shod, and is square with the top, which is 2 in. wide. The steel is "tapped" on the upper side about an inch deep. Into these taps ¼ in. bolts are screwed, and are long enough to pass through the runner and runner plank; their heads are then secured with counter-sunk nuts before the runner is fitted to the runner plank.

As a rule, nothing but two sails are carried, and the ice-boats of Toronto have but one lateen sail. The heel of the yard is jointed to the far end of the

boom; the sail has angular reefs, and requires no shifting when tacking, and is readily squared away when before the wind. The yard has a down tackle at the mast, and is hoisted by a halyard fast to a traveller round the mast, and a whip purchase.

These, then, are the dimensions of the ice-boat *Haze*. The favourite point of sailing is with the wind a point or so—before the beam, right abeam, or a point abaft the beam. With such a wind, a straight course over a smooth surface of ice, the



AN ICE-BOAT.

The dimensions of the spars are as follow :—

Mast, s'ep to cap . . . . .	20 ft.
Mast, diameter at heel . . . . .	5 in.
„ „ cap . . . . .	3½ in.
Bowsprit, beyond mast . . . . .	16 ft. 6 in.
„ depth of bowsprit . . . . .	6 in.
„ depth at outer end . . . . .	3 in.
„ width . . . . .	3½ in.
Jibboom (when one is fitted) . . . . .	15 ft. 3 in.
„ diameter at centre . . . . .	2½ in.
„ diameter at ends . . . . .	2 in.
Boom . . . . .	29 ft. 4 in.
„ diameter at centre . . . . .	4½ in.
„ diameter at end . . . . .	2½ in.
Gaff . . . . .	8 ft. 9 in.
„ diameter . . . . .	2 in.
Mainsail, luff . . . . .	14 ft. 6 in.
„ foot . . . . .	28 ft.
„ head . . . . .	8 ft.
Foresail, leech . . . . .	15 ft.
„ luff . . . . .	22 ft.
„ foot . . . . .	14 ft. 6 in.

wonderful time I have before mentioned is made. Every winter we see records of sixty miles to the hour, and I, for one, do not doubt their correctness.

One thing more, in conclusion : when such a high rate of speed is arrived at, the question that naturally arises is—How, in case of obstacles ahead, can the boat be stopped? This is done by running off to dead before the wind, and then luffing-to sharply, until head to wind. The boat is “anchored” by turning the “rudder runner” right across the keel.

On Lake Ontario, on a bright frosty afternoon, six or seven of these boats, with their happy inmates, may be seen speeding about in all directions in front of the City of Toronto, presenting a very picturesque appearance to on-lookers, and affording great pleasure and excitement to the navigators.

F. FOSTER LONG,