

UNITED STATES PATENT OFFICE.

JAMES D. FOSTER, OF CINCINNATI, AND H. C. FOSTER AND JOHN Q. MILLER, OF SPRINGFIELD, OHIO.

ICE-BREAKING BOAT.

Specification of Letters Patent No. 18,832, dated December 8, 1857.

To all whom it may concern:

Be it known that we, JAMES D. FOSTER, of Cincinnati, Ohio, and H. C. FOSTER and JOHN Q. MILLER, of Springfield, Ohio, have invented certain new and useful Improvements in Ice Cutting and Breaking Boats for Navigating When the Surface of the Water is Frozen; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the letters and figures of reference marked thereon and made to form part of this specification.

Similar letters refer to like parts of the improvement.

The nature of our improvement consists in arranging what we denominate the breaker bars with their bearings as represented for the purpose of rendering them readily removed and without stopping the operation of the machinery for so doing when it is not required to use the breaker bars, as in the case when the ice to be cut is so thin that the boat can crush it out of the way for all navigable purposes after it has been sawed.

To enable others skilled in the art to make and use our improvement, we will proceed to describe its construction and operation, by referring direct to the accompanying drawings, of which—

Figure 1, is a side elevation of a boat with the improvement attached, and shows its operation on the ice; and Fig. 2, is a top view of the boat and improvement.

Our improvement is intended to be placed on boats of any kind for navigation and operated with power obtained from the engine employed for propelling the boat or with an engine specially for the purpose, and can be worked with power of any kind that has sufficient force.

(A) is supposed to represent the hull of a boat for showing the manner of attaching the improvement to the same.

B, C, and *d*, are shafts placed in suitable bearings and united together, and set in motion with the gear wheels 4, 5, and 6. The shaft (B) is the one to which the power is applied by means of a crank, or pulley if desired (not represented), and shaft (C) is provided with a chain pulley (*e*) and furnished with a chain, J, J, which is made to pass around the chain pulley (W,) on the saw shaft *h* for operating the saws S, S.

For regulating the set of the saws S, S, to cut thick or thin ice, the saw shaft is swung and worked in the end of the levers

(*m, m*), one attached to each side of the boat, which levers are made to move up and down on the centers (*n, n*) and by the screws, *o, o*, passing through the slots, R, at the other end of the levers as represented in Fig. 1. The levers can be held in any position to suit the thickness of ice being cut with the saws S, S. When the ice is thick the saws are set lower, when thin they are elevated by the lever, *m, m*, as fully represented.

g, g, g, are bars, and what we call breaker bars, supported near their centers on bearings, *y, y, y*, and furnished at their front ends with arms projecting down at right angles with the bars, as represented by the dotted lines in Fig. 1, for breaking the ice away after it has been sawed. The bars are operated by the shaft (*d*) which is furnished with arms or cams *f* (one for each bar), which cams strike and depress the inner ends of the bars *g*, and as the bars slip off of the cams *f*, the front end of them falls with force sufficient against the ice to break it after it has been sawed, and the end of the arms that strike the ice will be sharpened to a round blunt edge, as represented, to assist in breaking the ice by applying the force to a small area on the ice. It will be perceived that the journals of these bars only rest in their bearings and are not attached or secured thereto. This allows of any one or all of them being detached at any time when it is desirable from the thinness of the ice or other causes to remove the bars.

We don't confine ourselves to any particular number of saws or breaker bars; three more or less can be used if desired. In practice the outside saw should extend a little beyond the sides of the boat to cut the ice away sufficient to prevent it from cutting the boat and interfering with the propelling wheels.

In Fig. 1, 7 is supposed to represent the ice, and being cut by the saw, S.

What we claim as new, and desire to secure by Letters Patent, is—

Making the breaking bars detachable in the manner and for the purposes herein set forth.

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H. C. FOSTER.
JNO. Q. MILLER.

Witnesses:

MARTIN BENSON,
C. H. FOSTER.