(No Model.)

W. W. GREEN.

Ice Boat and Breaker.

No. 237,859. **Patented Feb. 15, 1881.**

Fig. 1.

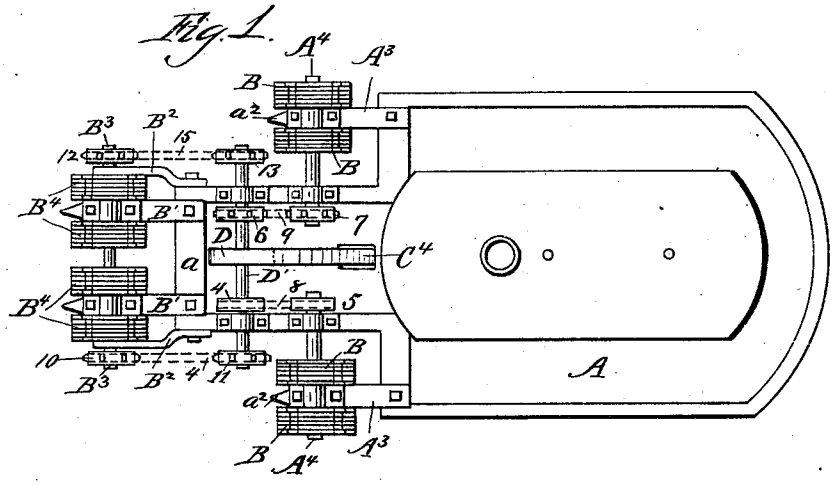


Fig. 2.

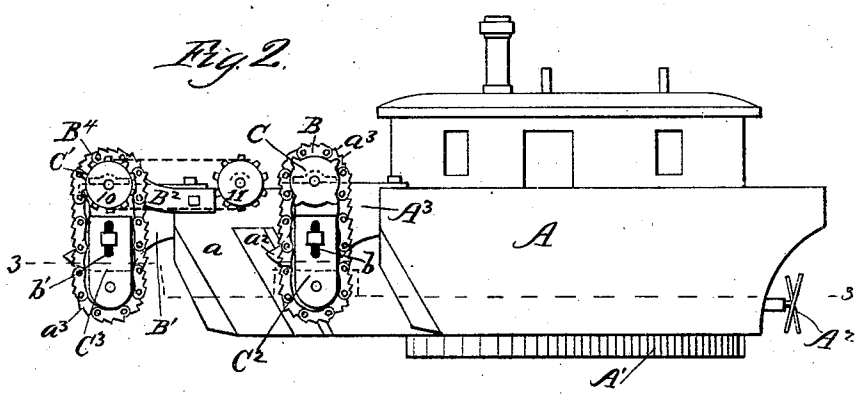
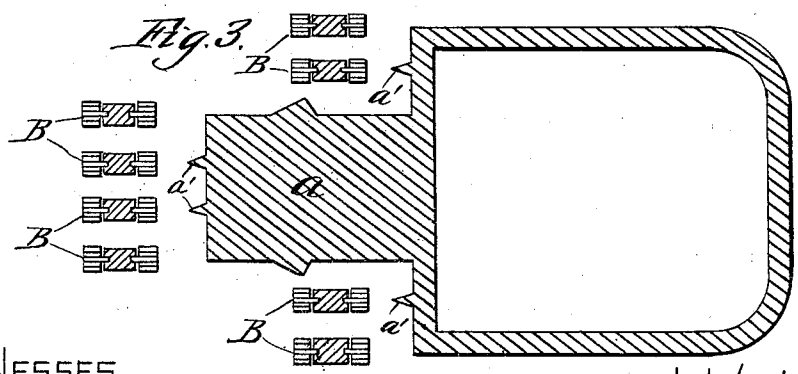


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM W. GREEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO CHARLES H. YERRY, OF SAME PLACE.

ICE BOAT AND BREAKER.

SPECIFICATION forming part of Letters Patent No. 237,859, dated February 15, 1881.

Application filed December 13, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. GREEN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanism for Cutting Channels through Ice, and of which I hereby declare the following to be a full, clear, and exact description, that will enable others skilled in the art to which it appertains to construct and operate the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, forming a part of this specification.

This invention relates to the construction and arrangement of certain devices for cutting and clearing passages through the ice when the same is an impediment to navigation; and it consists in attaching certain mechanism to the front part or bow of a boat that is constructed expressly for this purpose and is propelled by steam-power.

Figure 1 is a top view of a boat embodying my improvements; Fig. 2, a side elevation of the same, and Fig. 3 a longitudinal horizontal section in the plane 3 3, Fig. 2.

Referring to the drawings, A represents a boat, differing somewhat from the usual order of construction, propelled by steam-power through the medium of the ordinary screw-propeller. The main part of the boat forward should be somewhat wider than the stern, the lines gradually narrowing toward the after-part. The stern may be rounded off, as shown in the drawings, or left square, the principal object being to so shape the boat as to prevent wedging and the ice from coming in contact with and interfering with the action of the screw. The bottom of the boat is flat, and is provided with a V-shaped contrivance or keel, A′, having the point of the V toward the bow, and the arms thereof widely extending to the full width of the bottom of the boat as the stern is approached. This V-shaped contrivance, as shown in Fig. 2 of the drawings, may extend downward from the bottom of the boat any desired distance, and serves the purpose of preventing the floating ice from passing underneath the boat, from reaching the propeller-wheel A^2, and obstructing the free operation of the same.

The forward part of the boat is constructed with the projecting part or prow *a*, which is square as to its side-lines, but the front end is cut away at an oblique angle running inward and downward in the direction of the water-line. The prow *a* is designed to carry the ice-cutting mechanism proper. The sharp projections *a′* assist in breaking up the cakes of ice.

To the front, and on each side of the forward part of the boat, are bolted the shoes A^3, having the projecting points a^2. The shoes A^3, attached to the front end of the boat proper, serve to support and provide bearings for the outboard end of the shafts A^4, carrying and rotating the cutting devices B, the inboard end of the shafts A^4 having bearings on the sides and top edges of prow *a*, as shown in Fig. 1 of the drawings.

To the front end of the prow *a* are bolted the shoes B′, which are of the same construction as the shoes A^3. These shoes, in connecting with the arms B^2, bolted to the front end and on each side of the prow *a*, provide bearings for and support the shaft B^3, which carries the cutting devices B^4 placed in front of the prow *a*.

The cutting devices proper consist of an endless chain-saw formed of a series of segmental links pivoted together and provided with the cutting-teeth a^3. The series of chain-saws B and B^4 travel over the spurred pulleys C and C′ at the top, and move in grooved guide-rollers attached to the lower ends of the tension-bars C^2 and C^3. (Shown in Fig. 2 of the drawings.) The tension-bars are provided with the slots *b* and *b′*, which permit of a ready adjustment in order to impart the desired tension to the chain-saws or cutting devices.

The necessary power for operating the cutting mechanism may be transmitted from the motor propelling the boat by means of the belt C^4, which travels over the pulley D placed upon the counter-shaft D′, the motion and power being in turn transmitted to the chain-saws B by means of the spurred pulleys 4, 5, 6, and 7, and the drive-chains 8 and 9, running over said pulleys, and to the chain-saws B^4, through the medium of the spurred pulleys 10, 11, 12, and 13 and the connecting drive-chains 14 and 15, as shown in Fig. 1 of the drawings.

This improvement is especially adapted to

open channels and passages where the ice is of considerable thickness, the cutting mechanism being constantly kept up to the work by the action of the propeller-wheel.

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

1. The combination, with the boat A, of the prow *a*, the shoes B′, the arms B^2, the shaft B^3, the spurred pulleys C′, the adjusting tension-bars C^3, and the chain-saws or cutting devices B, all combined and arranged to operate as herein shown and described.

2. The combination, with the belt C^4, of the pulley D, the counter-shaft D′, the spurred pulleys 4, 5, 6, and 7, the drive-chains 8 and 9, the shafts A^4, and the series of chain-saws B, arranged to operate as herein shown and described.

3. The combination, with the counter-shaft D′, of the spurred pulleys 10, 11, 12, and 13, the drive-chains 14 and 15, the shaft B^3, and the series of chain-saws B^4, all combined and arranged to operate as described.

WILLIAM W. GREEN.

Witnesses:
L. M. FREEMAN,
W. A. SCHONFELD.

Correction of Letters Patent No. 237,859.

It is hereby certified that in Letters Patent No. 237,859, granted February 15, 1881, for an improvement in "Ice Boats and Breakers," upon the application of William W. Green, the name of the assignee of one-half interest was erroneously written and printed Charles H. Yerry, instead of Charles H. Terry; that the proper corrections have been made in the files and records of the Patent Office and are hereby made in said Letters Patent.

Signed, countersigned, and sealed this 10th day of March, A. D. 1881.

[SEAL.]

A. BELL,
Acting Secretary of the Interior.

Countersigned:

E. M. MARBLE,
Commissioner of Patents.