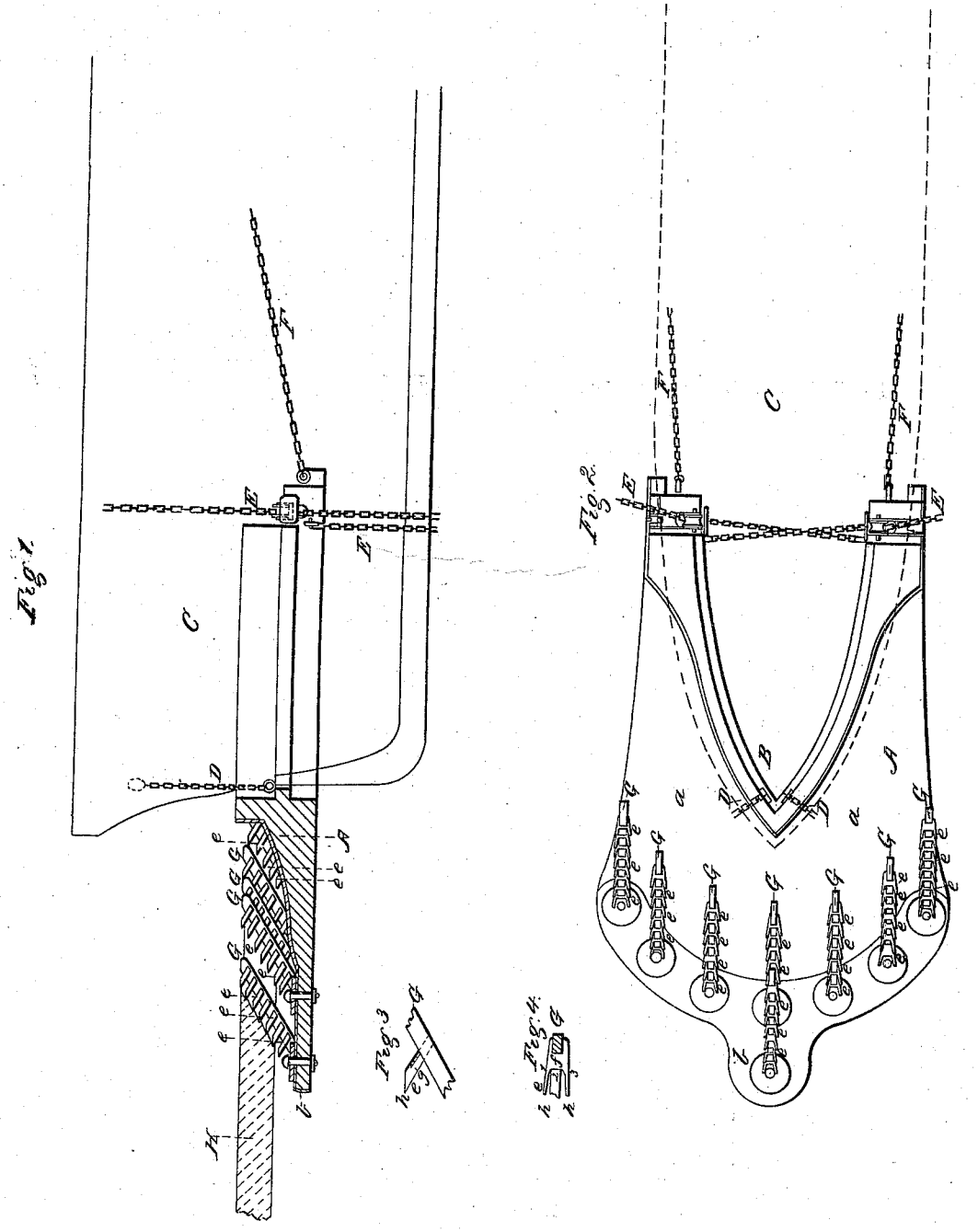
T. Estlack.

Ice Boat & Breaker.

No. 17,209. Patented May 5, 1857.



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UNITED STATES PATENT OFFICE.

THOMAS ESTLACK, OF PHILADELPHIA, PENNSYLVANIA.

ICE-CUTTING ATTACHMENT TO VESSELS.

Specification of Letters Patent No. 17,209, dated May 5, 1857.

To all whom it may concern:

Be it known that I, THOMAS ESTLACK, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and improved ice-cutting device or attachment to be applied to vessels to enable them to cut their passage through the ice as they are propelled along; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a longitudinal vertical section of my improvement applied to a vessel. Fig. 2 is a plan or top view of ditto. Fig. 3 is a side view; and Fig. 4 is a top view of one of the teeth of the cutters.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in attaching to a double inclined plane or share a series of cutters, the cutters being attached to the front of the share and inclined so that the teeth of the cutters which are made on the saw principle, will cut the ice with the greatest facility.

The share is attached to the bow of the vessel by means of chains so arranged that the share may be adjusted as desired, and the cutters are so attached to the share that they may turn and adjust themselves in proper position whenever the vessel is turned. The cutters cut the ice into strips which, as the vessel is moved along are raised up, broken, and cast at each side of the bow of the vessel by the share.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents what may be termed a share. This share may be constructed of metal, or wood sheathed with metal plate, and has two inclined sides (*a*) (*a*) which may be compared to a double mold board plow. The precise form or inclination of the sides (*a*) (*a*), may vary according to circumstances, but the inclination of the sides should in all cases be sufficient to raise the strips of cut ice and cast them off in a broken state at each side of the bow of the vessel. The share A has an opening B made in it to receive the bow of the vessel C, shown in red, the form of the opening B corresponding to that of the bow. In the front end of the opening B two chains D, D, are attached. The upper ends of these chains are attached to the front end of the deck of the vessel and support the front end of the share. The back end of the share is supported by two chains E, E, placed one at each side of the share. The upper ends of these chains are attached to the deck of the vessel, said chains passing underneath the vessel as shown clearly in Fig. 1. To the back end of the share two chains F, F, are attached, one at each side. These chains are also secured to the deck of the vessel, but some distance back from the points where the chains F, E, are attached. By adjusting the chains D, D, E, E, F, F, the share A may be secured at the desired height, and the share may also be firmly secured to the bow of the vessel.

The front end of the share A is of semi-circular form, with a projection (*b*) at its center, and near the front end of the share a series of inclined bars G are attached by pivots or bolts (*c*), said pivots or bolts passing through the centers of circular disks (*d*) at the lower ends of the bars G. The bars G are consequently allowed to turn on the pivots or bolts (*c*). A bar G is also attached to the projection (*b*). The bars G are constructed of metal, cast or wrought iron, and to each bar a series of teeth (*e*) are attached. The form of these teeth is distinctly shown in Figs. 3 and 4. The teeth are formed of steel plates (*f*) having their sides (*g*) bent downward, the front ends of the sides being beveled so as to form a cutting edge at (*h*), the front parts of the plates (*f*) being cut out so as to form three cutting edges (1) (2) (3). See more particularly Fig. 4. The teeth (*e*) are attached to the bars G at right angles or nearly at right angles and are placed one above the other, a requisite space being allowed between them.

The share A is adjusted to the bow of the vessel so that the lower ends of the bars G will be just below the lower surface of the ice designated by H, see Fig. 1. As the vessel is propelled along the teeth (*e*) will cut the ice into strips, and these strips will be raised up, broken and cast off at each side of the bow of the vessel by the inclined sides (*a*) (*a*).

I would remark that the front end of the share should be rather wider than the vessel at its widest part, in order that the device may cut a free passage for the vessel. This will be understood by referring to Fig. 2.

In consequence of having the bars G inclined and the teeth (*c*) constructed and attached to the said bars as shown, the cutters as they are pushed along cut the ice with great facility.

I am aware that shares or inclined planes provided with cutters have been applied to vessels for the purpose herein described, but circular cutters, and circular saws have been employed, the saws or cutters being driven from the engine by the vessel. Pounders have also been devised for breaking the ice. These devices however are complex, costly to construct and liable to get out of repair.

In consequence of having the bars G pivoted to the share as shown the bars are allowed to turn when the vessel is turned and are therefore prevented from being broken, the cutters adjusting themselves so as to cut in line with the direction of the movement of the vessel.

I do not claim, separately, the share A, for that or its equivalent has been previously used;—but,

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

1. The cutters formed of the teeth (*c*) constructed substantially as described, and attached to the inclined bars G, which are pivoted to the share A, as shown.

2. I claim the share A when applied and secured to the bow of the vessel by the chains D, D, E, E, F, F, and used in connection with the cutters; the whole constructed and arranged as herein described, for the purpose set forth.

THOS. ESTLACK.

Witnesses:
JNO. S. ROHRER,
EARL PENN ROHRER.