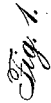
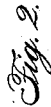


Ice Implement.

Patented Aug. 26, 1846.



UNITED STATES PATENT OFFICE.

WM. BLOUNT AND JNO. CAMMETT, OF OSTERVILLE, MASSACHUSETTS.

CUTTING AND REMOVING ICE.

Specification of Letters Patent No. 4,713, dated August 26, 1846.

To all whom it may concern:

Be it known that we, WILLIAM BLOUNT and JOHN CAMMETT, of Osterville, in the county of Barnstable and State of Massachusetts, have invented a new and useful improvement in machinery for cutting channels or passages through the ice or frozen surface of the water in harbors, rivers, &c.; and we do hereby declare that the nature of our invention is fully set forth and represented in the following description, accompanying drawings, letters, figures, and references thereof.

Of the aforementioned drawings Figure 1, denotes a top view of our improved machine or ice clearer. Fig. 2 is a side elevation, and Fig. 3 is a central, longitudinal and vertical section of it.

In the said figures A exhibits a gondola or steam vessel or boat, and B a double inclined plow or mold board arranged over it and extending beyond and resting upon the bow thereof, as seen in the drawings. The said double plow should be so supported upon the bow of the boat by journals resting and moving in suitable bearings, as to be capable of being raised and lowered at its front or rear end; that is to say, it should have a rocking or fulcrum shaft C adapted to it, in such manner as to enable its rear end to be elevated so as to depress the front end of it as far below the surface of the water, ice or deck as may be necessary to cause the ice to mount or rise up the plow, when the boat is impelled forward. The plow is sustained in any inclined position by two stanchions or posts D, D', which have curved slots or openings E, E, made through them (as seen in Figs. 2, 3) for the purpose of receiving the ends of a horizontal bar or beam F, which is bolted or otherwise secured to and extends from a timber G, which extends rearward from the central part of the double plow, as seen in the drawings. The ends of the bar F, rest on pins H which are passed through the stanchions, at such heights above the deck as may be necessary to elevate the rear end of the plow to the required degree. The front part of the plow or that which passes under the ice, and may be termed its nose, is a flat inclined plane. This plane terminates in two flaring or curved wings I, K, which have

vertical curved guides L M, L M, applied to them, in such manner as to cause the ice after it has risen up the plane to take lateral directions and be thrown or discharged over the sides of the vessel, and upon the surface of the ice immediately adjacent to the said sides.

The inclined plow has a frame N secured to and above it, and upon posts O, O, O, as seen in the drawings. At the front end of the said frame N, a transverse horizontal shaft P is arranged, and made to be supported by and revolved in suitable bearings applied to the frame. The said shaft carries or has fixed upon it three or any other proper number of circular saws Q, R, S, which are disposed with respect to the nose of the plow as seen in the drawings. The said shaft and saws are put in revolution (in order to cause the latter to cut into the ice) by means of two bands or endless chains T, T', each of which works over or about two pulleys or toothed wheels U, V, U', V'; the pulleys U, U', being affixed on the ends of the shaft P, while the pulleys V, V', are situated upon those of another shaft W, arranged underneath the double plow, and supported in suitable bearings affixed to the deck of the boat. The shaft W receives its motion from a main driving shaft X, which is to be operated by the steam engine of the vessel, the rotation of the shaft W being effected from that of the shaft X, through two pulleys or cogged wheels Y, Z, and a band or endless chain a' applied to the said shafts, as seen in the drawings.

In the rear of the circular saws and situated somewhat above the inclined plane or front part of the plow is a series of toothed cylinders or rollers b', b' &c which are arranged parallel to each other and supported in or by a frame c', as seen in the drawings. The frame c' should be suspended or applied to the frame N in such manner or by such mechanical contrivances as will admit of the series of toothed cylinders b', b', being made to approach toward or recede from the inclined plane of the plow. The several cylinders or rollers b', b' &c have their surfaces covered or studded with points or teeth d', d' &c which enable them to impel the ice up the plow after it is cut by the saws and received upon the said plow.

Each of the toothed cylinders has a toothed wheel e' fixed upon its axis or shaft, the said cogged wheel engaging with or being driven by one of two endless chains f, g , which also pass around or engage with toothed wheels h, i , fixed upon the ends of a horizontal shaft k , sustained in bearings applied to the tops of the stanchions hereinbefore mentioned.

A toothed wheel l is fixed upon the shaft k at or near its center. A similar toothed wheel m is also applied or affixed upon the main driving shaft, motion being communicated to the shaft k through an endless chain n , which passes around the wheels l and m . When the machine is to be put in operation upon the ice, the nose or front end of the plow is to be depressed into the water far enough to pass below the lower surface of the stratum of ice to be removed. This being done, the circular saws are to be put in revolution and thus the boat forced forward so as to carry them against the edge of the ice and cause them to cut into and through the ice. As the boat continues to move forward the ice is received upon the plough, which, passing under it, lifts it and breaks it away from that into which the saws are cutting. The ice thus separated, is seized by the toothed cylinder or cylinders b', b' , &c., which are to be made to revolve in such manner as to cause it to quickly pass up the plane of the plow and upon its inclined mold boards from and by which it is discharged in lateral directions by the combined action of gravity and the impulsion it receives from the toothed cylinders. When the ice is so discharged, it falls upon the frozen surface adjacent to the sides of the boat.

The two exterior circular saws Q, S , should be arranged at a distance apart from one another somewhat greater than the exterior width of the vessel or boat to which they are applied. This will enable them to cut a channel through the ice of sufficient width to allow of the forward movement of the boat. In order to prevent any great accumulation of ice upon the plow from sinking the bow of the boat so far beneath the surface of the water, as to impede the action of the saws or other part of the machinery, two timbers q, r , may be affixed to the boat, and made to extend from the bow and over the surface of the ice in advance of the saws, and so as to rest and take a firm bearing upon the said ice, the same being as represented in the drawings, where s is supposed to denote the stratum of ice.

As it will often be desirable to cut a channel or passage through the ice of a greater width than the distance between the exterior outside surfaces of the two saws Q and S , it becomes necessary, in order to insure the correct action of the saws and

toothed cylinders, to remove from the surface of that part of the ice to be cut (when the vessel returns) such ice as may have been dropped or deposited upon it by one of the inclined or covered mold boards of the plow. For this purpose, we attach to the side of the vessel a strong triangular or other proper shaped timber frame or wing t , which is made to rest upon the surface of the ice adjacent to the side of the vessel, and to extend from the side to such distance as may be desirable to clear of dropped ice. The front edge of said wing or frame should make an obtuse angle with the side of the vessel, as seen in the drawing in order that when driven or impelled against the ice dropped from the plow, it shall force the same out of the way or in a lateral direction away from the side of the vessel. That part of the said wing or frame which acts against the ice may be shaped like the mold board of a common land plow, and be made to lift the ice and lay it in a regular pile or heap, in a manner similar to that in which such a mold board lifts and turns earth in order to make a furrow. A wing or lateral plow of the above description may be applied to one or both sides of the vessel and be made to take off and put on, as occasion may require.

Ice breakers or cutters, as heretofore constructed, either have the channel encumbered with the removed or broken ice, or force the said broken ice underneath the frozen ice upon the water. When the broken or separated ice is so forced beneath the ice from which it has been removed, it is very apt to be carried back by the tide or by currents into the open channel. By our invention, this difficulty is prevented, as we remove the separated ice from the water and throw or discharge it upon the frozen surface of the river or harbor.

We therefore claim as our improvement adapted and to be applied exclusively to the removal of ice from harbors, etc.—

1. The combination of the gang or series of saws, the lateral discharging plow, and the series of revolving toothed cylinders $b' b'$; the whole being arranged and operating in concert as above described.

2. Also the manner of combining the apparatus for cutting and removing the ice, with the boat so as to enable the former to be adjusted to the ice to be cut; the same consisting in applying the discharging plow with its cutters and toothed cylinders, to the boat by means of a fulcrum or rocking shaft C stanchions or posts D, D' , and other contrivances connected with the same as set forth the whole being combined arranged and operated together so as to elevate or depress the nose of the plow as hereinbefore specified.

3. Also, one or more lateral wings or

plows or frames *t*, or other mechanical
equivalents, as combined with the hull and
main lateral discharging plow, and operat-
ing to discharge the ice from the frozen
5 surface contiguous to the side or sides of
the vessel, in the manner and for the object
as hereinbefore explained.

In testimony whereof, we have hereto

set our signatures, this nineteenth day of
March, A. D. 1846.

WILLIAM BLOUNT. [L. S.]
JOHN CAMMETT. [L. S.]

Witnesses:

GEO. LOVELL,
ABBY F. LOVELL.