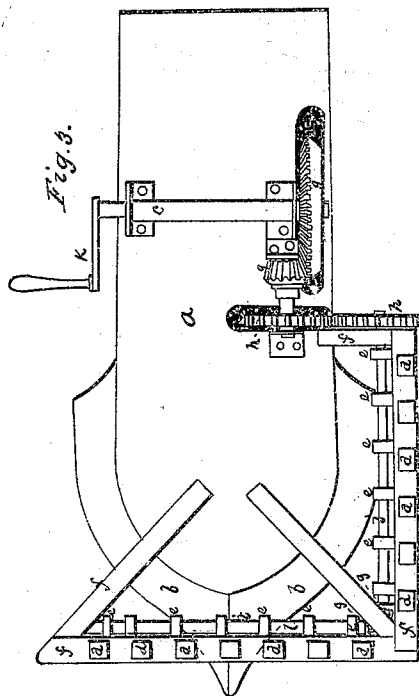
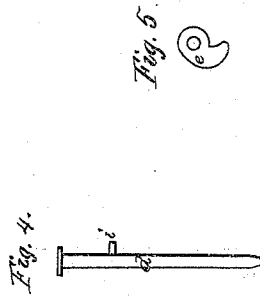
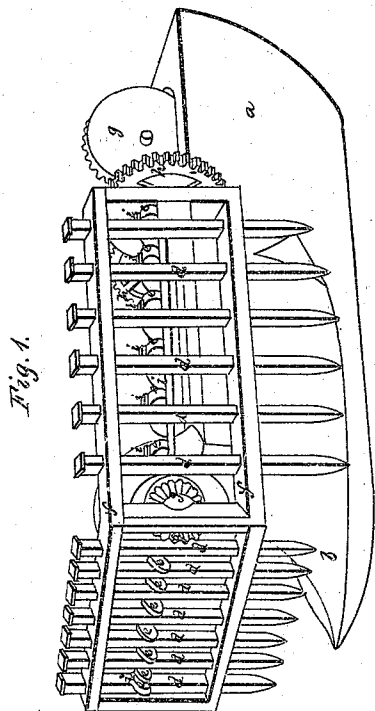
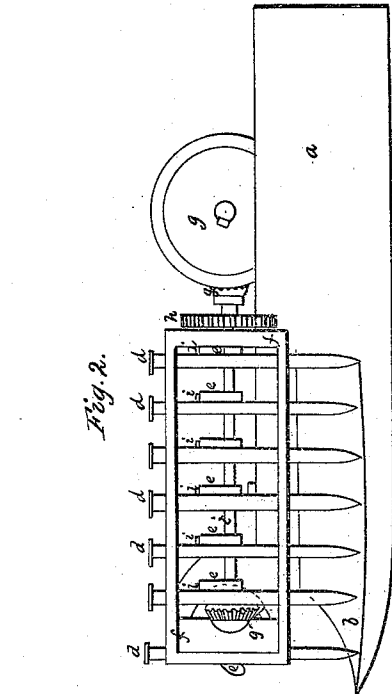


Z. Oram. Ice Boat.

N^o 17,052

Patented Apr. 14, 1857.



UNITED STATES PATENT OFFICE.

ZACHARIAH ORAM, OF CAMDEN, NEW JERSEY.

ICE-BREAKING BOAT.

Specification of Letters Patent No. 17,052, dated April 14, 1857.

To all whom it may concern:

Be it known that I, ZACHARIAH ORAM, of the city of Camden and State of New Jersey, have invented a new and Improved Ice-Breaking Apparatus, for the Purpose of Keeping Rivers Navigable; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a perspective view; Fig. 2 a plan; Fig. 3 a side elevation; Figs. 4 and 5 are separate views of the pointed plunger and cam.

Like letters referring to like parts, letter *a* the hulk; *b* the false bow; *c*, the wheel shaft; *d*, heavy iron plungers; *e e*, cams; *f f* heavy framing of timber supporting the working parts; *g g*, bevel gearing; *h*, spur gearing; *i i*, arms on the plungers to the shaft.

The drawings show only one side and front of the boat fitted up with the ice-breaking apparatus. The other side would be exactly similar in all respects to the one shown. The crank *k* is only attached for the purpose of moving readily or showing the operation of the various parts.

My improved arrangement consists in providing a suitable boat with a heavy frame work of timber projecting beyond the bow and sides of the boat, and extending sufficiently far in front to admit of one or more series or rows of plungers and extending aft sufficiently far to admit of one row of three plungers on each side of the bow.

A series of heavy iron, pointed plungers or breakers, *d d* are arranged, and operated vertically, and in line with each other, in the mortises cut in the framing. They are acted upon by a series of involute cams on the shaft *i*, said shaft being connected by gearing to the wheel shaft. It is put in motion by the engine and proves a most efficient (line) or series for line or continuous splitting off of the ice. The false bow *b* I do not consider essential to the proper working of the improvement. It can be dispensed with, and the boat built, so that the bow can be forced upon the ice, and thus by her weight assist in breaking it.

The plungers are made pointed at their lower extremities such shape being preferable to any other for the purposes herein specified. The operation and advantage of my improvement are as follows: The engine being started the gearing causes the shaft *i* to revolve the cams *e e*, raise the plungers *d d* by means of the arms *i i* a distance of three feet or more, when as the shaft revolves the cams pass from under the arms, the plungers fall heavily, the points force their way into the ice, whereby I have the advantage of their being in line with each other forming a series or continuous line splitting off from the ice in front and sides of the boat, at the same time, giving free passage to the bow and paddle wheels.

In order that the engine may be reversed when occasion requires, it will be necessary to throw the wheels out of gear, which may be done by any of the means in common use. It was not deemed essential to show the same.

In my plan and arrangement for breaking ice as in the accompanying drawings set forth, I claim a superiority over any other plan or arrangement heretofore invented, in that my plan consists in the arrangements in line of each other of a series of vertically operated pointed plungers or breakers, as is herein set forth, and in that the power is direct in its application whereby much greater efficiency is secured than in the patent of B. S. Gillespie or that of any of the various arrangements that have heretofore been invented.

I wish it to be distinctly understood that I do not claim to be the inventor of the various parts herein described, but

What I do claim and desire to secure by Letters Patent is—

The arrangement of a series of pointed plungers operating vertically and in line with each other, whereby I have the advantage of the series for line or continuous splitting off of the ice instead of breaking in mass.

ZACHARIAH ORAM.

Witnesses:

H. T. WELLS,
P. C. BUDD.