

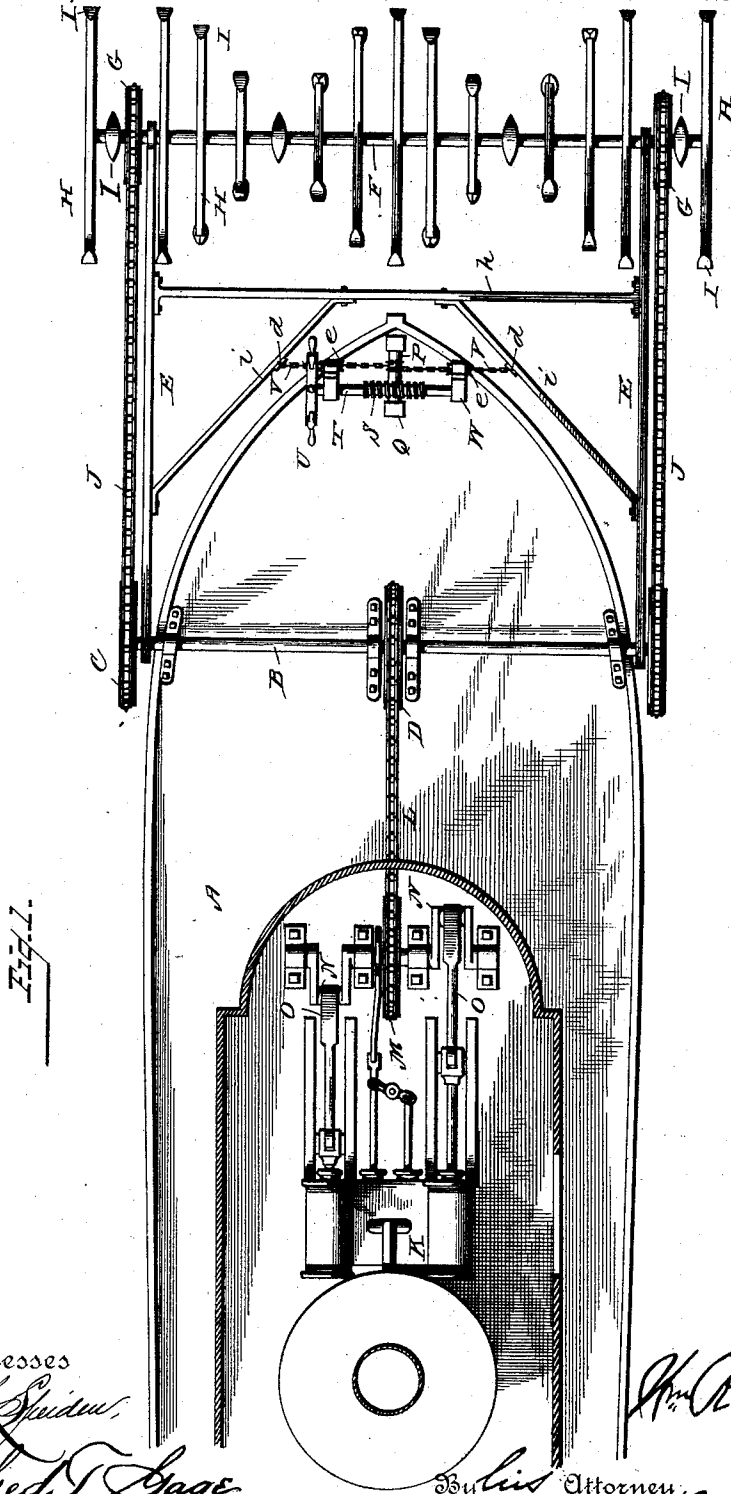
(No Model.)

2 Sheets—Sheet 1.

W. R. SCHOOLEY.
ICE BREAKING BOAT.

No. 374,205.

Patented Dec. 6, 1887.



Witnesses

Wm. Spence

Alfred T. Sage

Inventor

W. R. Schooley

By *his* Attorney

Wm. Henderson

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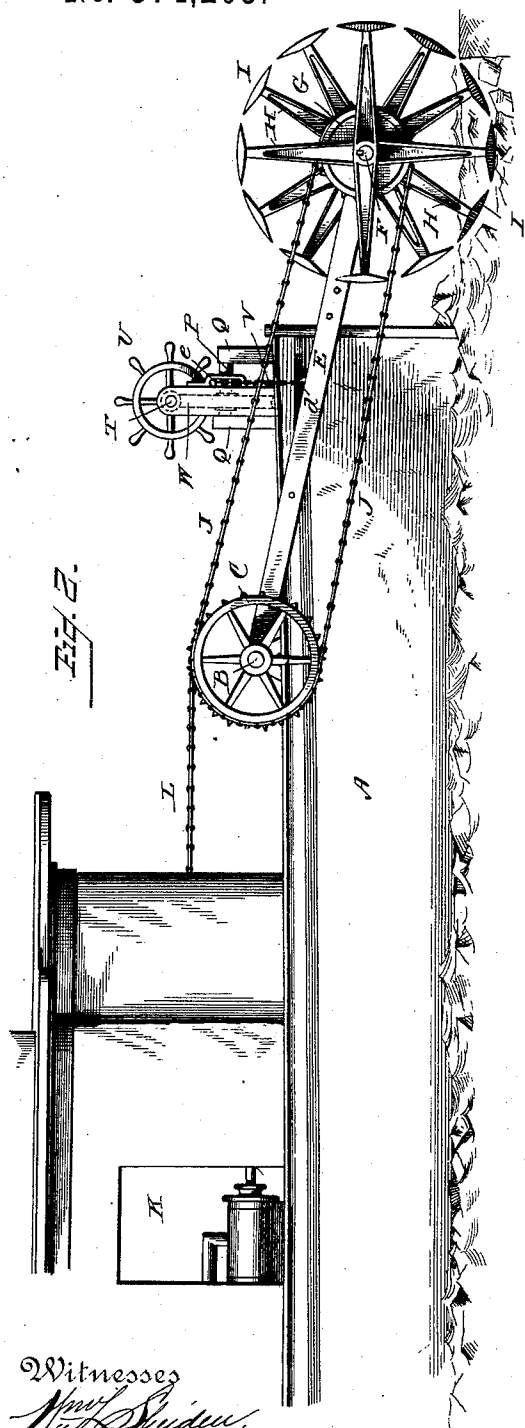


Fig. 2.

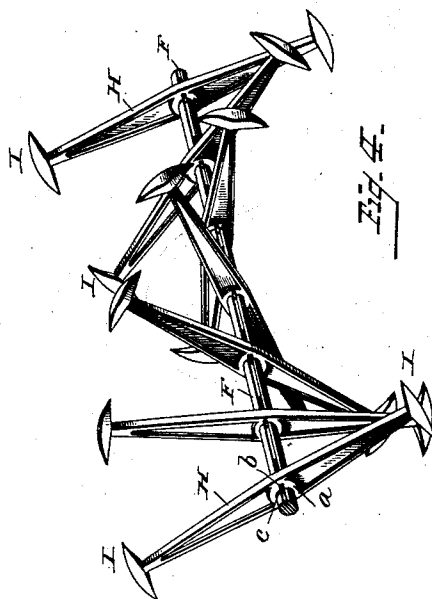


Fig. 4.

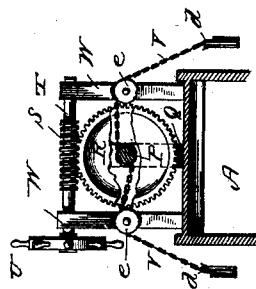


Fig. 3.

Witnesses
Wm. S. Spudis,
Alfred T. Gage.

Inventor
Wm. R. Schooley,
By his Attorney
Wm. Henderson.

UNITED STATES PATENT OFFICE.

WILLIAM R. SCHOOLEY, OF TRENTON, NEW JERSEY.

ICE-BREAKING BOAT.

SPECIFICATION forming part of Letters Patent No. 374,205, dated December 6, 1887.

Application filed June 16, 1887. Serial No. 241,547. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. SCHOOLEY, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Ice-Boats; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to ice-boats, and has for its object to construct a boat which will expeditiously and thoroughly break up the ice in rivers and harbors and other bodies of water to open up navigation, the construction of the parts being such that they are strong and comparatively inexpensive, and which can be readily applied to boats or crafts without specially constructing the craft for the application of the breaker thereto.

To the accomplishment of the foregoing ends the invention consists in the construction and the combination of parts hereinafter particularly described, and then specifically defined by the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a plan of the boat, showing engine-room in horizontal section. Fig. 2 is a side elevation of the boat. Fig. 3 is a detail of lifting mechanism. Fig. 4 is a perspective of the breakers.

In the drawings, the letter A designates a boat, which may be of any ordinary and well-known construction. To a suitable part thereof, say to the bow portion, there is journaled in suitable bearings a shaft, B, which has on each end, and, say, outside or beyond the sides of the vessel, a pulley or wheel, C, and between its ends a pulley or wheel, D. To the same shaft are secured, in manner to turn or swing thereon, the arms or bars E, which carry at their forward or free ends a shaft, F, which is journaled so as to revolve. This shaft has keyed to it the wheels or pulleys G, and between its ends is provided with a series of arms, H, arranged around the shaft in a man-

ner that they will be out of line with each other, as indicated in Fig. 4. These arms are each formed of flanged or double T-iron, and taper toward both ends, and are formed with a hole, *a*, between the ends, in which hole is formed a seat, *b*, to receive a key, so that when the arm is slipped over the shaft it may be secured thereto by a key, *c*, thus firmly and rigidly securing the arm to the shaft. Each arm is also provided at each end with a pick or tooth, I, which preferably projects from both faces of the arm. By the construction of arm described I obtain comparative lightness combined with strength, and at the same time have the picks set at such a position and distance apart that they will effectually break the ice and permit it to pass off without choking the arms. A belt or chain, J, will connect the pulleys C and G, so that power may be transmitted from shaft B to shaft F to revolve the latter. The shaft B derives motion from an engine, K, located at any convenient part of the vessel, through a suitable connection—say a chain or band, L—between pulley D and a pulley or wheel, M, on a double-crank shaft, N, which connects with the engine through the pitman-rods O.

When the breaker is operating, the parts are in the position shown in Fig. 1, and when not being operated the shaft carrying the pick-arms is raised and supported by suitable means above the bow of the boat. The means I consider best for the purpose consist of a shaft, P, journaled in suitable supports, Q, on the bow of the boat and provided with a cog-wheel, R, with which engages a worm, S, on a shaft, T, which may have a hand-wheel, U, for operating it. Ropes or chains V pass around shaft P, and at their other ends connect by suitable means—say by hooks *d*—with the swinging arms E, the ropes or chains passing over pulleys *e*, journaled in the upper ends of the standards W. By turning the worm-shaft the ropes or chains will be wound upon the shaft P, so as to lift the swinging arms and breakers carried at the end thereof.

The arms or breakers may be supported in their raised position by any suitable means—for instance, a ratchet, *f*, on shaft P—and a pawl, *g*, engaging therewith will hold the shaft P at any desired point, and thus hold the arms

at the desired elevation. The swinging arms may be braced and strengthened by a cross-bar, *h*, braced by diagonal arms *i*.

It will be observed that a set of the arms H lie at each end outside of pulleys G, so as to make a wide channel for the boat and keep the pulleys from coming against solid ice.

The construction and arrangement of parts as I have described them constitute a simple and strong structure, very efficient for the purpose intended, and comparatively inexpensive.

Great power can be transmitted to the revolving breakers or pick-arms, so as to revolve them with sufficient force to quickly break up the ice, and without strain upon the boat.

It is obvious that some parts of the invention can be used in connection with other parts constructed differently from what is shown, and yet be embraced within my invention; so that it will be understood that while I have described what I consider the best means for carrying out my invention, still I do not wish to be confined to all the particular details shown and described, except as specified in the following claims.

Having described my invention and set forth its merits, what I claim is—

1. The combination, with a boat and a shaft, F, of a series of arms composed of flanged iron having each an opening for the passage of the shaft and provided with picks or heads at their ends, and means connecting said shaft with the boat, substantially as and for the purposes described.

2. The combination, with a boat and a shaft, F, carrying a series of breaker-arms, of a shaft, B, hinged arms E, carrying the shaft F at their free ends, means connecting the two shafts to transmit motion from one to the other, a wheel, D, on shaft B, a double-crank shaft, N, carrying a wheel, M, means connecting wheels D and M, and pitman-rods for connecting the crank-shaft with an engine, substantially as and for the purposes set forth.

3. The combination, with a boat and a shaft, F, carrying a series of breaker-arms, of a shaft, B, provided with a wheel, D, and connected with shaft F to transmit motion thereto, the arms E, hinged to the same shaft that carries wheel D and carrying at their free ends the shaft F, and an engine connected by intermediate means with wheel D, to revolve shaft B, substantially as and for the purposes set forth.

4. The combination, with a boat, of arms E, hinged thereto and carrying a series of breaker-arms at their free ends, a shaft, P, provided with a cog-wheel, R, a worm-shaft, S, engaging with said wheel, and ropes V, connecting at one end to said shaft P and running in opposite directions, and connecting at the other end to arms E, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM R. SCHOOLEY.

Witnesses:

GEORGE W. MACPHERSON,
JAMES M. FORCE.