

D. C. GRANT.

Ice-Plow and Ram-Attachments for Vessels.

No. 151,774.

Patented June 9, 1874.

Fig: 1.

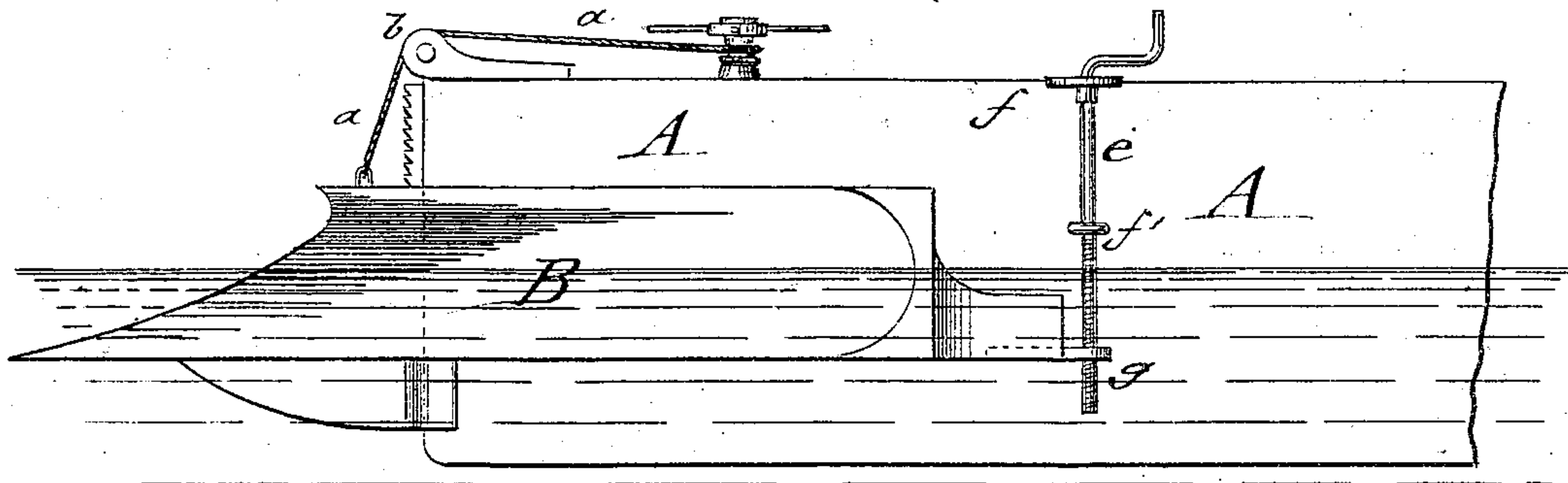


Fig: 2.

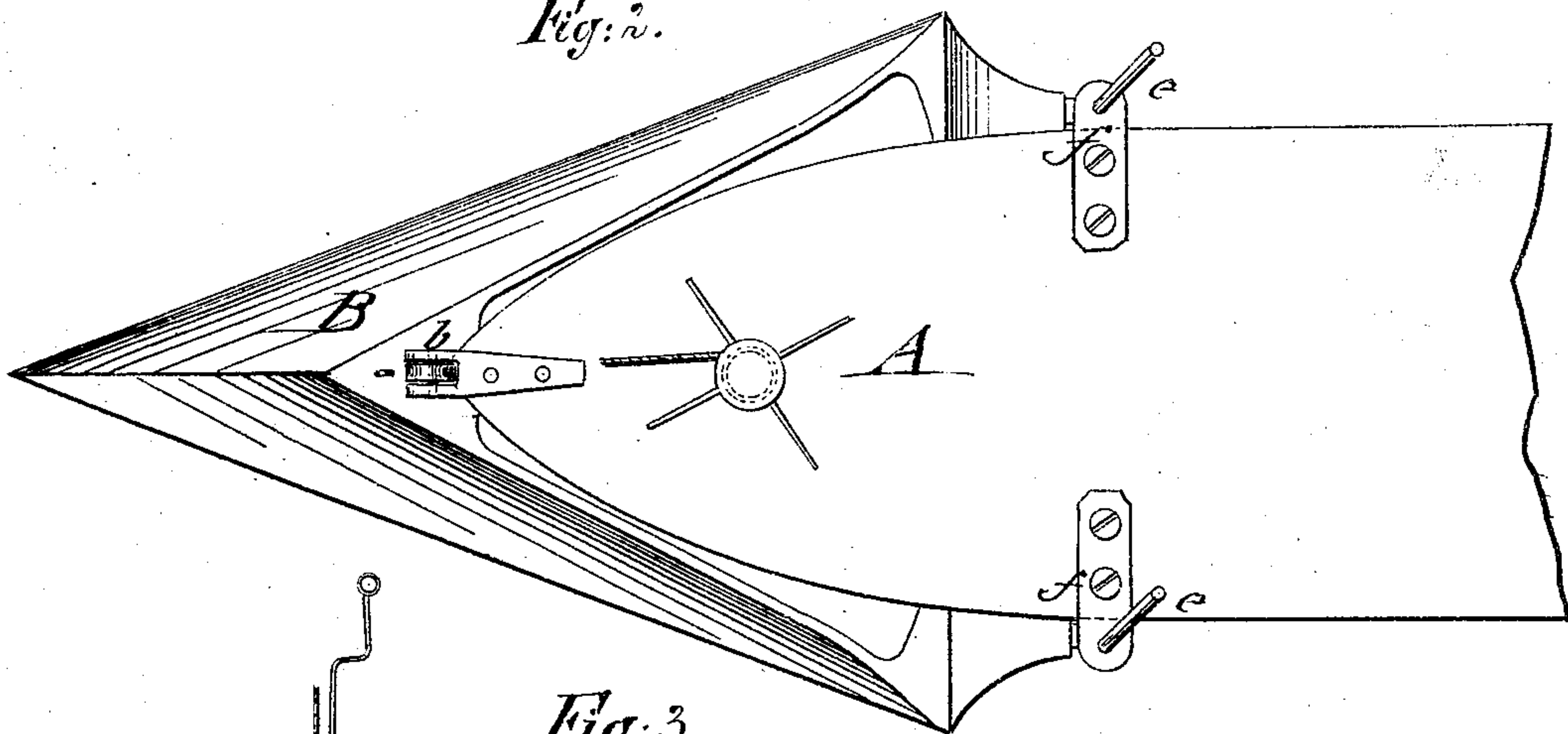


Fig: 3.

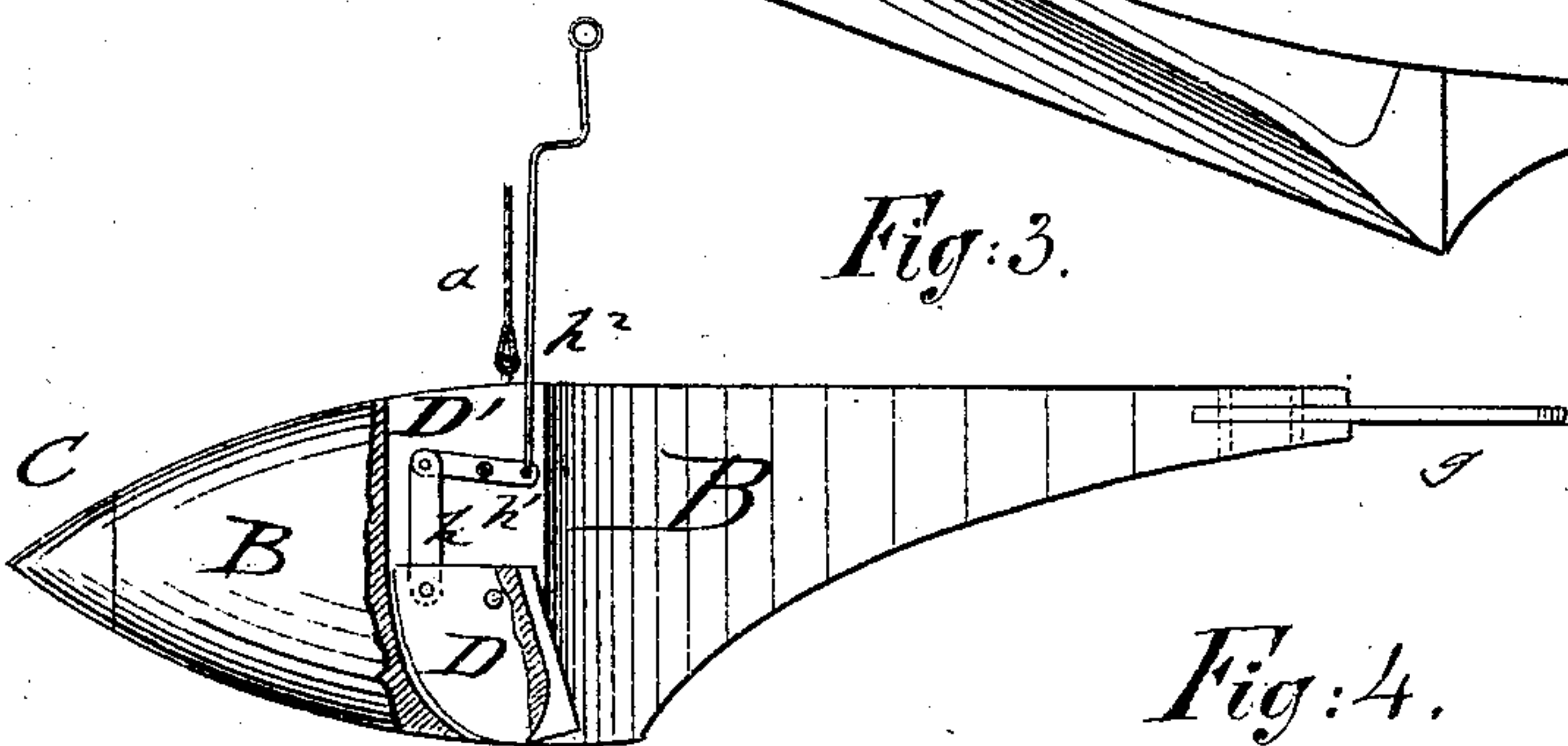
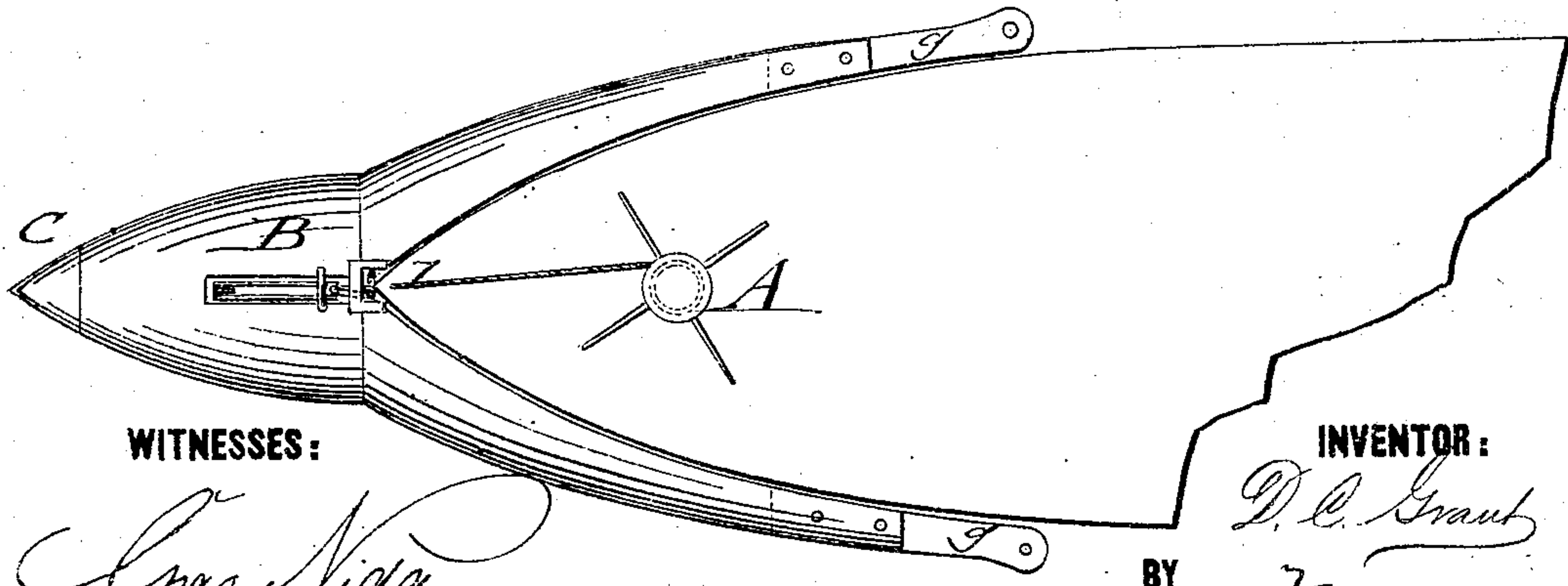


Fig: 4.



WITNESSES:

Chas. Nida.
Chelguier

INVENTOR:

D. C. Grant

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

D. CONRAD GRANT, OF HOUGHTON, MICHIGAN.

IMPROVEMENT IN ICE-PLOWS AND RAM ATTACHMENTS FOR VESSELS.

Specification forming part of Letters Patent No. 151,774, dated June 9, 1874; application filed March 28, 1874.

To all whom it may concern:

Be it known that I, D. CONRAD GRANT, of Houghton, in the county of Houghton and State of Michigan, have invented a new and Improved Ice-Plow and Ram Attachment to Vessels, of which the following is a specification:

In the accompanying drawing, Figures 1 and 2, respectively, represent side and top views of my improved ice-plow attachment to vessels; and Figs. 3 and 4, respectively, are sectional side and top views of the ram modification of the same.

Similar letters of reference indicate corresponding parts.

The invention will first be fully described, and then pointed out in the claim.

In the drawing, A represents a vessel; B, the plow or ram attachment applied to the stem of the same. The plow or ram B is constructed either with a pointed, inclined, or rounded front part or prow, being then bifurcated to fit exactly the shape of the stem of the vessel, extending backward along the same to some convenient distance from the stem-post.

For the purpose of stowing away the plow or ram when not in use the same is made of two longitudinal halves, which are firmly connected in suitable manner before being attached to the vessel.

Plow or ram B is adjusted by means of a cable, *a*, which is applied to it in front of the stem-post, and then passed over a pulley, *b*, on the top of the same to a capstan, being wound around the same for raising or lowering thereby the front part.

The ends of the bifurcated part of plow B are raised or lowered by strong screw-bolts *e*, which are worked in supporting-brackets *f'* by suitable hand-cranks, guided in staples *f''*, screwed, preferably, in swivel-nuts *g* of the plow ends. The whole plow or ram attachment is thus easily adjusted from the deck of the boat.

When the plow or ram is used for breaking the ice in front of the vessel, the point and lower edge are run under the ice, by which

the same is broken, and carried back along the inclined plane of the plow, being thrown either over or under the undisturbed part of the ice, leaving a clear track for the vessel.

The ram-shaped attachment B may be provided, at the outermost point, with a suitable recess, into which a powder-charge, shot, or torpedo, C, may be fitted, to be discharged either by a galvanic battery, or by concussion. It may be used for breaking heavy masses of ice which are not penetrable by the plow and the power of the vessel, and also, in times of war, for the purpose of destroying the vessels of the enemy. The plow or ram may be also so adjusted for more effective work that the point is raised above the rear part, which is placed under suitable inclination.

The exact fitting of the plow or ram to the stem-post is then produced by a grooved cam, D, which is pivoted into a curved recess, D', of the ram. The grooved end of cam D fits closely over the edge of the stem-post, while its rounded-off end slides along the curved recess D', as shown in Fig. 3.

The position of the cam D is changed to suit the inclination of the ram attachment by means of a lever-rod, *h*, pivoted near the front part of the cam-lever *h'*, fulcrumed into the recess, and regulated by a rod, *h''*, with handle end, which reaches up to the deck, and is firmly set, by a shoulder bend of the same, into the teeth of a rack or ratchet, *l*, of the stem-post.

A firm and intimate seating of the front part of the plow or ram on the stem of the vessel under its different inclinations is produced, by which the work of the same under the ice is greatly expedited, and its effect augmented.

The suitable inclination of the ram allows, in attacking a vessel, the almost vertical striking of the hull, so as to cause thereby greater damage to the same, as in the present rams, which strike the hull under an oblique angle, and do comparatively little harm, as the prow glances off and neutralizes the effect of the stroke by merely contusing and hoisting the

vessel. Vessels are, in this manner, easily armed with a very effective weapon, to be used at any time, either as protection against the ice, or as a formidable means of attack.

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

The plow or ram B, having recess B', in

combination with adjustable grooved cam D and the stem-post, for producing any suitable inclination of the plow or ram attachment, as described.

D. CONRAD GRANT.

Witnesses:

C. E. RAYMOND,
J. W. RAYMOND.