

No. 620,344.

Patented Feb. 28, 1899.

O. MÖLBACH.

APPARATUS FOR CLEARING CHANNELS OF BROKEN ICE.

(Application filed July 30, 1898.)

(No Model.)

Fig. 2.

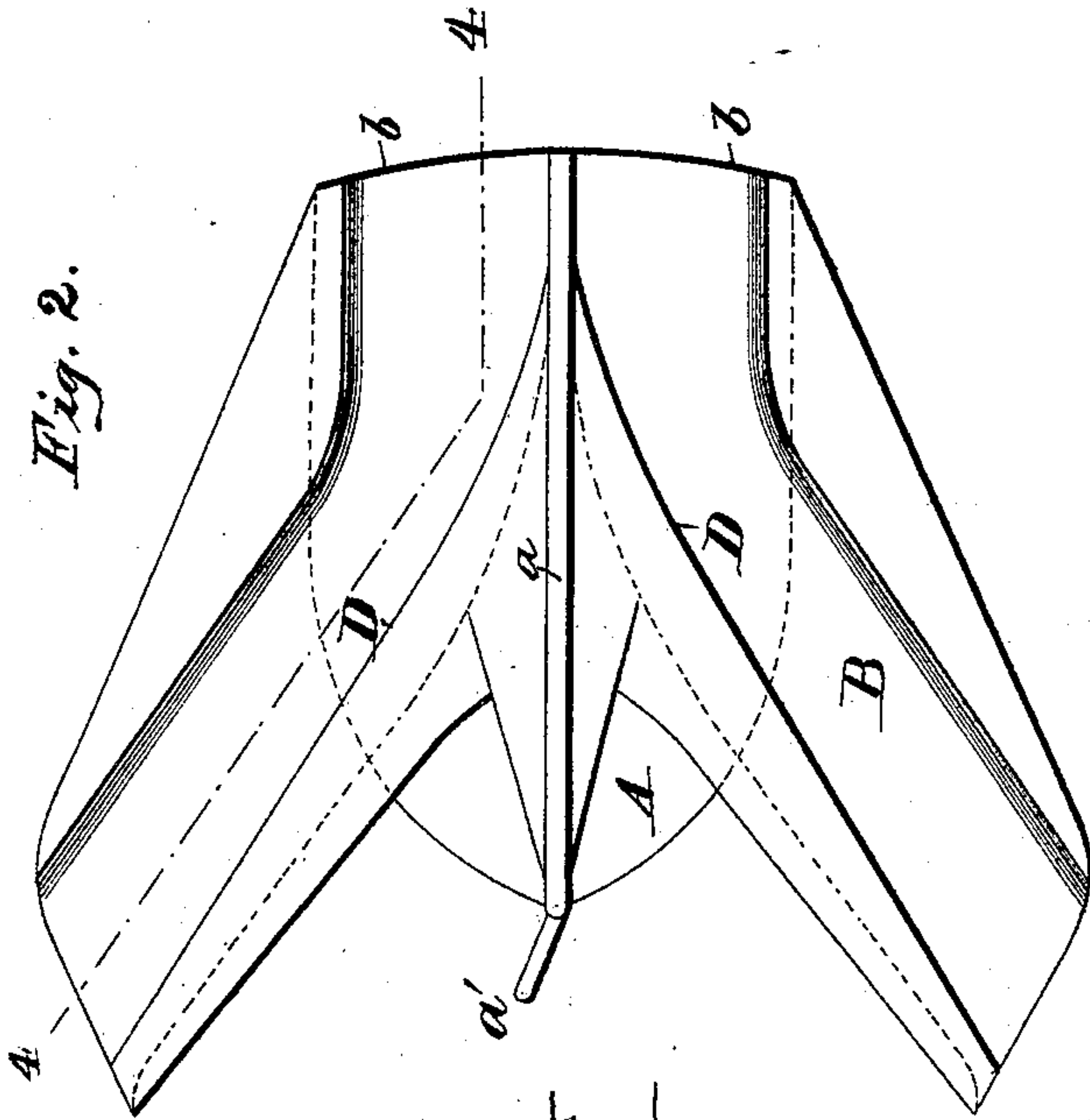


Fig. 4.

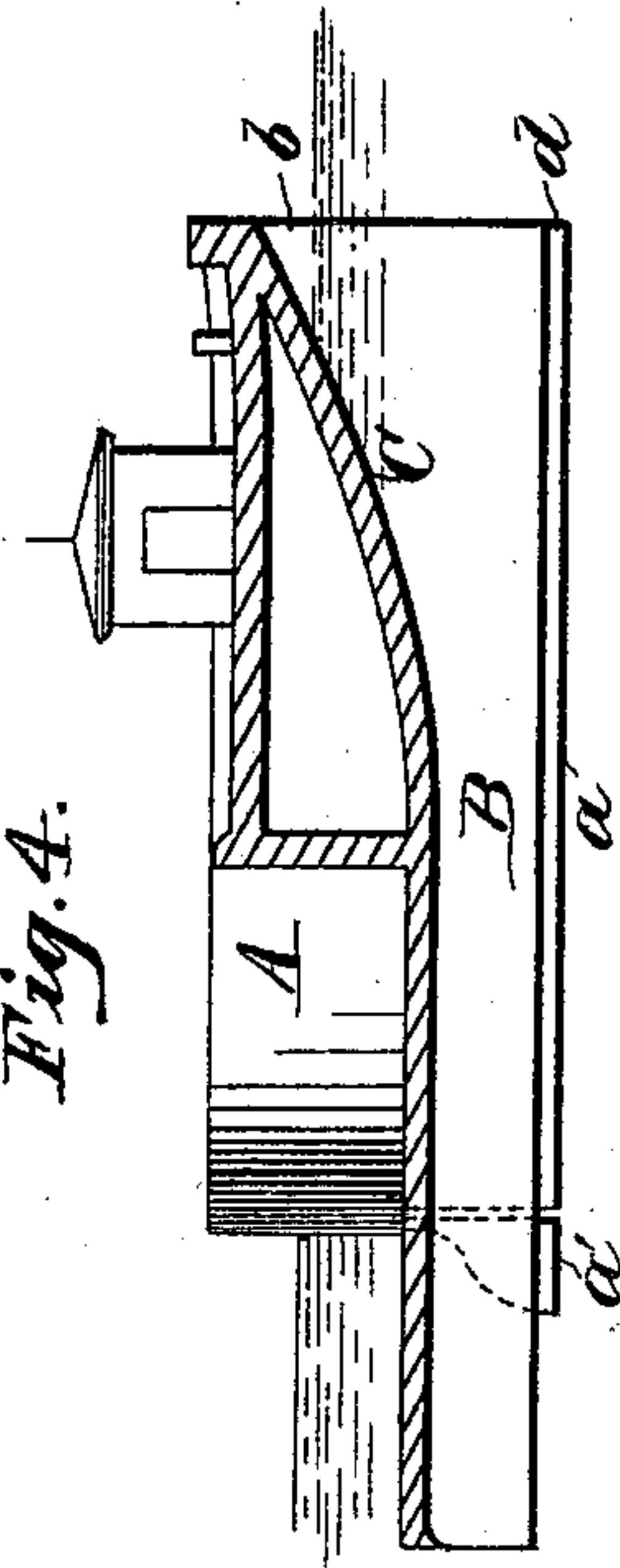


Fig. 3.

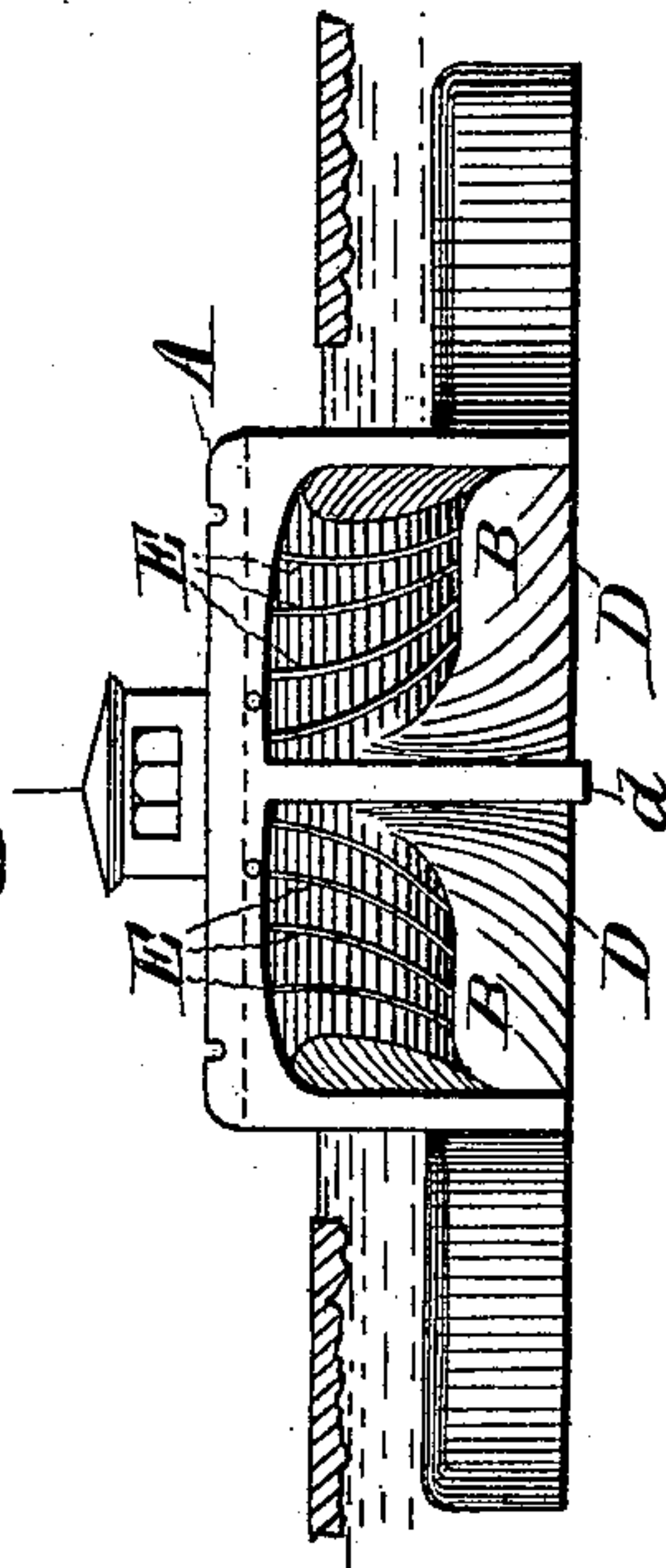
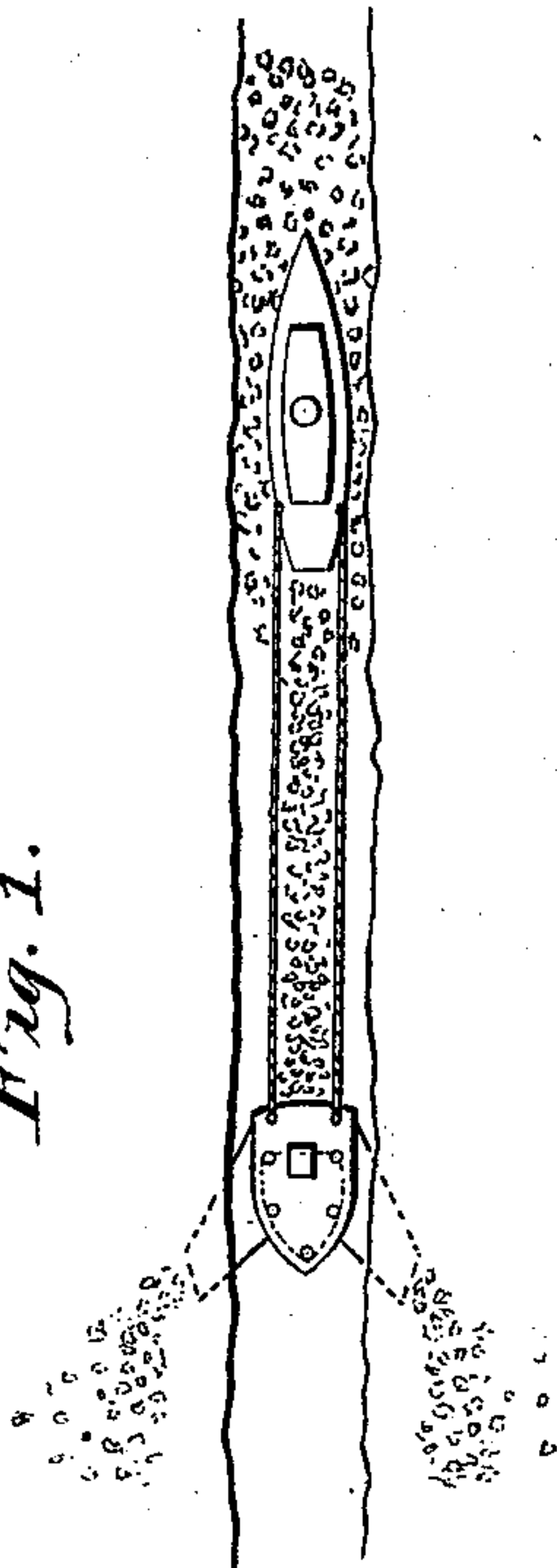


Fig. 1.



Witnesses:
R. W. Sommers,
M. J. L. Higgins.

Inventor:
Oluf Mölbach
by *Newy Orth* atty.

UNITED STATES PATENT OFFICE.

OLUF MÖLBACH, OF CHRISTIANIA, NORWAY.

APPARATUS FOR CLEARING CHANNELS OF BROKEN ICE.

SPECIFICATION forming part of Letters Patent No. 620,344, dated February 28, 1899.

Application filed July 30, 1898. Serial No. 687,305. (No model.)

To all whom it may concern:

Be it known that I, OLUF MÖLBACH, a subject of the King of Sweden and Norway, and a resident of Christiania, Norway, have invented certain new and useful Improvements in Apparatuses for Bringing Away Broken Ice from Ice-Channels; and I do hereby 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to means for clearing channels which have been previously cut in ice which covers rivers or other waterways, and has for its object the collection of the floating pieces and means for discharging them again under the sheet-ice on either side of the cut, so as to leave the channel perfectly clear for the travel of small craft without danger of injury by collision with floating ice cakes. Apparatus heretofore designed for this purpose have proven unsatisfactory, because they were too complicated in their construction and because they did not prevent the wedging of floating ice between the device and the ice sheet on the edge of the channel, thus rendering progress very difficult.

When a steamer passes through a channel which has been cut through the ice, the floating cakes tend to collect in the center of the channel or wake of the steamer, and it is this feature that I make use of in rendering my invention more effective, which invention will now be described in detail, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which like letters of reference refer to like parts.

Figure 1 is schematic drawing, showing my device dragged by a towboat. Fig. 2 is an under side view. Fig. 3 is a front elevation, and Fig. 4 is a section on line 4 4 of Fig. 2.

It will be seen that my device consists, essentially, of two channels B, which may or may not be open on their under side, having enlarged or flaring entrances *b* projecting above the surface of the water. These channels B are separated in front by a stout stem

or partition *d*, which is prolonged toward the rear, forming the keel *a* of the device, at the end of which is attached the usual rudder *a'*. The channels run parallel for a short distance, during which they have a uniform cross-section, and then diverge on either side of the body portion A, at the same time leading below the surface of the water and increasing in width from the point at which they begin to diverge. The increase in width of the channels toward the rear enables a ready discharge and prevents jamming of the entering ice.

In order to prevent any liability of the ice running under the rear or inner edges of the channels when open-bottomed channels are used, I bend the edge D in toward the center, as shown clearly in Fig. 2, the dotted lines indicating the channel-wall.

On the inclined or curved descending top wall C, I provide rails or conducting-strips E, which enable the cakes of ice to readily pass through the channels while riding upon them. I may place similar rails E on the side walls of large machines for the same purpose.

I have found that a convenient and effective size is such that the width of the body portion A will be about two-thirds the width of the channel cut in the ice, while the diverging channels should be of sufficient length to project under the edges of the ice on either side of the channel.

The operation is as follows: The device is towed by a tug by two hawsers whose ends are fastened on the front of the channel-clearer as far apart as practicable. The ice cakes tending to collect in the wake of the tug enter the flaring mouths of the channels, and by reason of the motion of the device are forced through the channels with the inclosed water and at the same time forced below the surface, the rails E making it much easier for the cakes to slip through. They are thus deposited beneath the sheet of ice on either side of the channel and are held against its under surface by their buoyancy.

The apparatus is constructed of wood, well strengthened by iron, or may be made entirely of iron and self-propelled, if desired.

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

1. A device for clearing waterways, cut through ice, of floating cakes, which consists of diverging channels provided with depending sides and entrances projecting above the surface of the ice, adapted to collect the floating cakes and discharge them from the ends of said channels beneath the ice bed, substantially as described.

2. A device for clearing waterways, cut through ice, of floating cakes, which consists of submerged diverging channels, provided with depending sides and entrances projecting above the surface of the ice adapted to collect the floating cakes and discharge them from the ends of said channels beneath the ice bed, substantially as described.

3. A device for clearing waterways, cut through ice, of floating cakes, which consists of submerged diverging channels provided with curved side walls, submerged below the ice bed and provided with entrances projecting above the surface of the ice and adapted to collect the floating ice cakes and discharge them from the ends of the channels beneath the ice bed, substantially as described.

4. A device for clearing waterways, cut through ice, of floating cakes, which consists of submerged diverging channels, side walls therefor and flaring entrances projecting above the surface of the ice and adapted to collect the floating ice cakes and discharge the same from the ends of said channels beneath the ice bed, substantially as described.

5. A device for clearing waterways, cut

through ice, of floating cakes, which consists of one or more diverging channels open on their under side, the inner or rear wall thereof bent inward toward the center, rails on one or more of the walls of said channels, and an entrance projecting above the surface of the ice, substantially as and for the purpose set forth.

6. A device for clearing waterways, cut through ice, of floating cakes, which consists of a body portion A, one or more diverging channels open on their under side, the inner or rear wall thereof bent inward toward the center, rails on one or more of the walls of said channels, and an entrance projecting above the surface of the ice, substantially as described.

7. A device for clearing waterways, cut through ice, of floating cakes, which consists of two downwardly-inclined diverging channels, flaring entrances thereto, and enlarged exits therefrom, said channels parallel for a short distance from their entrance, and a body portion A located between said channels, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

OLUF MÖLBACH.

Witnesses:

HENRY BORDEWICH,
ALFRED J. BRYN.