

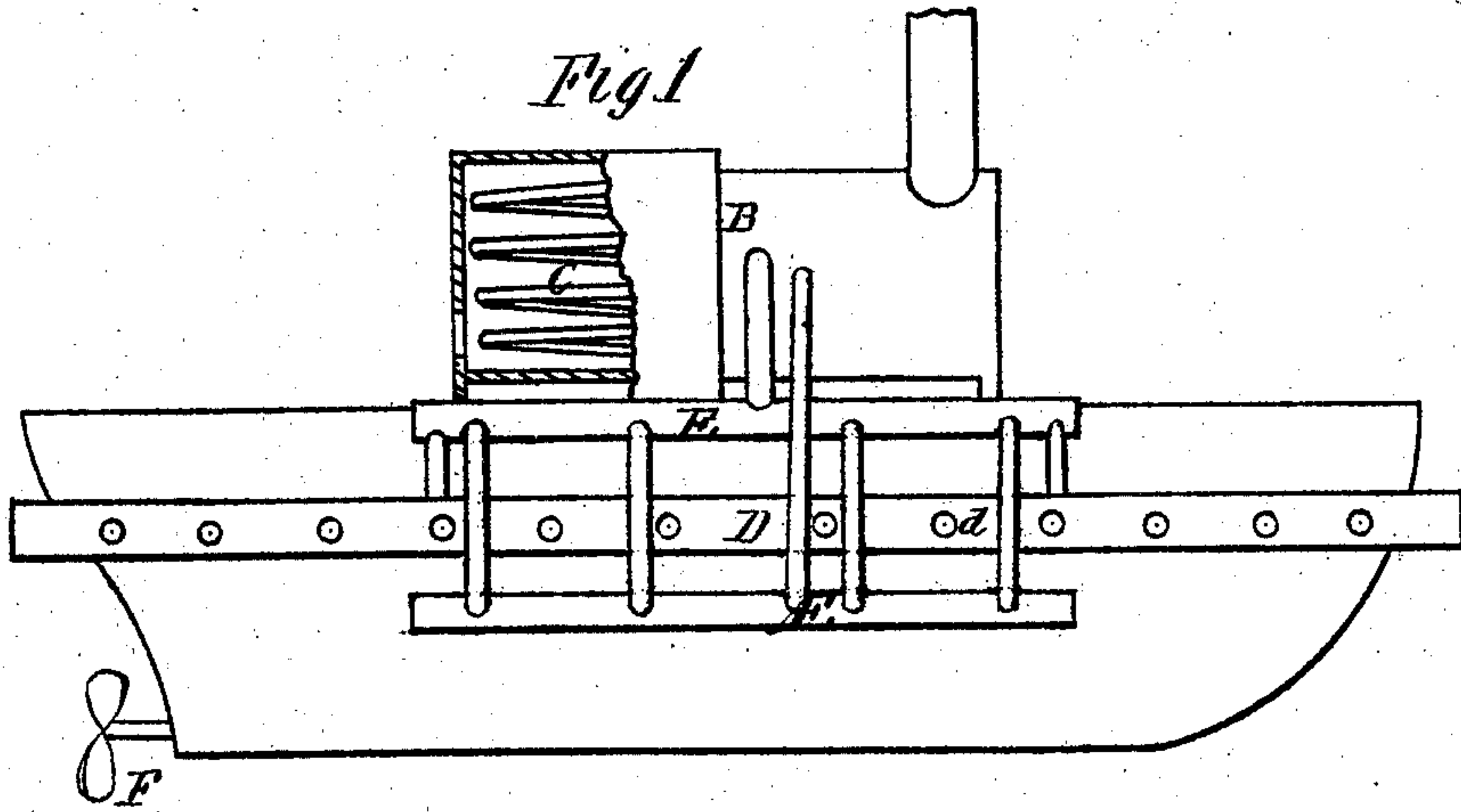
2 Sheets--Sheet 1.

J. MULLALY.

Means of Keeping Open the Navigation of Canals, &c.

No. 143,833.

Patented Oct. 21, 1873.



Witnesses.
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A. Connolly

Inventor
John Mullaly
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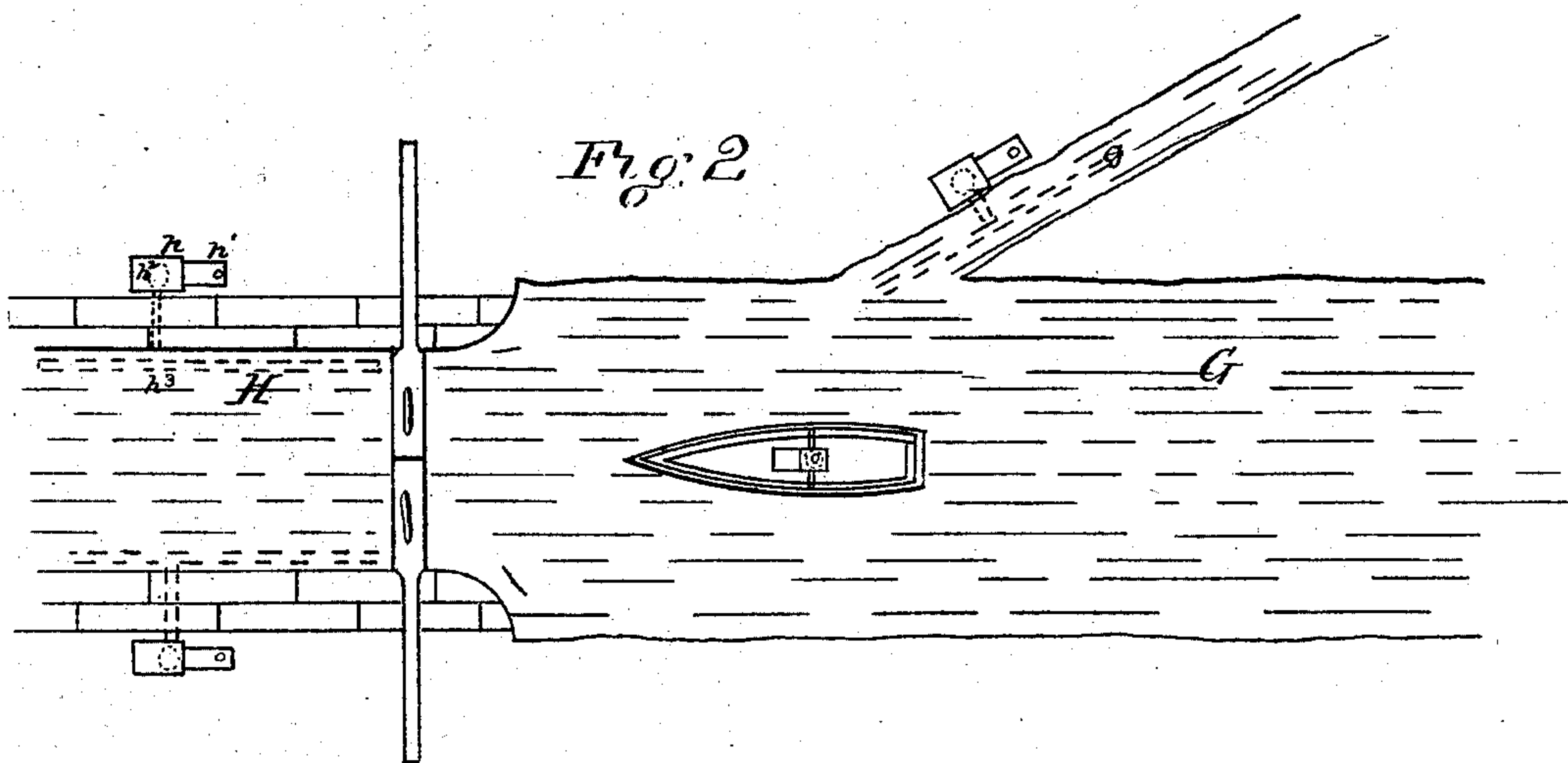
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UNITED STATES PATENT OFFICE.

JOHN MULLALY, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MEANS OF KEEPING OPEN THE NAVIGATION OF CANALS, &c.

Specification forming part of Letters Patent No. **143,833**, dated October 21, 1873; application filed April 11, 1873.

To all whom it may concern:

Be it known that I, JOHN MULLALY, of New York, in the county of New York and State of New York, have invented a certain new and useful Method and Means for Keeping Open the Navigation of Rivers and Canals; and 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

In the drawings, Figure 1 is a side view of the vessel carrying the heating and steam-discharging apparatus. Fig. 2 is a plan view of a canal having apparatus located at different points to prevent freezing.

My invention has for its object to prevent the closing of navigation on rivers and canals by the formation of ice in cold weather; and the method by which I achieve this result is by raising the temperature of the water in the rivers and canals by artificial heat, and keeping it above the freezing-point.

The principal means by which the necessary heat is to be thus imparted is a floating vessel of suitable construction, provided with a furnace and appurtenances for generating and superheating steam, and discharging the same into or upon the surface of the water, or beneath or upon the ice should ice be formed. In addition to the pipes or other devices for ejecting the steam, as aforesaid, radiating pipes heated by steam are to be employed, located on the sides of the vessel, both above and below the water-line. The device for discharging the superheated steam may be either a tank or chamber having orifices or open projections for the exit of the steam, or pipes with suitable perforations or open projections may be employed. The size of the vessel may be varied to suit circumstances. For canals of ordinary width the vessel might advantageously be made wide enough to extend almost from bank to bank, and side sluices or locks should be arranged at suitable intervals, into which the vessel would be guided to pass boats coming in an opposite direction. The vessel could be either towed, as canal-boats usually are, or might be furnished with suitable appliances for the purpose of obtaining propelling

power on board. The number of boats necessary to keep navigation open must of necessity depend upon circumstances, the size of the vessels themselves, the power of the steam-generating apparatus, the condition of the weather, &c.; but, as a rule, it would not, I think, be necessary to have more than one vessel for, say, every fifteen or twenty miles of a canal.

I propose, furthermore, at locks, or at points where the supply of water enters the canal, to employ superheated-steam apparatus of capacity sufficient to keep constantly warm the supply as it enters the canal, thereby aiding the floating superheaters.

The number of vessels necessary to keep navigation open on rivers will depend in a great measure on the size of the stream, and other natural conditions, which are so various that no general rule, applicable to all rivers, can be laid down. It may, however, be stated that, when it is only deemed necessary to keep a narrow channel open, said channel being about equal in width to an ordinary canal, one vessel every five miles might suffice to prevent the closing of said channel.

I do not suggest the employment of the stationary heaters on rivers, except in rare instances, as where the river is very narrow, and presents other natural conveniences for their use.

These improvements would serve to keep the water in the canal constantly above the freezing-point, and thereby prevent the formation of ice. If, however, from accident or other cause, ice should be allowed to form, it may be melted by the same means as those described for warming the water; but, if due care be exercised, the formation of ice, except, perhaps, in seasons of extraordinary severity, may be wholly prevented by the means described, the agitation of the water produced by the motion of the vessel serving as an auxiliary to the heating devices.

Referring to the accompanying drawing, which illustrates my invention, A is a vessel of suitable construction, provided with a furnace and boiler, B, for generating steam, and a superheater, C. D is a tank, receiving steam from the superheater, whence it is discharged, through orifices or open projections *d'*, into or

upon the surface of the water or ice, or both above and below the surface simultaneously. Instead of the tank, a series of pipes may be employed, the superheated steam being ejected from the ends of the pipes, or through suitable orifices or open projections in the sides thereof. In the drawing I have illustrated only a single furnace, with boiler and superheater, and one tank; but I do not limit myself thereto, reserving the right to use any greater number. E are the radiating pipes, arranged on the sides of the vessel, and receiving steam from the boiler or superheater. The arrangement of these pipes may be varied so long as the principle of radiation is adhered to, and the size or dimensions and number of the radiating pipes may be increased and lessened, according to circumstances.

I have illustrated a screw-propeller, F, to be moved by steam from the boiler; but any other power suitable for the purpose may be substituted therefor, the specific means for propulsion forming no part of this invention.

G represents a canal, with side sluices *g*; and H, a lock therein, having devices for heating the water, said devices consisting of a furnace, *h*, boiler *h*¹, superheater *h*², and superheating-tank or discharge-vessel *h*³, for which latter pipes may be substituted, as in the case of the floating superheater. At the different feeders along the line of the canal similar apparatus will be employed for the purpose of heating the water as it enters, and keeping it above the freezing-point.

The vessels may, under certain circumstances, be sufficient to keep the water up to the necessary temperature without the superheaters at the locks.

I am well aware that steam and other artificial heating mediums have been used for the purpose of melting ice and snow in various ways, not only on streets, but that the employment of artificial heat to keep open the navigation of canals has been suggested. I do not, therefore, claim, broadly, the employment of artificial heat for the purpose last mentioned; but

What I claim is—

1. A vessel provided with a furnace, boiler, superheater, and tank, or equivalent device, for discharging superheated steam into or upon the water of the river or canal, for the purpose of raising the temperature of the said water to prevent the formation of ice, as set forth.

2. A boat or movable water-vessel provided with a furnace or heater, and with external radiating pipes, arranged substantially as shown, to receive heat from said furnace or heater and diffuse it into or upon the water of a navigable stream for the purpose of keeping the navigation open, substantially as specified.

3. A boat or movable water-vessel provided with a furnace, steam-generator, and means for discharging steam into or upon the water in sufficient quantities to open or prevent the closing of navigation on canals or other navigable streams in winter, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of March, 1873.

JOHN MULLALY.

Witnesses:

WM. DENSMORE,
WM. J. HUGHES.