

G. W. RUSSELL.

Racks for Water Wheel Flumes.

No. 122,738.

Patented Jan. 16, 1872.

Fig. 1.

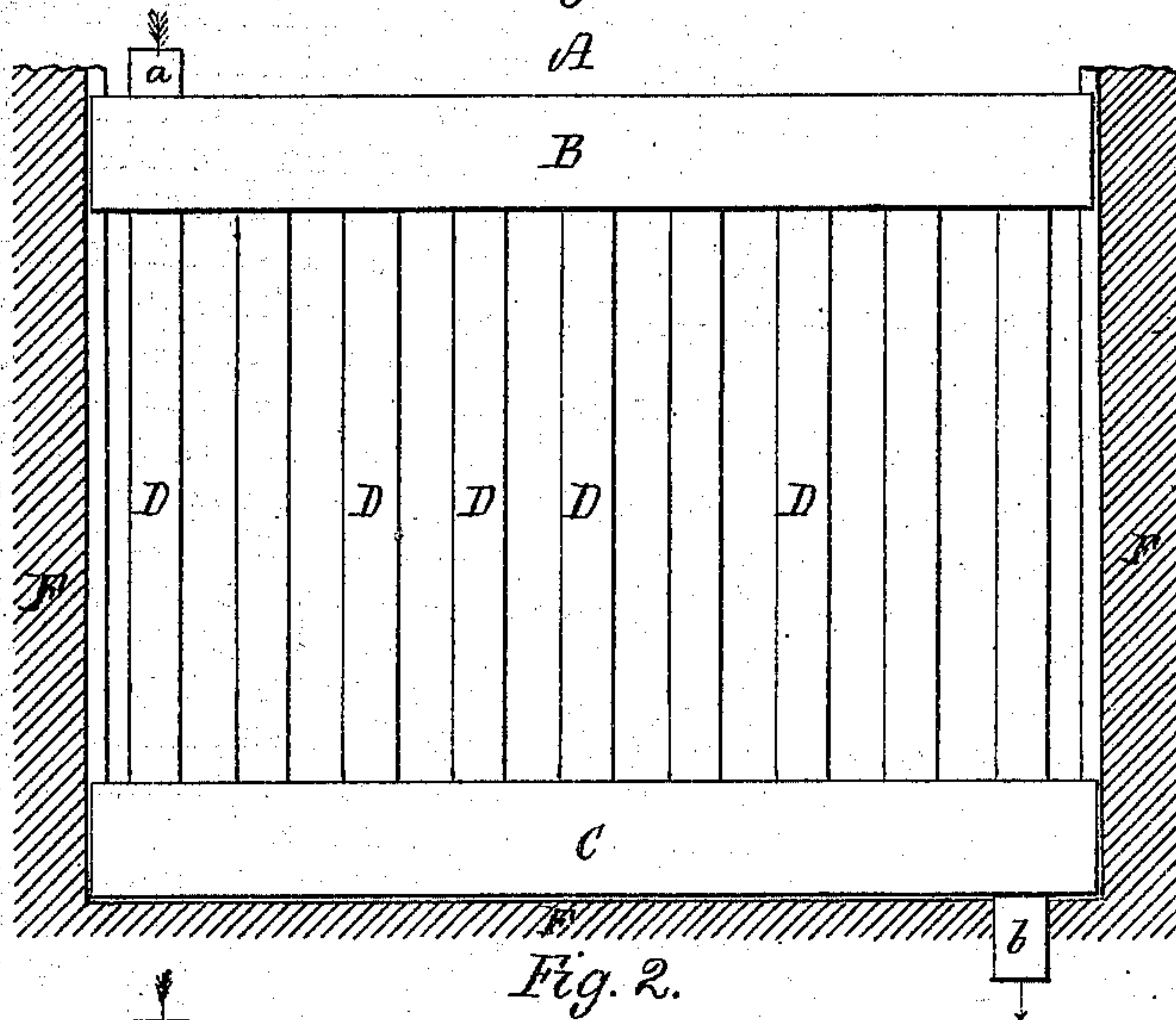
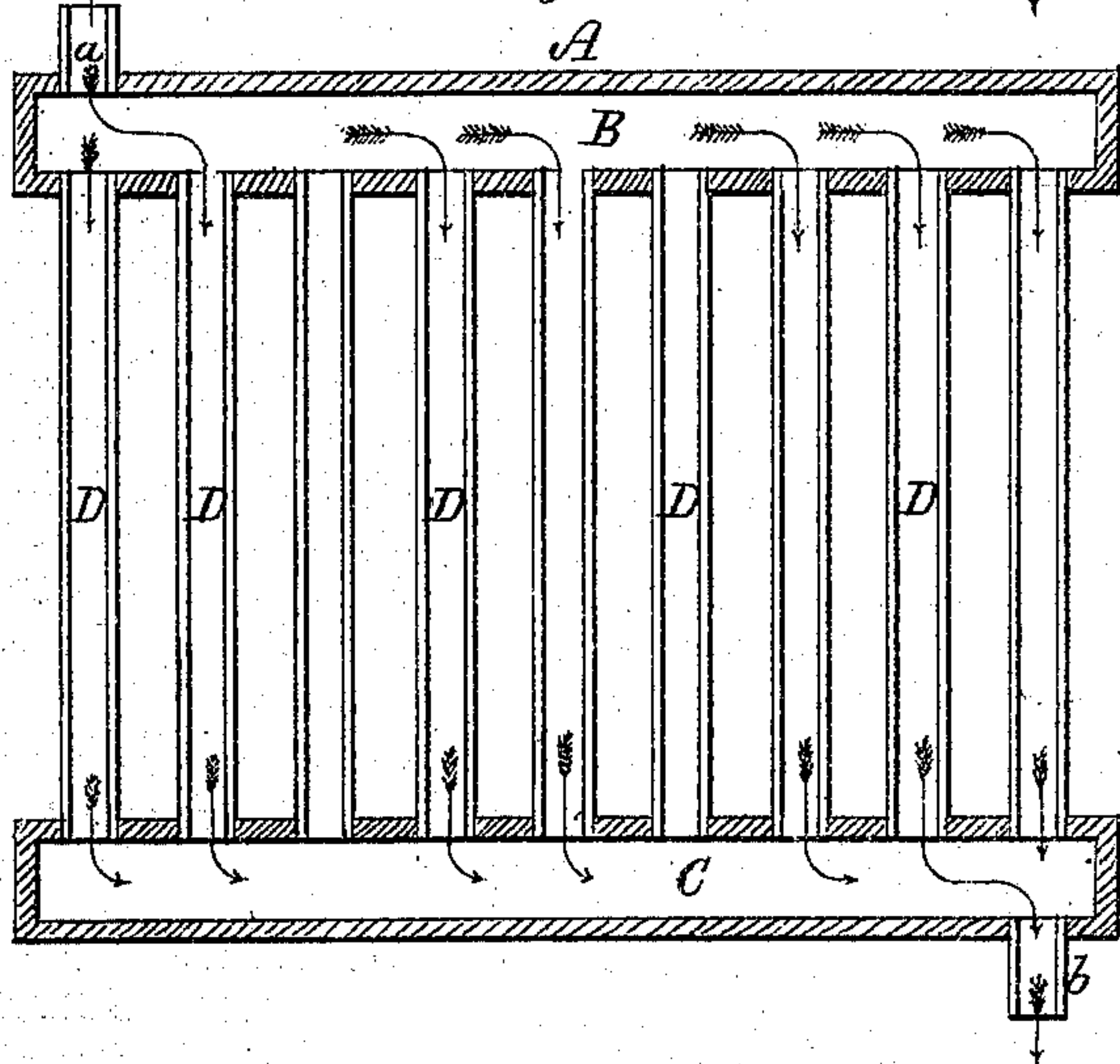


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN RACKS FOR WATER-WHEEL FLUMES.

Specification forming part of Letters Patent No. 122,738, dated January 16, 1872.

*To all to whom these presents may come:*

Be it known that I, GEORGE W. RUSSELL, of Lawrence, in the county of Essex and Commonwealth of Massachusetts, have made an invention of a new and useful Improvement in Screen or Rack for Water-Wheel Flumes; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawing making a part of this specification, and in which—

Figure 1 is an elevation, and Fig. 2 a vertical section of my invention.

Much trouble and expense are now experienced in winter, and more especially at night, by mill-owners, from the accumulation of ice, especially "anchor" ice, so called, about the bars of the racks generally in use for preventing passage of any obstructions to the water-wheels or the flumes leading thereto. Anchor ice consists of a comminuted mass of fine particles of a specific gravity about equal to that of water, and is altogether the most annoying and obstinate substance which is found in mill-streams, as it adheres to and clogs a rack, and prevents passage of water, and is very difficult to remove.

My present invention proposes to prevent this lodgment and accumulation of ice, or the formation of ice about the bars or interstices of a rack or grating; and to this end I employ a series or cluster of tubes whereof to construct the bars of the rack, these tubes having general and free communication one with the other, and the series containing provision for enabling a current of steam to enter or circulate through them, whereby their temperature is raised to a sufficient extent to prevent adhesion of ice and permit it to pass freely between them.

The drawing accompanying this specification represents at A a rack or grating to be placed at the head of a flume or chute leading to a water-wheel, the upper beam or rail of such rack being shown at B, its lower rail at C, and its upright bars at D D D, &c., the general visible arrangement and disposition of these parts

being as now generally in use, and the rack being arranged and secured in the flume or waterway F in the usual manner. In place, however, of solid bars of wood or iron, as have always heretofore been employed for the purpose, I construct the rails B and C tubular or hollow, and provide each with a steam part or orifice, *a* or *b*, as shown in Fig. 2. I also employ as bars a series of tubes which have open communication with the interior of the rails B and C, and, consequently, with each other, and so that a jet or current of steam which may be admitted to the uppermost part shall circulate throughout the whole, or sufficiently so to effect the desired result of increasing their temperature to such an extent as to prevent the adhesion or formation of ice about their external surfaces. I prefer that the bars D should be flat tubes placed edgewise to the stream to obtain strength and stiffness and large radiating-surface.

The advantages of my improvement will be apparent without further remark; but I might say that, upon the first trial, the mill provided with it was enabled to run the entire night, while others in the immediate vicinity were stopped.

The general disposition of the rails B and C and the bars D, &c., may be changed or modified considerably without departing from the spirit of my invention; as, for instance, a coil or zigzag pipe, properly supported, may be used with like results; and I do not confine myself to any given arrangement of parts; but

I claim as my invention—

A rack for water-wheel flumes, composed of a plurality of tubular bars, into or through which steam may be permitted to enter or circulate, for purposes stated, or a rack in which steam is employed, for purposes stated.

GEORGE W. RUSSELL.

Witnesses:

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(168)