

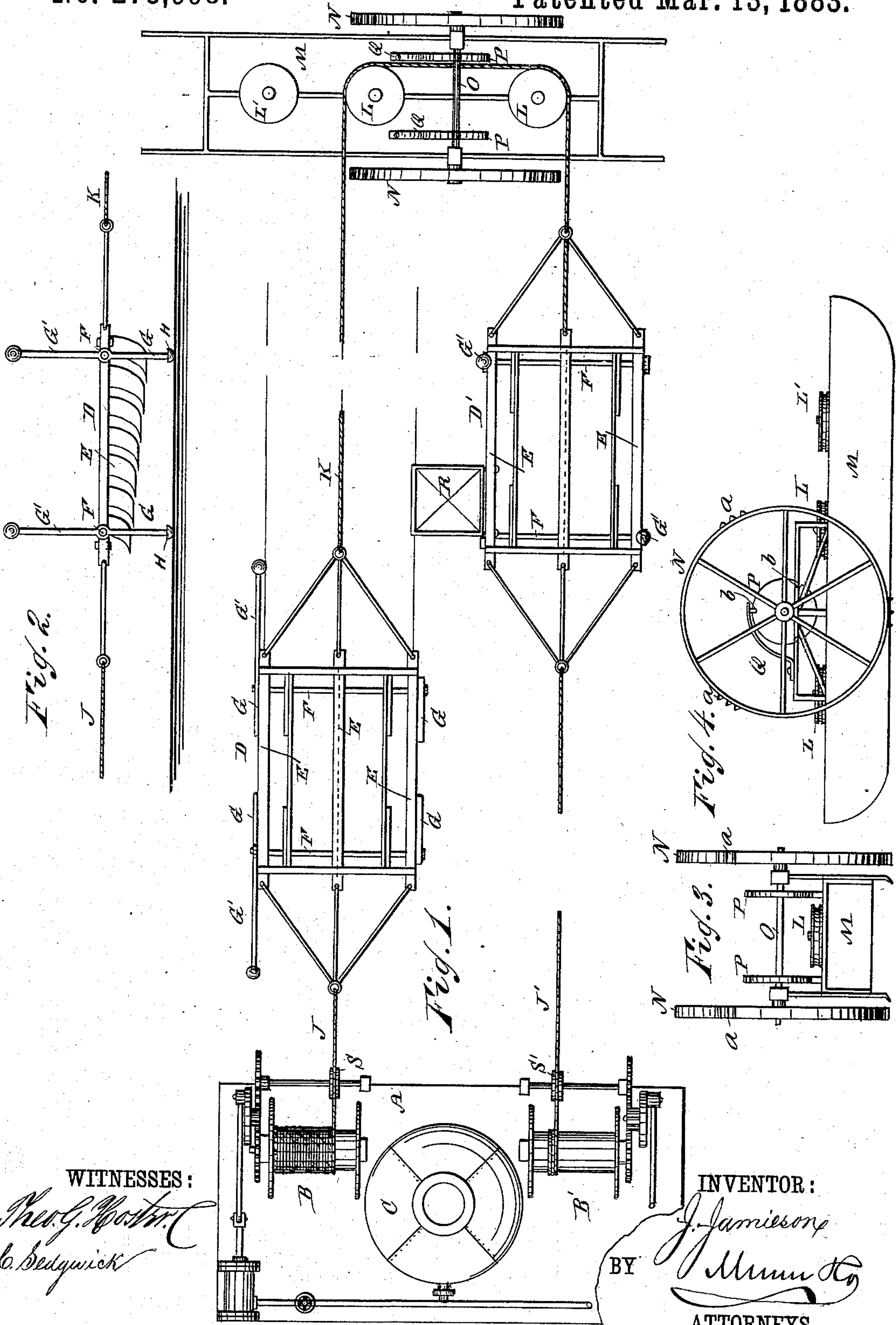
(No Model.)

J. JAMIESON.

STEAM ICE CUTTING MACHINE.

No. 273,998.

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WITNESSES:

Thos. G. Hooten
C. Beddick

INVENTOR:

BY *J. Jamieson*
Munn & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN JAMIESON, OF ROCKAWAY BEACH, NEW YORK.

STEAM ICE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 273,998, dated March 13, 1883.

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To all whom it may concern:

Be it known that I, JOHN JAMIESON, of Rockaway Beach, in the county of Queens and State of New York, have invented a new and
5 Improved Steam Ice-Cutting Machine, of which the following is a full, clear, and exact description.

The object of my invention is to provide a
10 new and improved machine for cutting a field of ice into blocks.

The invention consists in an ice-cutting machine formed of cutting-frames which are moved between two fixed sleighs on the field of ice which is to be cut.

15 The invention further consists in the combination, with the cutting-frames and the sleighs between which they are moved, of ropes which connect the rear ends of the cutter-frames and pass over the anchor-sleigh, and ropes which
20 connect the front ends of the cutter-frames with windlasses or other winding mechanism on the sleigh from which the cutters are moved.

The invention further consists in an anchor-sleigh carrying horizontal pulleys, and provided
25 with wheels having studs which catch in the ice and hold the anchor-sleigh in the desired position, which wheels can be locked in the desired position by suitable devices.

The invention also consists in a cutter-frame
30 carrying cutters, and provided with adjustable legs which can be raised to lift the cutters from the ice when the same are not to be used, which legs have half-balls or rounded blocks at their lower ends.

35 Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improved ice-cutting machine and the anchor-sleigh. Fig.
40 2 is a longitudinal elevation of the cutter-frame, showing the same raised from the ice. Fig. 3 is an end elevation of the anchor-sleigh. Fig. 4 is a longitudinal elevation of the same.

45 On the sleigh A, which is drawn on the ice to the place where the ice is to be cut, are mounted two windlasses, B and B', which are each operated independent of each other, which derive their steam from a boiler, C, also mounted
50 on the sleigh A. The frame D is provided

with one or more rows—preferably three—of cutters, E, which increase in height from the front toward the rear end of the frame D, so that the rear cutters will cut deeper into the ice than the front cutters. The said row of
55 cutters is parallel with the sides of the frame D, and all the cutters of one row are mounted and secured on a rod or bar which is adjustably fastened on the cross-bars F of the frame D, so that accordingly as the rows of cutters
60 are adjusted a greater or less distance apart blocks of ice of greater or less width can be cut.

Legs G, provided at their lower ends with half-balls H, or other rounded blocks, are pivoted to the frame D at the four corners, and
65 the front legs, as well as the rear legs, are connected with each other by cross-bars. The legs at one side of the machine are provided with handles G', by means of which the legs can be erected, so that the cutters E will be
70 above the ice. All the legs can be folded against the side bars of the frame D, so that the cutters E will rest on the ice and will cut into the same. The frame D' is similar in
75 every respect to the frame D. The front ends of the cutter-frames D D' are attached to the ends of the ropes J and J', which are attached to the drums of the windlasses B and B', upon which they are adapted to be wound.

To the rear ends of the cutter-frames D D' a
80 rope, K, is attached, to pass over horizontal pulleys L L on an anchor-sleigh M, which is provided with two side wheels, N, having a series of groups of studs, a, on its periphery,
85 which studs serve to hold the sleigh in the desired position, and which project slightly from the lower edges of the runners of the sleigh, as shown in Fig. 4. The groups of studs a are
90 so arranged that the distance from one group to another is about the width or length of a block of ice, so that whenever the anchor-sleigh M is moved the distance of the length or width of three blocks of ice the circumference of the wheels N will have traveled such
95 a distance that a group of studs a enter the ice, and thus prevent the slipping of the said sleigh. The wheels N are rigidly mounted on the axle O, on which are also mounted wheels P, which are provided with a series of notches,
100 b, into which the teeth on catches or locking-

levers Q are adapted to pass for the purpose of locking the wheels N in the desired position. As the blocks are to be made longer than wide, the rope K is passed over a roller, L, at the end of the anchor-sleigh, and an additional roller, L', near the other end of the anchor-sleigh, for the cutter-frames D, must be a greater distance apart when the ends of the blocks are cut than when the sides of the same are cut. On one of the cutter-frames, D, a guide-frame, R, of the well-known usual construction, is pivoted, which has prongs or studs which pass into a previously-cut groove for the purpose of guiding the said cutter-frame, so that all the grooves cut in the ice will be parallel. The ropes J and J' pass over guide-rollers S and S' on shafts in front of the drums of the windlasses, so that the cutter-frames D will always be drawn straight, said guide-rollers to be suitably arranged for this purpose.

It is evident that the distance between the pulleys L L and the pulleys L L' on the anchor-sleigh M can be adjusted according to the desired size of the blocks of ice.

As the cutter-frames D are preferably provided with three rows of cutters, each frame D cuts three blocks in either direction at the same time. If desired, the frames D may be provided with only one or two cutters; but as that would neutralize all the advantages gained by cutting by steam I prefer to use three rows of cutters, as such a cutter-frame can easily be drawn by a steam-engine which is not too heavy for the ice to carry, and the ice can be cut quite rapidly.

The operation is as follows: The sleigh A and the anchor-sleigh M are placed a proper distance apart on the ice that is to be cut. The cutter-frame D being at the anchor-sleigh M, by winding the rope J on the drum of the windlass B the cutter-frame D will be moved toward the sleigh A and the cutters E will cut three grooves corresponding to three blocks of ice into the surface of the field of ice, the legs G of the cutter-frame having been previously turned up against the side bars of the frame D whereby the cutters are lowered upon the ice. During the time that the cutter-frame D moves from the anchor-sleigh M toward the sleigh A the rope K pulls the cutter-frame D' from the sleigh A toward the anchor-sleigh M; but the cutters of the cutter-frame D' do not cut into the ice, as the legs G of the said frame D' are turned down to be in a vertical position, so that the cutters E will be raised above the surface of the ice, the rounded blocks H at the lower ends of the legs G permitting the cutter-frame D' to move over the ice very easily and rapidly. When the cutter-frame D' has arrived at the anchor-sleigh M the cutters of the frame D are raised from the ice, and the cutters of the frame are lowered upon the ice, the rope J' is wound on the drum of the windlass B', and the cutter-frame D' is moved toward the sleigh A and cuts three grooves in the ice. The studs on the guide-frame R

enter into one of the grooves previously cut by the frame D, and thus cause the grooves cut by the cutters E on the frame D' to be exactly parallel with the grooves cut by the cutters on the frame D. Then the sleighs A and M are moved forward such a distance that when the cutter-frame D, which is now again at the sleigh M, moves toward the anchor-sleigh A the outermost groove made by the cutters of the said frame D will be the regular width of a block of ice from the outermost groove previously cut by the cutters of the frame D' when the same moved from the anchor-sleigh M to the sleigh A. In this manner all the transverse cuts can be made in the ice, and then the sleighs A and M are so placed that the frames move at right angles to the grooves or cuts previously made, and the rope K is passed over the pulleys L and L', as one dimension of the blocks is to be greater than the other. If the block is to be cut square, the rope K can always pass over the same pulleys, L L. Before the anchor-sleigh M can be moved the latches Q must be disengaged from the wheels P, and after the anchor-sleigh has been adjusted the wheels are locked in position by means of the levers or latches Q.

The rounded blocks H at the lower ends of the legs of the cutter-frames permit of moving them longitudinally or laterally very easily on the ice.

In place of the steam-windlasses shown, any other suitable device for moving the cutter-frames may be provided on the sleigh A, the steam-motor being preferred.

The above-described machine will be found to be of special advantage if a field of ice is of great length, and the sleighs A and M may be placed a suitable distance apart.

The sleighs are to be provided with calked sides and bottoms, so that they will float, and can be used as boats in case the ice breaks.

Planers and cleaners for removing snow, &c., from the surface of the ice and making the surface smooth can be operated in the same manner as the cutters.

The lower edges of the runners are sheathed, and are inclined downward in the direction of the draft, as shown, to form inclines for preventing the sleighs from being drawn toward each other by the cables.

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

1. An ice-cutting machine made substantially as herein shown and described, and consisting of a pair of cutting-frames which are moved between two sleighs located on the ice to be cut, as set forth.

2. In ice-cutting machines, the combination, with two sleighs fixed on the ice to be cut, of two cutter-frames, and of ropes for moving the two cutter-frames parallel with each other forward and backward from one sleigh to the other, substantially as herein shown and described, and for the purpose set forth.

3. In an ice-cutting machine, the combina-

tion, with a sleigh carrying devices for winding ropes on drums, and an anchor-sleigh with pulleys, of two cutter-frames, of ropes connecting the rear ends of the cutter-frames and passing over pulleys on the anchor-sleigh, and of ropes extending from the front ends of the cutter-frames to the drums of the windlasses, substantially as herein shown and described, and for the purpose set forth.

4. In ice-cutting machines, the combination, with the sleigh A and the anchor-sleigh M, provided with horizontal pulleys L L, of the cutter-frames D and D', the ropes J and J', the windlasses B and B', and the rope K, attached to the rear ends of the cutter-frames D and D', and passing over the pulleys L L on the sleigh M, substantially as herein shown and described, and for the purpose set forth.

5. In ice-cutting machines, the anchor-sleigh M, provided with the wheels N, having regularly-spaced studs *a*, substantially as herein shown and described, and for the purpose set forth.

6. In ice-cutting machines, the combination, with the anchor-sleigh M, of the wheels N, provided with studs *a*, the wheels P, provided with notches *b*, and the locking latches or levers Q, substantially as herein shown and described, and for the purpose set forth.

7. In ice-cutting machines, the combination, with the anchor-sleigh M, of the three horizontal pulleys L, L, and L', which adapt the anchor-sleigh for various widths of blocks of ice, substantially as herein shown and described, and for the purpose set forth.

8. In ice-cutting machines, the combination,

with the frame D, of three rows of ice-cutters, E, each row being attached to a bar which is adjustable on the end rods, F, of the frame D, substantially as herein shown and described, and for the purpose of permitting the adjustment of the cutters according to the desired width of the block, as set forth.

9. In ice-cutting machines, the combination, with a cutter-frame provided with cutters, of pivoted legs, substantially as herein shown and described, and for the purpose of raising the cutters from the ice when the same are not to be used.

10. In ice-cutting machines, the combination, with a cutter-frame provided with cutters, of pivoted legs having half-balls or rounded blocks at their lower ends, substantially as herein shown and described, and for the purpose set forth.

11. An anchor for ice-cutting machines, having the lower edges of the runners sheathed and inclined downward and in the direction of the draft, substantially as herein shown and described and for the purpose set forth.

12. In ice-cutting machines, the combination, with the cutter-frame D, having ice-cutters E, of the pivoted legs G, provided at their lower ends with half-balls or rounded blocks, and of the handles G' for swinging the legs G into place, substantially as herein shown and described, and for the purpose set forth.

JOHN JAMIESON.

Witnesses:

OSCAR F. GUNZ,
C. SEDGWICK.