(No Model.)

J. N. BRIGGS.

APPARATUS FOR PLANING CAKES OF ICE FOR STORING.

No. 346,576. Patented Aug. 3, 1886.

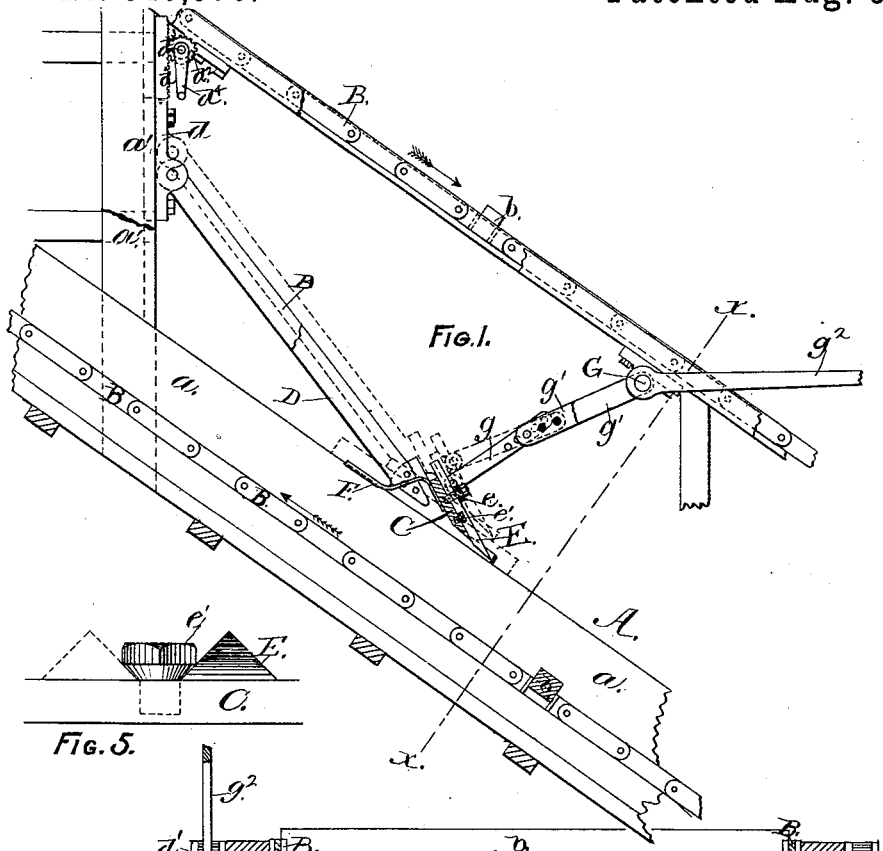

Fig. 1.

Fig. 5.

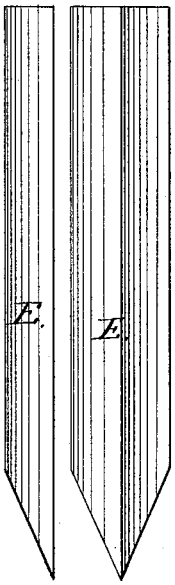

Fig. 3. Fig. 4.

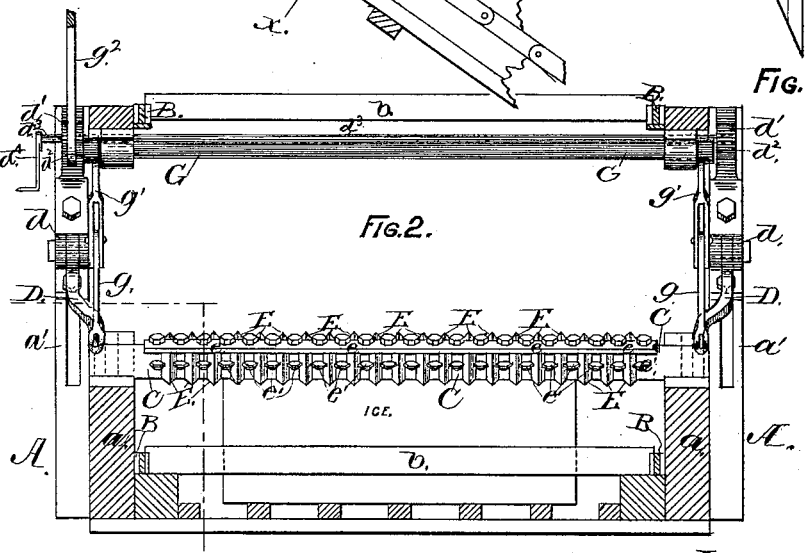

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN N. BRIGGS, OF COEYMANS, NEW YORK.

APPARATUS FOR PLANING CAKES OF ICE FOR STORING.

SPECIFICATION forming part of Letters Patent No. 346,576, dated August 3, 1886.

Application filed April 7, 1886. Serial No. 198,114. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. BRIGGS, of Coeymans, in the county of Albany and State of New York, have invented new and useful Improvements in the Apparatus for Planing Cakes of Ice for Storing, of which the following is a specification.

Much difficulty has heretofore been experienced in properly storing ice for use in warm weather by reason of the unequal thicknesses of the different cakes of ice, whereby an uneven and broken surface of the upper layer of the mass was produced, which greatly interfered with the sliding of the cakes over the surface, and involved excessive labor and expense in the proper storage of the ice. To remedy this difficulty recourse has commonly been had to chipping off the upper surface of the ice after each layer has been placed in the house. This, while it partially remedied one trouble at a great cost, produced another as great by reason of the chips of ice falling into and filling up the vertical spaces formed around adjoining cakes for the purpose of drainage and to facilitate the removal of the cakes from the mass.

The object of my invention is to remedy this difficulty, to provide facilities for the more effectual drainage of the water produced by the melting away of the ice, to afford a more certain foothold for the workman employed in storing the ice, and to facilitate the separation of the cakes in summer.

To this end my invention consists in reducing or planing the cakes of ice for each layer to a uniform thickness, and at the same time grooving or corrugating the upper surface of each cake, so as to form ridges for affording a suitable foothold, and furrows or channel-ways for the passage of the drainage-water, and also presenting less contact surface between the cakes to freeze together.

In the accompanying drawings, which are herein referred to, and form part of this specification, Figure 1 is a side elevation of my reducing apparatus applied to an ice-house elevator; Fig. 2, a transverse section of the same at the line *x x;* and Figs. 3, 4, and 5 are respectively a detached and enlarged side elevation, front elevation, and end elevation of a preferred form of chisel for the cutter-head of my reducing apparatus.

As illustrated in the drawings, A represents an inclined elevator or railway commonly used for raising the ice into the ice-houses, a small portion of the same only being shown; B, the endless chain, provided with cross-bars *b* for moving the cakes of ice up the inclined railway. The said chain may be operated by steam or any suitable motive power.

The said parts, being common and well known, do not constitute any part of my invention, which consists of the following parts: C is the cutter-head, secured to the free ends of the side links, D, and bearing on each of the lower string-pieces, *a*, of the inclined railway, so as to extend entirely across the latter. The upper face of said cutter-head, which is a straight bar or plate, is fixed at an acute angle to the inclination of the string-pieces *a*, and upon it are secured a series of chisels or cutter-teeth, E. The latter are preferably made in the triangular prismatic form shown in Figs. 3, 4, and 5, with the lower end formed in a sharp point. These are arranged with their cutting-points ranged on a straight line, or nearly so, that will be parallel with the forward edge of the cutter-head, and so as to leave a clear space between the several cutters, as shown in Fig. 2, and by this means grooves are formed in the ice with a slightly greater depth at the center line of each, said grooves being separated by a ridge equal to the width of the space between the teeth. These cutter-teeth are held in place at their upper ends by a cross-bar, *e*, which passes over all the teeth and at their lower ends by conical-headed tap-bolts *e'*, which are inserted in the spaces between the teeth. Springs F are secured to the under side of the cutter-head C, to prevent the cake of ice which is being planed from being thrown up by the action of the cutter-teeth.

The links D are pivoted to the boxes *d*, which are placed at a sufficient height from the string-pieces *a* to bring the links D at an acute angle to the inclination of said string-pieces, and by this arrangement the force applied to the ice to effect the planing will tend to press the cutter-head down firmly upon the top of the string-pieces *a*. The boxes *d* are adjustably fixed to the studs *a'*, and are provided with racks *d'*, which engage with pinions d^2, secured to a cross-shaft, d^3, that is operated by a crank,

d^4, so that by turning the shaft d^3 the pivotal points of the links D can be readily raised or lowered, as occasion may require. For the purpose of raising and lowering the cutter-head C, the latter is connected by adjustable rods g to arms g', fixed to the crossed shaft G, which is operated by the hand-lever g^2. The arms g' and rods g form toggle-joints to hold the cutter-head C down to its work, and the normal position of said cutter-head is usually where it will bear upon the upper side of the string-pieces a; but in dressing ice to a greater thickness than that produced by the cutter-head bearing on the string-pieces a the boxes d can be raised up and the cutter-head C correspondingly blocked up, as indicated by the dotted lines in Fig. 1, the adjustability of the rods g permitting such changes to be made.

The operation of my apparatus is as follows: The cakes of ice are placed on the elevator A, so that a cross-bar, b, of the constantly-moving endless chain B will engage against the rearmost edge of the cake, and so that the latter will be in condition to slide upon the ribbons a^2 of the elevator. As the cake of ice is brought in contact with the cutter-head, the sharp points of the cutter-teeth E will penetrate the ice at the required height from the bottom of the cake and remove any excess of the thickness, the line of fracture following the line formed by the wide base of the cutter-teeth, while the pointed ends of the cutter-teeth penetrate deeper into the cake and form the grooves in the upper surface of the cake, as hereinbefore described. This action is continued until the cake of ice has been subjected to the action of the cutter-teeth over its entire length, and the finished cakes are then carried by the motion of the endless chain to the point of delivery, from whence they are removed and stored in the ice-house. The cakes of ice are stored in the ice-house in layers, with the grooved surface uppermost, so that the bottom surface of the successive layers will rest on the ridges of the grooved surface of the cakes in the next layer below, and it will readily be seen that the grooves in the upper surface of the cakes will form perfect channel-ways to carry off the drainage-water from each layer into the vertical spaces which are always left between the blocks of ice.

The corrugated upper surface of each layer, while it does not interfere with the easy sliding of the cakes upon the surface of each layer, will afford a stable footing for the workman, so that he can perform his work to better advantage.

When preferred, the cutter-head C may be provided with cutter-teeth of a different form from those shown in the drawings—as, for instance, a series of flat chisel-pointed cutters, or of any other preferred form, may be substituted, and such cutters may be spaced apart or fixed close together side by side; and, when preferred, the cutter-head C, provided with cutter-teeth E, may be rigidly bolted in position on the string-pieces a, and in such cases the means herein described for adjusting said cutter-head may be dispensed with.

By providing the cutter-head with narrow cutter-teeth I facilitate the repairing of the cutting mechanism, for the reason that only the space injured needs to be repaired, whereas by use of the wide cutter commonly used, when an injury is done at one part of the cutter the entire cutting-edge must be ground to remedy the injury.

I claim as my invention—

1. The cutter-head C, provided with a series of narrow cutter-teeth or chisels, E, which are separately removable from said cutter-head, as and for the purpose specified.

2. The combination, with a cutter-head that is pivoted at its rearmost edge to the frame-work of the elevator by means of links, which are rigidly attached to said cutter-head, and which are arranged at an acute angle to the inclination of said elevator, of the cross-shaft G, provided with arms g, and the rods g' for connecting said arms with the cutter-head, the said arms and rods forming toggle-joints, as and for the purpose specified.

3. The inclined railway A and endless chain B of an ice-elevator, in combination with a cutter-head, C, which is connected to said elevator by means of links D, that are pivoted to boxes d, provided with racks d', the said racks being adapted to engage with pinions d^2 on the shaft d^3, as and for the purpose herein specified.

4. The combination, with a cutter-head, C, held in a fixed unyielding position during the operation of planing cakes of ice, of the springs F, fixed to the rearmost side of said cutter-head, and adapted to bear upon said cakes of ice and prevent them from being displaced during the said operation of planing, as herein specified.

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