To all whom it may concern:

Be it known that I, Robert H. Roark, a citizen of the United States, residing at Waco, in the county of McLennan and State of Texas, have invented a new and useful Improvement in Methods of and Means for Scoring Ice, of which the following is a specification.

This invention relates to ice scoring machines, and has for its object the provision of a novel mechanism for scoring a block of ice longitudinally and transversely to define a plurality of units, any desired number of which may be easily broken off by the retailer. The scoring not only facilitating the division of the block into smaller pieces which will be uniform and marketable, but also insuring the delivery of an accurate amount without requiring weighing.

A further object is the provision of a machine of this character which will be comparatively simple and inexpensive to manufacture and assemble, easy to control and operate, not likely to get out of order, and a general improvement in the art.

The invention embodies novel means for turning or tilting the block of ice after it has been scored in one direction, so that it may pass between saws for scoring in another direction, the entire machine being power driven and consequently positive in operation, and the tilting mechanism for turning the block being automatically operated and thus requiring no direct attention.

To the attainment of the foregoing the invention consists in the construction, combination, and arrangement of parts to be hereinafter more fully described and claimed, it being understood, however, that the specific mechanism is merely an exemplification of a preferred structure, and the right is reserved to make such changes as will increase the utility or adaptability of the device, and to make all variations or modifications which will not depart from the salient features of the invention, or the scope of the appended claims.

In the drawings:

Figure 1 is a side elevation of the machine;
Figure 2 is a plan view;
Figure 3 is a horizontal section on the line 3—3 of Figure 1;
Figure 4 is a vertical cross section on the line 4—4 of Figure 1;
Figure 5 is a vertical cross section on the line 5—5 of Figure 1, distant parts being omitted.

Referring more particularly to the drawings, I have shown my device as comprising an elongated rectangular frame 10, which consists of any desired arrangement of longitudinal and transverse main bars, and any desired number of upright or other auxiliary bars which may be found necessary to support the bearings and other elements of the mechanism. At the bottom of the frame are provided longitudinal skids or tracks 11 which form a guide for the blocks of ice A to be scored. These skids extend from the entrance end 12 of the machine to a point at approximately the center thereof, and the block of ice is conducted onto these skids in upright position from any suitable conveyer or other means not shown.

Journalized in suitable bearings at one side of the entrance end are vertical shafts 13 and 14 which carry sprockets 15, about which are trained feed chains 16 provided with prongs or teeth 17 which are adapted to engage against one rear edge of the successive blocks of ice for conducting them through the machine. The upper end of the shaft 13 carries a bevel gear 18, meshing with a bevel gear 19 on a counter shaft 20, journalized at the top of the entrance end and carrying a pulley 21. Journaled upon the top of the frame nearer the intermediate portion thereof is a shaft 22 carrying a pulley 23, about which is trained a belt 24 which drives the pulley 21. Also secured on the shaft 22 is a pulley 25, about which is passed a belt 26, which extends rearwardly and which is engaged about a pulley 27 on a horizontal shaft 28, journalized at the top of the outlet end of the machine. Any suitable power device may be provided for rotating the shaft 28 to drive the above mechanism and the other mechanism to be hereinafter described, though a convenient arrangement is to employ an electric motor 29 mounted on the frame, and having its shaft carrying a pulley 30 about which is trained a belt 31 engaged about a pulley 32 on the shaft 28.

The means for scoring the blocks of ice
transversely consists of a pair of saws 33 carried by vertical shafts 34 journalized in suitable bearings on the frame, and driven from the shaft 32 by means of intermeshing bevel gears 35 and 36, carried respectively by the shafts 22 and 34.

Located at the intermediate portion of the machine is a tilting cage 37, carrying trunnions 38 rotatable through the sides of the frame, and this cage has one edge and one end open. One trunnion has rigidly secured thereto a normally upstanding lever 39, for a purpose to be described. A feature to be observed is that the pivotal mounting of this cage is such that its normal tendency is to remain in upright position. This cage is, however, to be tilted by mechanism to be described, and when in the tilted position, shown by the dotted lines in Figure 1, it will lead to inclined tracks or skids 40 which are located at the outlet end of the machine.

To effect movement of the cage to its discharging position, I provide a shaft 41 journalized across the top of the frame rearwardly of the shaft 22, and carrying a bevel gear 42 which meshes with a bevel gear 43 on the upper end of the shaft 14. Carried by the shaft 41 is a sprocket 44, about which is passed a chain 45 which is, in turn, passed about an idler sprocket 46, suitably journalized at one side of the frame. The chain 45 travels between the lever 39 and the adjacent side of the frame, and carries a lug 47 designed to engage the lever 39 at a certain time, whereby to tilt the cage upon its trunnions. The ratio of the different pulleys which form part of the transmission mechanism is important, as the movement of the feed chains 16 and chain 45 must have such a relation that the successive blocks of ice will be conducted properly through the machine, the blocks being passed or forced by the chains 16 into the cage 37 when the latter returns to upright position after being tilted.

The means for effecting longitudinal scoring of the blocks consists of a pair of saws 47 secured upon slightly inclined shafts 48, journalized in suitable bearings at the outlet end of the machine. The shafts 48 carry bevel gears 49 meshing with bevel gears 50 on the shaft 28.

Assuming that the device has been constructed and assembled as above described, and assuming that the motor is in operation to drive the various shafts, the blocks of ice to be scored are fed into the inlet end of the machine in upright position and resting upon the tracks or skids 11. The successive blocks are engaged by the successive lugs 17 on the feed chains 16, and are moved along the tracks and between the rotating saws 33, which will naturally operate to cut a groove or score the blocks transversely, as indicated by the dot-and-dash lines 51 in Figure 1. After passing between these saws, each block is forced by the chains 16 into the cage 37. The mechanism is so timed that when a block enters the cage, the lug 47 on the chain 45 will engage against the forward edge of the lever 39, and swing it and consequently tilt the cage, into the position shown by dotted lines in Figure 1. As the top end of the cage is open, the blocks of ice will slide out and pass along the skids 40. As the block passes between the rotating saws 47 it will be scored longitudinally in an obvious manner. The skids 40 may lead simply to a platform or to any suitable conveyor mechanism, not shown. Immediately upon discharging a block of ice and upon the lever 39 being disengaged by the lug 47, the cage will return gravitationally to normal or upright position ready to receive the next block.

From the foregoing description and a study of the drawings, it will be apparent that I have thus provided a simply constructed and rapidly operating machine, which will accurately score or groove blocks of ice longitudinally and also transversely, the entire mechanism being power driven and being consequently positive in operation. Attention is called to the fact that ample means is provided for shifting the block automatically from one position to another while it progresses through the machine. Owing to the simplicity of the construction, and the comparative fewness of parts, it is apparent that there is little to get out of order so that the device should have a long life.

It is obvious that the machine could be arranged to enter the block in a horizontal position, score it lengthwise, then reverse and score crosswise, which is just the reverse of what is shown hereinbefore described. A distinctive feature of this invention lies in the fact that the general course of direction of the block of ice is not changed, though its position is altered, in carrying out the method constituting my invention.

What is claimed is:
1. The herein described method which consists in moving a block of ice in one direction and simultaneously scoring the sides thereof, tilting the block to an inclined position through an arc of substantially 90°, and while in the inclined position causing the block to move by gravity in the same direction and simultaneously causing the scoring of the block in a direction transverse to the first scoring.
2. The herein described method, which consists in moving a block of ice along a track in one direction and simultaneously scoring the sides thereof, automatically tilting the block at the completion of the first scoring through an arc greater than 90°, and without changing the general direction of movement depositing the block upon an inclined track, and causing the block to move by
gravity along the track and simultaneously scoring the block in a direction transverse to the first scoring.

3. In an ice-scoring machine, guide means at the entrance end, horizontal rotary saws thereabove, means for conducting a block of ice along said guide means between the saws, means for subsequently tilting the block through an arc of substantially 90°, an inclined guide track at the outlet end onto which the block passes from the tilting means without changing the general direction of movement, and a set of inclined saws above said inclined track between which the block passes.

4. In an ice-scoring machine, guide means at the entrance end, scoring saws above said guide means, means for feeding blocks of ice along the guides between the saws, a tilting cage receiving the successive blocks subsequent to their passage between said saws, means for tilting said cage at intervals for turning the blocks through an arc of substantially 90°, scoring saws at the outlet end between which the blocks pass subsequent to being tilted, and gravity means for feeding the blocks between the second named saws.

5. In an ice-scoring machine, guide means at the entrance end, scoring saws above said guide means, a tilting cage receiving the block subsequent to its passage between said saws, means for tilting said cage at intervals for turning the block through an arc of substantially 90°, scoring saws at the outlet end between which the block passes subsequent to being tilted, power operated means for feeding the block between the first named saws and into the cage, and inclined guides at the outlet end whereby the block will pass gravitationally between the second set of saws.

6. In an ice-scoring machine, guide means at the entrance end, horizontal rotary saws thereabove, a tilting cage, means for passing a block of ice between said saws and into said cage, inclined guide means at the outlet end, rotary saws above said outlet guide means, means for tilting the cage to discharge the block in an inclined position onto said outlet guide means, and gravity means for feeding the block between the second named saws.

7. In an ice-scoring machine, guide means at the entrance end, rotary upright shafts carrying saws above said guide means, a tilting cage at the intermediate portion of the machine, feed chains for passing a block of ice between said saws into the cage, inclined guide means at the outlet end of the machine, shafts arranged at right angles to said outlet guide means and extending upwardly, scoring saws on said last named shafts, means for driving all of said shafts and said feed chains simultaneously, a sprocket driven from one of said shafts, a chain driven from said sprocket carrying a lug, and a lever on the cage in the path of movement of said lug, whereby the cage is tilted.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

ROBERT H. ROARK.