May 18, 1926. 1,584,921

H. L. GEE ET AL

ICE SCORING MACHINE

Filed June 4, 1924 2 Sheets-Sheet 1

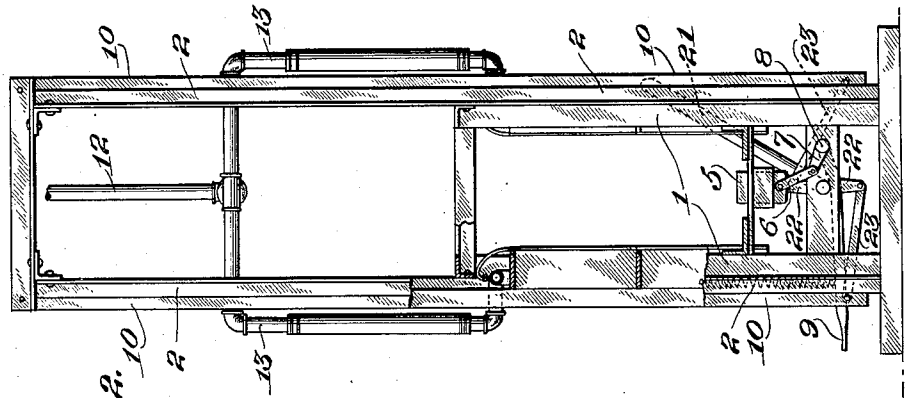


Fig. 2.

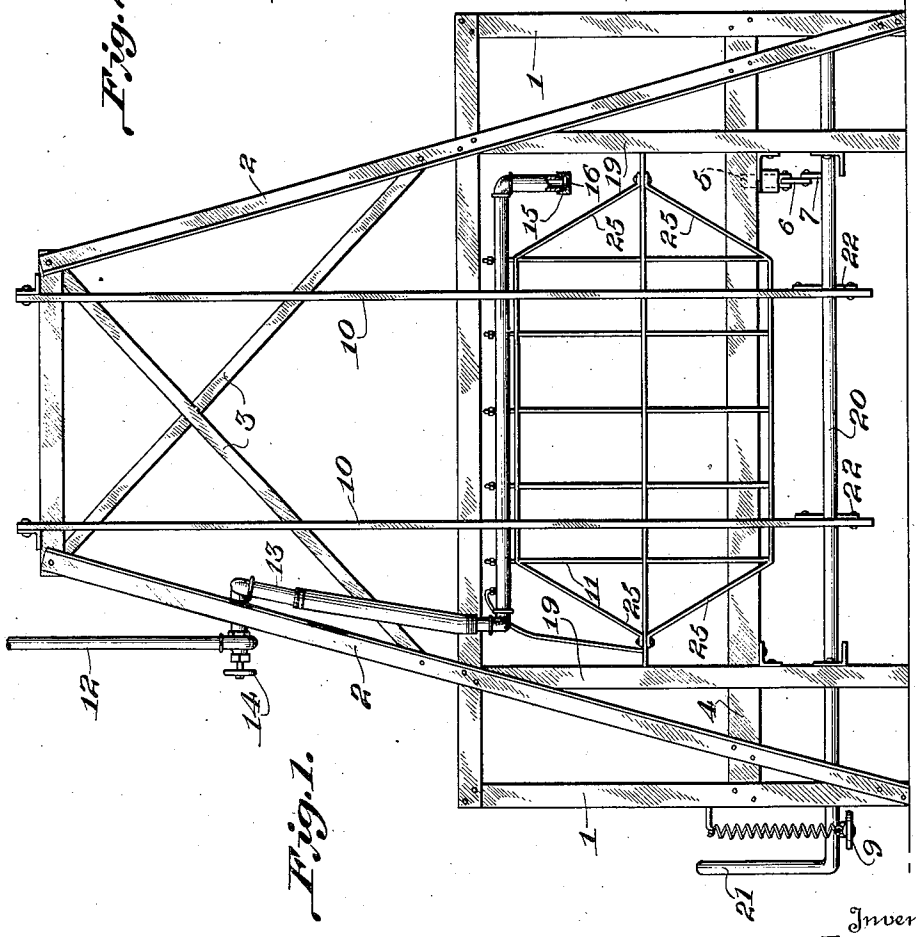


Fig. 1.

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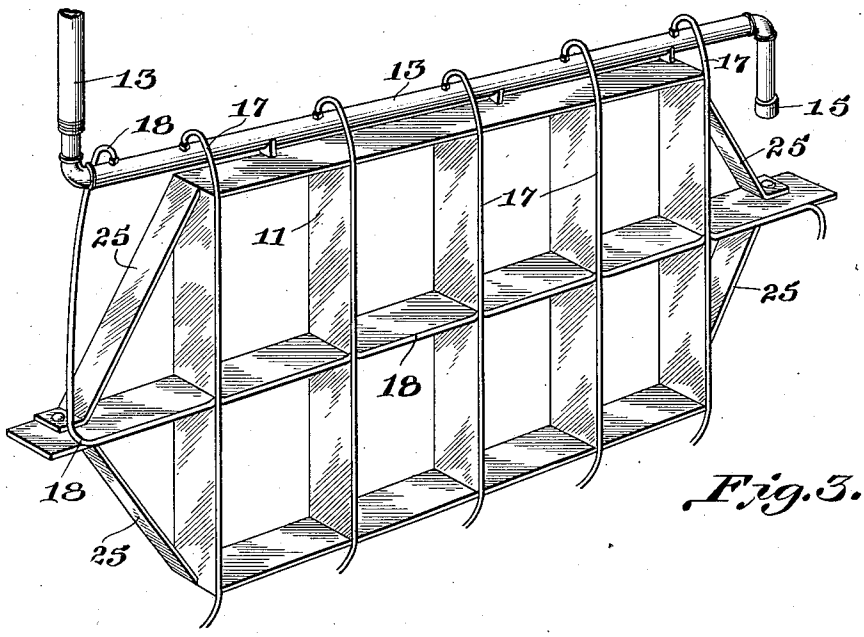
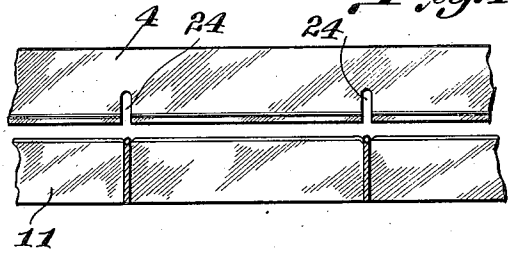


Fig. 3.

Fig. 4.



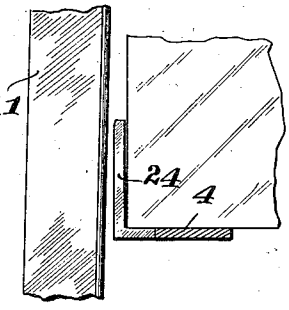
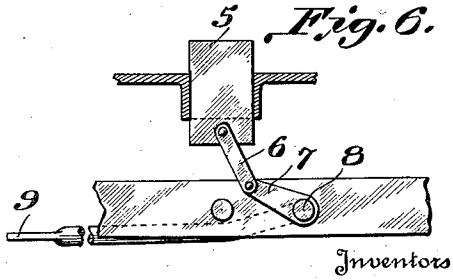


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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ICE-SCORING MACHINE.

Application filed June 4, 1924. Serial No. 717,697.

The invention relates generally to a machine for scoring blocks of ice, so that the scored blocks may be quickly and easily broken into smaller blocks of uniform size; and more particularly the invention relates to a simple machine by which the blocks may be scored by heat instead of by cutting or sawing.

A further object of the invention is to provide a machine of this character which will simultaneously score both sides of the block.

Another object of the invention is to provide a machine of this character by the use of which the scoring lines, both vertical and horizontal, will always be accurately positioned.

Still a further object of the invention resides in the provision of means whereby the heated members are forced to rapidly enter the ice, thereby making a sharp score in contrast to the wide V-shaped score which results from scoring by heat when the heated element is not forced to rapidly enter the ice.

Another object of the invention is to provide means whereby there is a fixed limit to the extent to which the scoring means may enter the block; and also means by which the depth of scoring may be varied as desired.

Other objects and advantages of the invention will be apparent to those skilled in the art, from the following detailed description, when taken in connection with the accompanying drawings; in which—

Figure 1 is a side elevation of the complete apparatus.

Figure 2 is an end of the apparatus, taken from the right of Figure 1, and parts being broken away to more clearly show the construction.

Figure 3 is a detail perspective view of one of the scoring members with the heating means mounted thereon.

Figure 4 is a detail plan view showing the construction by which the extent of inward movement of the scoring members is limited.

Figure 5 is a detail elevational view showing the construction by which the extent of inward movement of the scoring members is limited; and,

Figure 6 is a detail view illustrating any conventional form of stop mechanism.

Referring to the drawings more in detail, numerals 1, 1, indicate vertical spaced side frames of any desired construction; and extending up from these side frame members are other frame members 2, 2, which are connected at the top by cross frames; and the entire structure being reinforced by cross arms 3 wherever necessary to give sufficient strength. The whole structure is preferably made of steel angles.

Attached to the lower portion of the side frame members are two angles 4, 4, extending the entire length of the apparatus from the front to rear thereof. These angles are sufficiently spaced and are of sufficient width to support the large blocks of ice that are to be scored.

The blocks of ice will be pushed onto the angle members one at a time, and in order that each block may be properly positioned for scoring there is provided any conventional stop mechanism. Merely for purposes of illustration we have shown a vertically movable block 5 connected by a link 6 with a lever 7 carried by a shaft 8 having a foot treadle 9 at the front end thereof. Obviously by depressing the treadle 9 the stop block 5 will be lowered, thereby permitting the scored block to be pushed out of the apparatus through the rear end thereof.

Two arms 10, 10, are mounted on each side of the apparatus, and are pivotally attached to the top of the frame and extend downwardly to a point near the base of the apparatus. Attached to each pair of these pivotally mounted arms is a scoring member, indicated generally by the numeral 11. Each of these scoring members consists of horizontally and vertically arranged plates several inches in width. These plates are arranged in the manner clearly illustrated in Figures 1 and 3. Of course these plates may be spaced as desired to score blocks of the required size.

Referring particularly to Figures 1 and 3, numeral 12 indicates a main steam line which is divided into two branches 13, 13, controlled by a valve 14. Each of these branches leads down to the top of one of the scoring members at the front thereof, and then leads back to the rear of said member and is turned downwardly. The turned down end of each of pipes 13 is closed by a cap 15 having a small aperture 16, for a purpose to be described hereinafter. Leading off from the top of each pipe 13 is a series of small scoring pipes 17; one of said scoring pipes running down the inner edge of each

of the vertical plates of the scoring frames. And a similar scoring pipe 18 leads downward from the top of pipe 13 and runs from the front to the rear of the inner edge of the central horizontal plate of the scoring frame. All of these scoring pipes preferably lead into some common exhaust pipe (not shown).

By taking the scoring pipes 17 and 18 from the top of pipe 13 only dry steam will be admitted to the scoring pipes, and any water of condensation in the pipe 13 will be carried to the trap at the rear end thereof and will be gradually discharged through the small aperture 16.

It is to be noted that the central horizontal plate of the scoring frame is of greater length than the frame itself, and the ends of this plate are adapted to abut against frame members 19, as clearly illustrated in Figure 1. By this construction all longitudinal movement of the scoring frames is prevented and hence the frame will always be accurately positioned.

The scoring frames together with the scoring pipes carried thereby may be simultaneously moved toward and from each other in any desired manner, and the invention is not, of course, limited to the particular mechanism illustrated herein. The simple mechanism herein illustrated consists merely of a longitudinal shaft 20 having an operating lever 21, and having fixed thereto two upwardly and downwardly extending cranks 22; one of said cranks being provided for each pair of oppositely disposed swinging arms 10. Leading from the top and bottom of each of said cranks is a link 23, which is attached at its opposite end to one of the swinging arms 10. Obviously by moving the operating lever 21 the arms 10 and the scoring frames and scoring pipes carried thereby, will be caused to simultaneously move toward or from each other, as may be desired. Any means (not shown) may be provided for holding the frames in their outward or inoperative position. It may be noted here that the invention is by no means limited to swinging scoring frames, for obviously the frames could just as well be mounted for reciprocating movement toward and from each other; and obviously also, it is not essential that both scoring frames be movable, for one of the frames could be fixed and the other frame could be moved toward and from it by either a swinging or a reciprocating movement.

The depth of scoring may, of course, be regulated by the extent to which the lever 21 is moved, but the usual practice will be to score all blocks to the same depth, and it is therefore highly desirable to provide some means by which the extent of the depth of scoring is limited or fixed. Referring now particularly to Figures 4 and 5 it will be seen that the longitudinal angles 4, 4, on which the large block of ice rests, are provided with a series of vertical and horizontal slots 24, there being one of said slots for each of the vertical plates of the scoring frame 11; and the depth of the horizontal portion of each slot being equal to the depth of scoring desired. So that when the scoring frames are moved inward the pipes 17 will abut against the end walls of the slots and prevent any further inward movement of the scoring frames. It will also be noted that the inclined members 25 of the scoring frames are of less width than the horizontal and vertical plates forming the frame, as clearly illustrated in Figure 3; and this difference in width is exactly equal to the depth of scoring desired. So that when the scoring frames have been moved inwardly to their full extent, not only will the scoring pipes engage the inner end walls of the slots 24, but also the inclined frame members 25 will engage the angle member 4, as clearly illustrated in Figure 1.

The operation of the apparatus may be briefly described as follows:

A large block of ice to be scored is pushed into the front of the apparatus, resting on the angles 4, 4; and it is moved inwardly until it is properly positioned by abutting against the stop block 5. Steam has been admitted, of course, to the scoring pipes and those pipes being thoroughly heated, the lever 21 is moved to cause the scoring frames and scoring pipes to move inwardly. The heat of the pipes melts the ice, and these pipes are forced to rapidily enter the ice because of the pressure applied to the lever 21. This is important, for if the pipes rapidly enter the ice there will be a sharp score, in contrast to a V-shaped score which results when heating members enter the ice slowly because of lack of pressure.

As previously stated, the depth of scoring may be varied as desired by varying the extent of movement of the lever 21, but in ordinary practice all blocks will be scored to the same depth, and this depth of scoring is fixed in the present apparatus by the engagement of the scoring pipes with the end walls of the slots 24.

The blocks are thus scored simultaneously on both sides; and the scoring operation having been completed the treadle 9 is depressed to lower the stop block 5, thereby releasing the scored block of ice and permitting it to be discharged through the rear of the apparatus as the next block is pushed into the front thereof.

In actual practice the entire apparatus may be tilted so that it will be slightly inclined from the front to the rear. By such an arrangement the ice blocks may be fed directly from the containers to the apparatus, and as each block is scored and re-

leased it will pass on through the apparatus onto the loading platform or such other point as may be desired.

It is well known that the blocks of artificial ice have slight taper, and consequently when the blocks are scored by sawing it is impossible for all of the small blocks to have the same cubic content. In the present apparatus, however, the plates of the scoring frames will be so spaced that this taper of the large blocks will be allowed for, and consequently when a block is scored all of the smaller blocks will have exactly the same number of cubic inches.

It is believed that the construction and operation of the apparatus will be clearly understood from the foregoing description, and it will be apparent that we have devised a scoring apparatus which is not only simple in construction and inexpensive in manufacture, but also will operate in a rapid, efficient, and economical manner.

In accordance with the patent statutes we have described what we now believe to be the best embodiment of the invention, but we do not wish to be understood thereby as limiting ourselves or the scope of the invention, as many changes and modifications may be made without departing from the spirit of the invention; all such we aim to include in the scope of the appended claims.

What we claim as new and desire to secure by Letters Patent is:

1. An apparatus for scoring ice, including two oppositely movable heating members, means for causing said members to simultaneously move inwardly into engagement with the ice and for limiting the extent of inward movement.

2. An apparatus for scoring ice, including two oppositely arranged scoring frames, said frames comprising horizontally and vertically arranged plates, scoring pipes arranged along the inner edge of said plates, and means for simultaneously moving said frames toward or from each other.

3. An apparatus for scoring ice, including two oppositely arranged angles for supporting the ice to be scored, each of said angles provided with a series of slots, a pair of oppositely arranged scoring frames, scoring elements carried by the frames, means for moving said frames toward or from each other, the frames cooperating with the slots to limit the inward movement of the frames.

4. An apparatus for scoring ice, including a supporting member for the ice to be scored, a scoring frame comprising horizontally and vertically arranged plates provided with scoring elements, strengthening plates carried by the frame and of less width than the first-mentioned plates, means for moving said frame toward and from the supporting member, whereby the depth of scoring is limited in extent to the difference in width between said plates.

5. An apparatus for scoring ice, including a main frame, a scoring frame, scoring pipes carried by said scoring frame, means for moving said scoring frame back and forth, projections carried by each end of the scoring frame, said projections having abutting relation with members of the main frame to prevent longitudinal movement of the scoring frame.

6. An apparatus for scoring ice, including a supporting member for the ice to be scored, a movable stop block for properly positioning the ice, scoring frames, scoring pipes carried by said frames, a shaft associated with the apparatus, crank and link connections between said shaft and said scoring frames to move the frames toward or from each other, and a lever for operating said shaft.

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