No. 694,260. Patented Feb. 25, 1902.

J. S. DUNCAN.

MACHINE FOR SAWING ICE INTO CUBES OR BLOCKS.

(Application filed Sept. 26, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

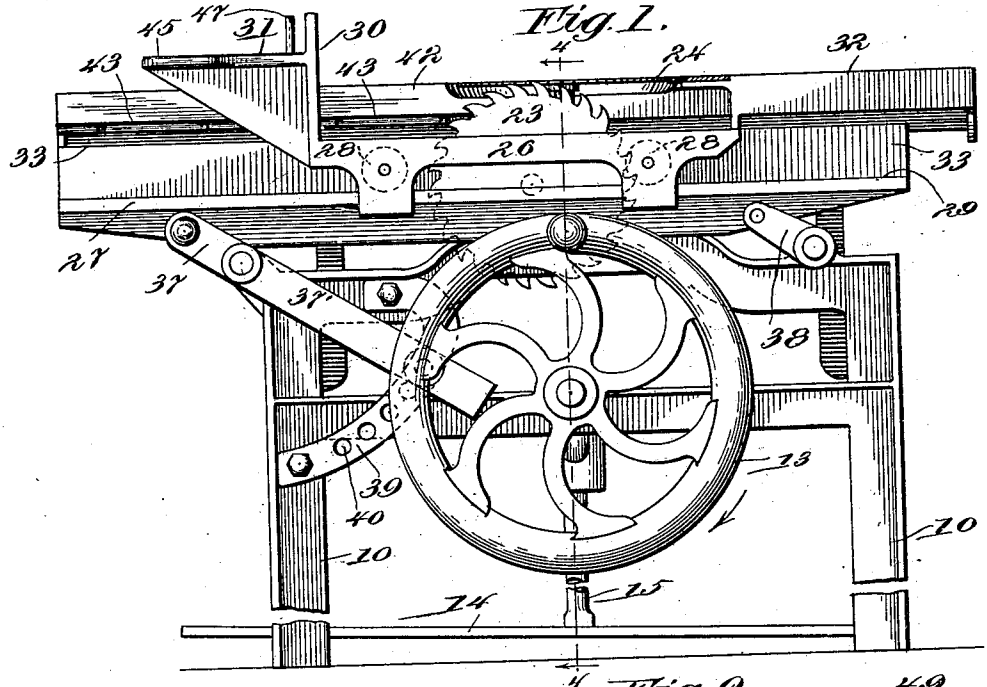
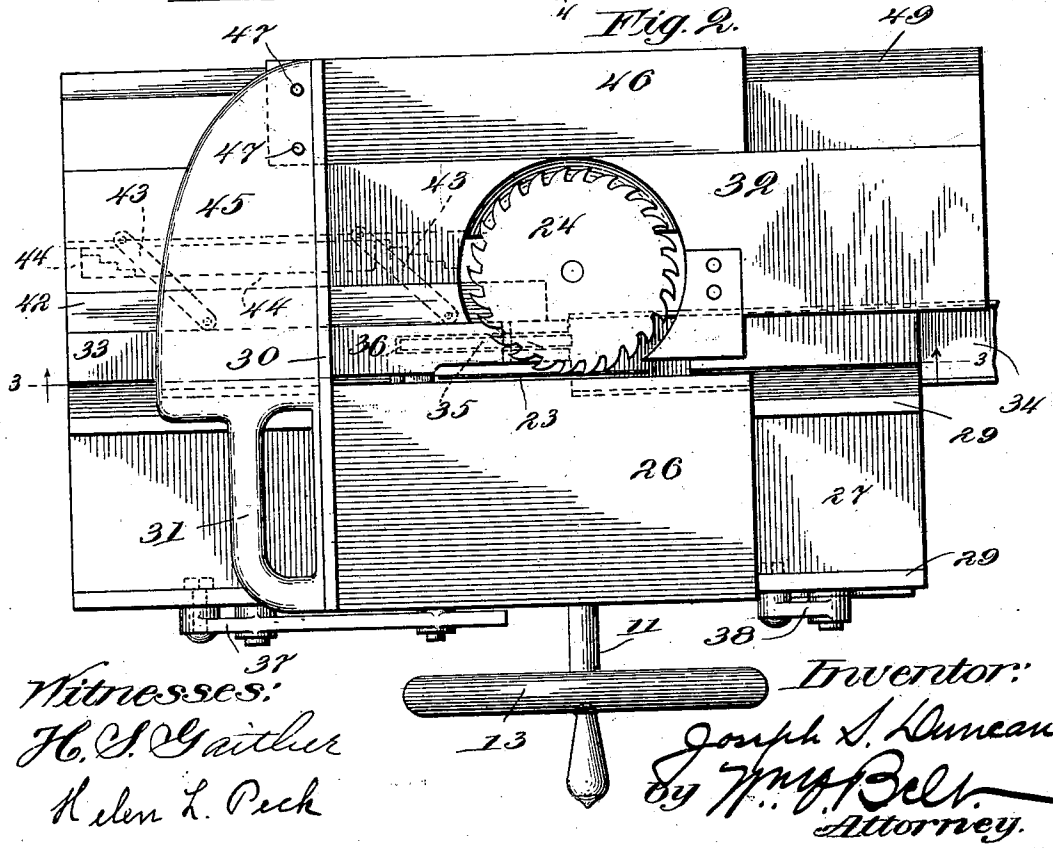


Fig. 2.



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Fig. 3.

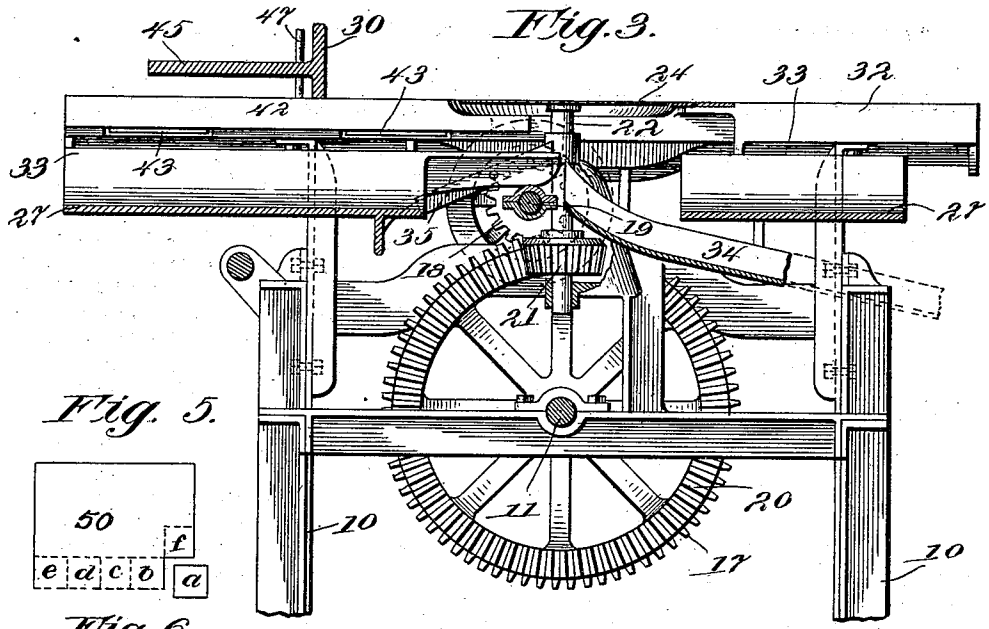


Fig. 5.

Fig. 6.

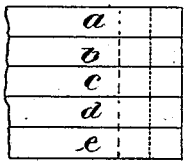
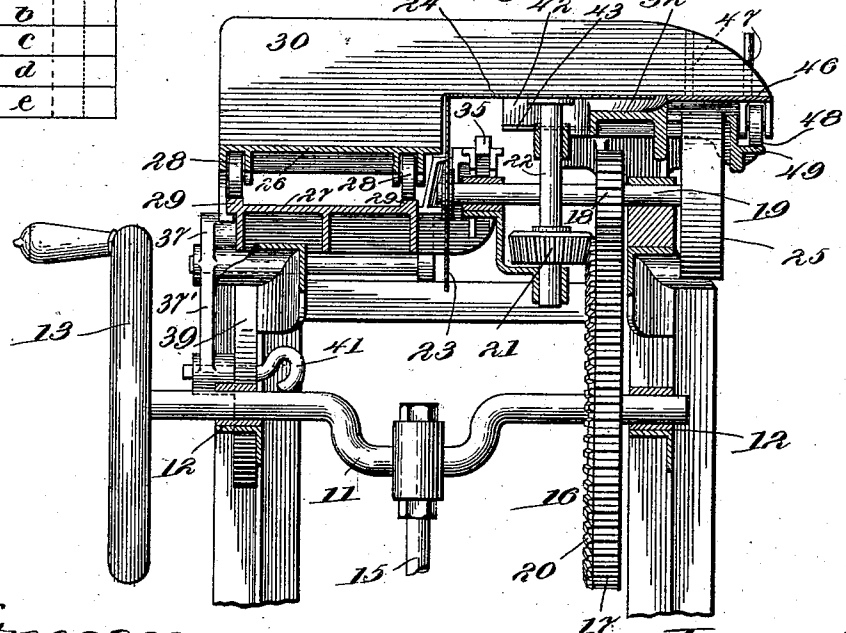


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSEPH S. DUNCAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO ICECUBATOR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR SAWING ICE INTO CUBES OR BLOCKS.

SPECIFICATION forming part of Letters Patent No. 694,260, dated February 25, 1902.

Application filed September 26, 1901. Serial No. 76,651. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Sawing Ice into Cubes or Blocks, of which the following is a specification.

The object of this invention is to provide a machine of simple construction which can be easily operated to divide large cakes of ice into cubes or blocks of suitable size for use in dispensing liquids, such cubes or blocks being attractive in appearance, easy to handle, and preventing waste, and being especially useful in hotels, clubs, saloons, and restaurants and at all refreshment places where iced liquids are dispensed.

With these and other ends in view the invention consists in the novel construction and arrangement and operation of parts of the machine hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine, showing the carriage partly advanced. Fig. 2 is a top plan view of the machine with the parts in the position appearing in Fig. 1. Fig. 3 is a longitudinal sectional view on the line 3 3 of Fig. 2. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 1. Fig. 5 is a diagrammatic view of a cake of ice, showing the manner in which it is divided into sections, the letters *a b c d e f* indicating the sections in the order in which they are cut. Fig. 6 is a diagrammatic view showing the sections in position for crosscutting.

In the drawings like numerals of reference designate corresponding parts in the several figures, and, referring thereto, 10 designates a frame of any suitable character, on which the operative parts of the machine are mounted, the construction of the frame being capable of such variations and changes as will occur to those skilled in the art for adapting it to machines of different sizes and capacities. A shaft 11 is journaled in bearings 12 in the frame and is operated by means of a hand-wheel 13 on one end or by a foot-treadle 14 connected with the shaft by a rod 15. This shaft carries a gear-wheel 16, which is provided with a double set of teeth, one set 17 on its periphery being arranged to mesh with the teeth of a pinion 18, carried by the saw-shaft 19, and the other set 20 on the side of the wheel adjacent to the periphery thereof being arranged to mesh with a bevel-pinion 21, carried by the saw-shaft 22. The gear-wheel thus combines a spur-gear and a bevel-gear, the spur-gear being arranged to impart rotary motion to the shaft 19 and the upright saw 23 carried thereby, and the bevel-gear being arranged to impart rotary motion to the shaft 22 and the horizontal saw 24 carried thereby. The saw-shafts are journaled in suitable bearings in the frame, and I prefer to provide the shaft 19 with a fly-wheel 25.

The saws are supported by their shafts so that they will lie in planes at right angles to each other, and the upright saw 23 is located slightly in advance of the horizontal saw 24, so that the cutting-lines of the saw in the ice will intersect, and thus produce a block of rectangular form with sharply-defined edges and angles.

The cake of ice to be divided is supported on a carriage 26, which is mounted and arranged to travel upon a table 27 on the frame. The carriage is provided with rollers 28 on its under side, which travel on tracks 29 on the table, and at the back of the carriage is an upright guard 30, which is provided with a handle 31, by means of which the carriage is moved back and forth over the table and adjacent to the upright saw 23.

The machine is provided with a top plate 32, which lies in substantially the same plane as the horizontal saw 24, said plate being cut out to accommodate this saw, so that the ice may pass readily thereover as sections are cut from the lower side of the cake. This top plate is stationary and is located above the carriage, so that the cake of ice resting upon the carriage can be pushed up against the side of the top plate in position for approaching the saws, the size of the section to be cut by the saws being determined by the relative position of the carriage and the side of the top plate with the saws. A plate 33 is carried by the table in the same horizontal plane as the carriage and located between the car-

riage and the side of the top plate to form in conjunction with the carriage a complete support for the cake of ice while approaching the saws, said plate being divided beneath the horizontal saw to permit the cubes of ice to pass down into a chute 34, from which they can be suitably disposed of. In order to prevent the sections divided from the cake of ice from being carried back with the cake when the carriage is returned to its initial position, I provide a dog 35, which is pivotally supported in a slot 36 in the plate 33 beneath the horizontal saw, said dog normally projecting up through the slot, as shown in Fig. 3, and being depressed while the cake of ice is being pushed thereover, but immediately resuming its normal upward position after the cake has passed beyond its end to engage the section which has been cut off and prevent it returning with the cake on the carriage. The space bounded by the plate 33 on the bottom, the side of the top plate 32 on one side, the horizontal saw 24 on the top, and the upright saw 23 on the other side determines the size and shape in cross-section of the section divided by the saws from the cake of ice, and in order to provide for changing the size and shape of these sections I make the table adjustable vertically and provide a horizontally-adjustable guide-rail on the side of the top plate. The table is supported on the frame by means of arms 37 and 38, which have a pivotal connection with said table and the frame, and one of the arms 37 is continued in the form of a lever 37′ to travel adjacent to a locking-plate 39, provided with a series of holes 40. The table is adjusted vertically by operating this lever 37′, and when properly adjusted it is secured in place by means of some suitable locking device, such as a pin 41, which passes through an opening in the lever and one of the openings in the plate 39.

The guide-rail 42 consists, in effect, of a section cut out of the top plate, and it is connected by links 43 with the rigid part of the top plate. Between the rail and the top plate I provide a block 44, which can be adjusted to provide a solid backing for the rail when it is swung into adjusted position with relation to the upright saw 23, it being understood that the space between the face of this rail, which constitutes the side of the top plate and the upright saw, determines one dimension of the section or cube divided from the cake of ice, while the space between the plate 33 on the table and the horizontal saw determines the other dimension.

The carriage is provided with a horizontal rearward extension 45 above the top plate, which protects the operator from the saws, and this carriage comprises also a supplemental plate 46, provided with pins 47, which project upward through holes in the extension 45 and is provided with rollers 48, traveling on a track 49, whereby said plate travels back and forth with the carriage on a stationary support constituted by the track 49, the loose connection between said plate and the extension 45 permitting the carriage to be adjusted vertically without affecting the plate.

I contemplate dividing the cake of ice 50 by my machine first into sections *a b c*, &c., beginning at the lower inner corner of the cake and proceeding laterally across the bottom of the cake, the lower side of the cake resting upon the carriage and the lower side of the cut-out part left when one or more sections is removed, being supported upon the top plate 32 and the plate 46. The manner in which the cake is divided is illustrated in Fig. 5, and in Fig. 6 a number of the sections are shown arranged as they would be on the carriage to be cross-cut by the vertical saw to divide these sections into cubes or rectangular blocks of any desired shape.

The machine can be operated by hand or foot power, or a belt-wheel could be substituted for the hand-wheel 13 and power applied in a suitable manner. The carriage and guide-rail having been adjusted, a cake of ice is placed upon the carriage against the rail and the carriage is moved forward, forcing the cake against the revolving saws, which cut out a section *a* from the cake. This is discharged from the plate 33 at the forward end of the table into a receptacle suitably arranged and supported to receive the same and the subsequent sections cut out. After the first section has been cut out and delivered the carriage is returned to its initial position, the cake is pushed over laterally against the guide-rail, and the operation is repeated until the cake has been entirely divided into sections. A number of sections are then arranged side by side across the carriage, with their ends against the guide-rail, and the carriage is moved forward in the same manner as before to cross-cut the sections, as shown by dotted lines in Fig. 6, thereby dividing the sections into cubes or blocks, which drop through the opening between the two parts of the plate 33 and into the discharge-chute 34. It will be understood that I do not limit myself to producing blocks of ice in the form of cubes, as it is apparent that the adjustments for the carriage and the guide-rail will enable the production of blocks of ice in rectangular forms other than cubes. This operation can be conducted with rapidity and without danger, as it is only necessary for the operator to move the carriage back and forth and adjust the cake of ice on the carriage when the latter is in its initial position.

I am aware that changes in the form and proportion of parts and details of construction may be made without departing from the spirit or sacrificing the advantages of the invention, and I therefore reserve the right to make such changes as fall within the scope of the invention.

The blocks of ice, whether in the form of

cubes or in other forms, can be produced with this machine without wasting any of the ice, and they can be made in different sizes for serving with different kinds of drinks, as may be desired. The blocks will retain their shape and are more convenient and attractive in appearance for the purpose intended than ordinary broken pieces. They can be packed in boxes or receptacles of any kind for use and will not freeze together.

It is apparent, of course, that the machine can be used for operating upon material other than ice, and while it is intended primarily for producing cubes or blocks of ice at the same time I do not limit myself to the use of the machine in connection with material of any particular kind. I consider that the most satisfactory result is obtained by arranging the saws at right angles to each other in the manner shown in the drawings; but the saws may be arranged to operate at an angle greater or less than a right angle, and it will be understood that in the description and in the claims I refer to the saws being arranged at right angles to each other only as the preferred construction.

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

1. In a machine of the character described, the combination of a pair of circular saws arranged at right angles to each other and means for operating the same, a carriage for supporting and carrying the material into operative engagement with the saws, a side guide for the material, a plate located inside of the vertical plane of the upright saw and beneath the horizontal saw, and a dog carried by said plate and adapted to prevent that part of the material which has been separated from returning with the carriage, substantially as described.

2. In a machine of the character described, the combination of a pair of circular saws arranged at right angles to each other and means for operating the same, a carriage for supporting and carrying the material into operative engagement with the saws, a plate on which the material carried by the carriage slides, and a horizontally-adjustable guide-rail on said top plate, substantially as described.

3. In a machine of the character described, the combination of a pair of circular saws arranged at right angles to each other and means for operating the same, the top plate, a carriage for supporting and carrying the material on one side of the top plate and into operative engagement with the saws, an end guard for said carriage, and a plate on the opposite side of the top plate arranged to travel with the carriage, substantially as described.

4. In a machine for sawing cakes of ice into cubes or blocks, the combination of a traveling carriage for supporting the cake of ice, which projects over one side edge thereof, a fixed plate for supporting this projecting portion of the cake of ice, an adjustable side guide on the plate, an upright circular saw operating between said plate and the carriage and a horizontal circular saw operating above the side guide, substantially as described.

5. In a machine of the character described, the combination of a top plate, a pair of circular saws arranged at an angle to each other, and means for operating the same, a carriage provided with a horizontal rearward extension above the top plate, and a supplemental plate loosely connected to said extension and traveling with the carriage on the opposite side of the top plate, substantially as described.

6. In a machine of the character described, the combination of a frame, saw-shafts journaled in bearings in said frame and carrying circular saws and driving-pinions, a driving-shaft and means for operating the same, a gear-wheel mounted on said driving-shaft and meshing with the pinions on the saw-shafts, a top plate in the same plane with one of the saws, a carriage traveling adjacent to the other saw, and a side guide on the top plate within the cutting-lines of the saws, substantially as described.

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