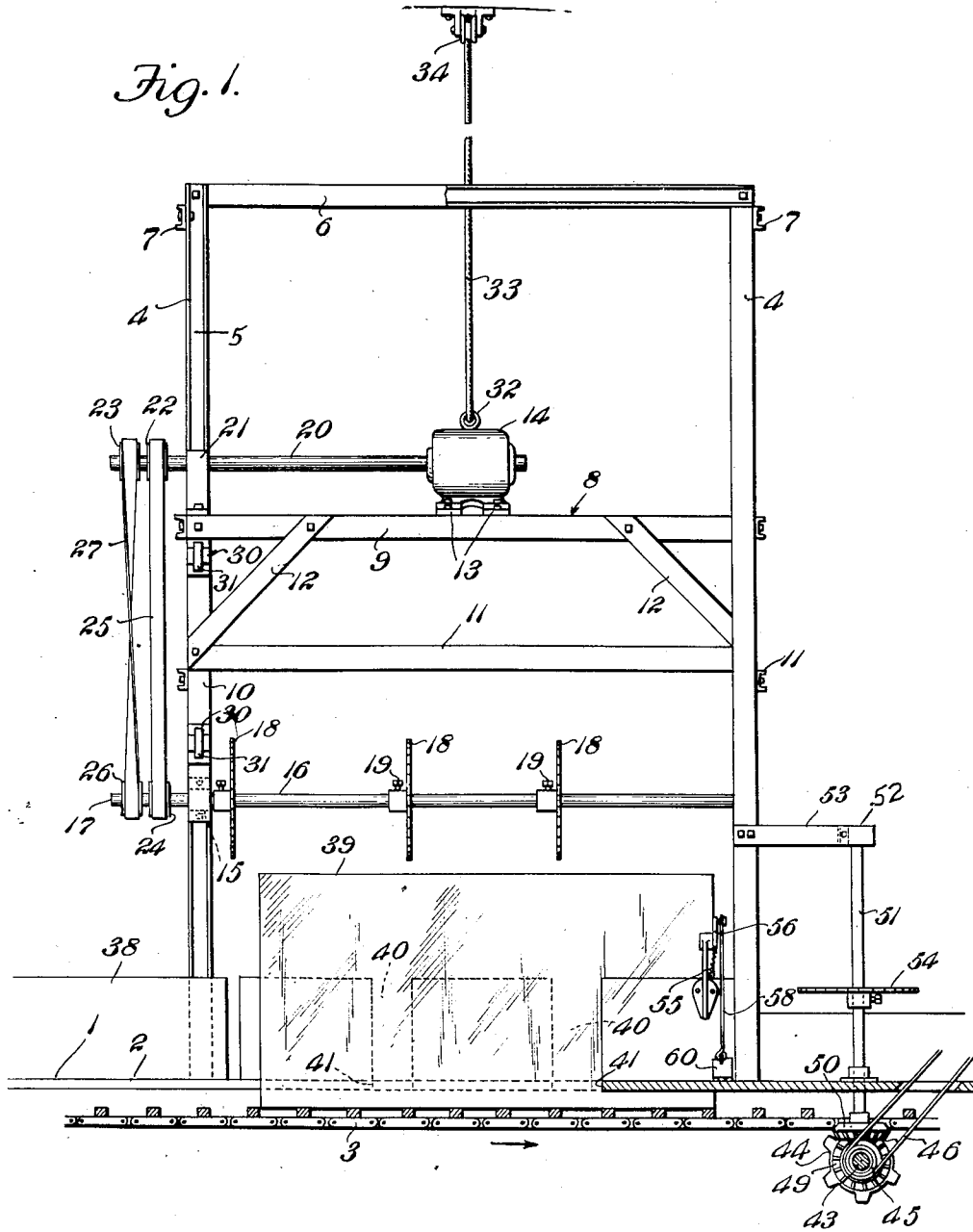


R. H. HURFORD.
ICE CUTTING MACHINE.
APPLICATION FILED APR. 4, 1919.

1,336,563.

Patented Apr. 13, 1920.

2 SHEETS—SHEET 1.



Inventor

Ross H. Hurford,

By

J. A. Bishop

Attorney

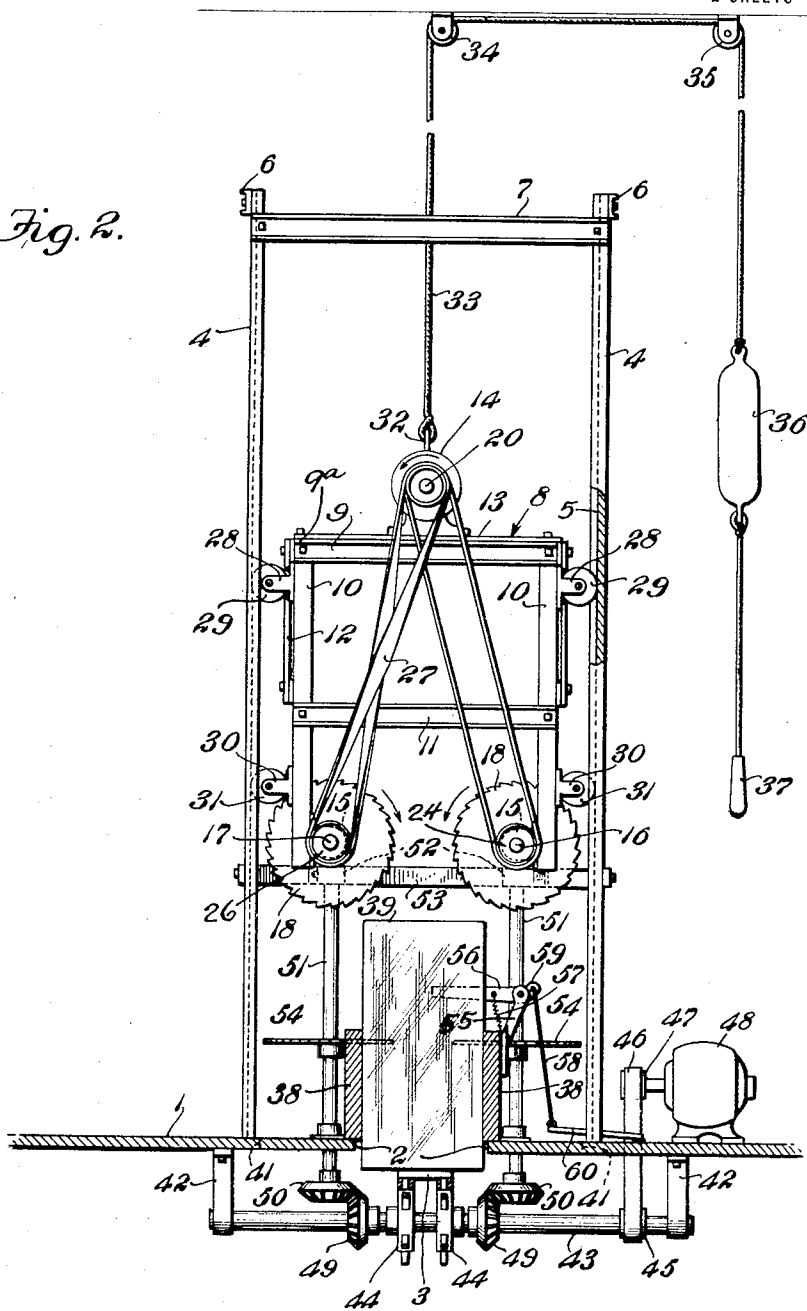
1,336,563.

R. H. HURFORD.
ICE CUTTING MACHINE.
APPLICATION FILED APR. 4, 1919.

Patented Apr. 13, 1920.

2 SHEETS—SHEET 2.

Fig. 2.



Inventor
Ross H. Hurford,

By J. A. Bishop

Attorney

UNITED STATES PATENT OFFICE.

ROSS H. HURFORD, OF CANTON, OHIO.

ICE-CUTTING MACHINE.

1,336,563.

Specification of Letters Patent.

Patented Apr. 13, 1920.

Application filed April 4, 1919. Serial No. 287,488.

To all whom it may concern:

Be it known that I, ROSS H. HURFORD, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Ice-Cutting Machine, of which the following is a specification.

This invention relates to ice cutting machinery and especially to a machine of this class designed to cut a block of artificial ice so that it may be easily and quickly separated into smaller blocks of a predetermined weight.

The object of this invention is to construct a machine of the class referred to that will quickly and accurately form kerfs at predetermined points on a block of artificial ice, so that the block may afterward be easily separated into smaller blocks for handling or distribution.

Another object is to arrange the cutting members so that they may be adjusted to any desired predetermined point to accommodate large blocks of various sizes.

A still further object is to greatly simplify this class of machinery and thereby reduce its cost of manufacture and maintenance.

With these objects in view the invention consists in the novel construction and arrangement of parts, hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of construction may be made within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:

Figure 1 is a side elevational view of my machine with a portion of the supporting frame and guide for the ice blocks broken away for the purpose of revealing details of construction.

Fig. 2 is an end elevation of my machine. Similar numerals of reference indicate corresponding parts throughout the several figures of the drawings.

At 1 I have shown the floor of the room or building in which my machine will be erected. Formed in the floor is a longitudinal passage-way 2 of approximately the width of one of the blocks of ice which will be conveyed to the machine for cutting. Lo-

cated beneath the passage-way 2 and in alinement therewith is an endless conveyer 3 of the well known sprocket chain construction which is designed to move constantly, when the machine is in operation, in the direction indicated by the arrow in Fig. 1.

Mounted upon the floor 1 are four upright members shown at 4, which members are formed of channel iron or the like, the groove of the channels being toward the center as shown at 5, in Fig. 2. These channels are for a purpose to be hereinafter more fully explained. Suitable brace members 6 connect the side pairs of uprights 4 and similar brace members 7 extend across the ends, these members 6 and 7 being rigidly bolted near the top extremities of the uprights, thus forming a rigid structure.

Movably suspended between the uprights 4 is a carriage member which I have generally indicated at 8, the said carriage member consisting of a rectangular frame 9 with a downwardly projecting member 10 at each corner thereof. Suitable longitudinal braces 11 connect the members 10 together and with diagonal brace pieces 12, form a rigid structure. Extending longitudinally across the upper side of the carriage 8 is a pair of spaced supports 13, which supports are securely bolted to the longitudinal members 9 of the rectangular structure 9. These brace members 13 are arranged substantially centrally, from end to end, of the longitudinal structure 9 and mounted midway of the ends of the members 13 is an electric motor 14. It will be seen from the foregoing that the motor 14 will be at the exact geometrical center of the rectangular member 9.

Formed at the lower extremity, at the inside of each of the members 10 is a bearing 15, opposite pairs of bearings being arranged in alinement, the pair at one side of the said carriage having mounted therein the shaft 16 and the pair at the opposite side of the carriage carrying the shaft 17. Adjustably mounted upon each of the shafts 16 and 17 is a plurality of circular saws which are held in position upon the shaft by set screws 19 or other well known means. Reference to Fig. 2 will disclose that the teeth of the saws upon the shaft 16 are set at the reverse position to those on the saws upon the shaft 17 so that each of the sets of saws in order to cut properly must be

rotated in the direction indicated by the respective arrows in Fig. 2.

Extending from the motor 14 is a shaft 20 which is supported near its extremity in a suitable bearing 21 and carries adjacent its free end a pair of pulleys 22 and 23. Arranged in direct alinement with the pulley 22 is a similar pulley 24 carried by the shaft 17 and a belt 25 connecting the said pulleys 22 and 24 is designed to drive the shaft 16 and the saws mounted thereon in the same direction in which the motor is rotated, this direction being shown in Fig. 2 by the arrow upon the motor 14. Reference to Fig. 1 will disclose that the shaft 17 is slightly longer than the shaft 16 and carries adjacent its extremity, a pulley 26 similar to the pulley 24 on the shaft 16, the said pulley 26 being arranged in direct alinement with the pulley 23 on the shaft 20 and a belt 27 twisted as clearly shown in the drawings connects the pulleys 23 and 26. It is obvious that the twisting of the belt 27 will cause the shaft 17 and the saws carried thereon to be rotated in a direction opposite to the direction of rotation of the motor 14 and shaft 16.

Secured to the outer side of each of the members 10 at a point adjacent its upper extremity, is a bracket 28 in which is rotatably mounted an anti-friction roller 29, the said roller 29 engaging and fitting snugly within the groove 5 of the adjacent upright member 4. Similar brackets 30 carrying rollers 31 are mounted near the lower extremity of each of the members 10, the rollers 31 also fitting within the channel of the adjacent uprights. It will be seen by reference to Fig. 2 that the carriage 8 will be firmly supported against side sway and at the same time will be free to move vertically within the structure composed of the standards 4. Secured to any suitable point of support, such for instance as the ring 32 in the motor 14, will be one extremity of a flexible cable or chain such as shown at 33, which flexible member will extend upwardly and over a suitable pulley 34 secured to a proper support, such as the ceiling. The cable extends thence laterally and over a second pulley 35 and thence downwardly and carries a counter-weight such as 36, which counter-weight is intended to balance the weight of the carriage 8 and the mechanism carried thereby. An operating cord or handle 37 may be attached to the lower end of the counter-weight and arranged within easy reach of the operator of the machine.

Arranged at either side of the passage-way 2 formed in the floor 1 is a vertical guide member 38, which guide members are spaced apart the exact distance of a block of ice such as will be cut on this machine, the said block of ice being indicated at 39. Spaces shown at 40 in Fig. 1, will be formed

in the guide members 38 in direct vertical alinement with the saws carried by the shafts 16 and 17 and in alinement with the spaces 40 will be formed notches 41 in the floor 1, the said spaces 40 and notches 41 being for a purpose to be hereinafter more fully set forth.

Mounted beneath the floor 1 is a pair of suitable bearing brackets 42 in which are rotatably mounted a horizontal shaft 43 which extends laterally beneath the passage-way 2 as clearly shown in Fig. 2 and has fixedly secured thereto suitable sprockets 44 which are arranged to mesh with the sprocket chain sections of the endless conveyer 3 and to drive said conveyer as the shaft is rotated. A pulley 45 mounted on the shaft 43 is designed to carry a belt 46 which also runs over a pulley 47 mounted upon a motor 48 located at a convenient and proper point for the purpose. Adjacent the outer sides of each of the sprockets 44 and mounted upon the shaft 43 is a beveled pinion 49 which pinions mesh with similar beveled pinions 50 fixed to the lower extremities of vertical shafts 51, the upper ends of which are rotatably mounted in suitable bearings 52 carried by a supporting arm 53 secured to the uprights 4 at one end of the machine. Adjustably secured to each of the shafts 51 is a circular saw 54, which saws are designed to be located at the exact vertical center of the blocks of ice to be cut by the machine.

Fastened to the outside of one of the vertical guide members 38 adjacent the outlet or discharge end of my machine, is a bracket 55 in which is pivotally mounted an arm 56 which arm is designed to be normally held in horizontal position by a spring 57, and, as shown in Fig. 2 to lie across the path of travel of the ice blocks. A rod or cable 58 secured through an eye 59 in the pivoted arm, will be attached to a pedal 60 arranged within convenient reach of the operator. It will be obvious that when the pedal 60 is depressed the arm 56 will be swung upwardly against the tension of the spring 57 and out of the path of travel of the ice blocks.

The operation of my machine will be as follows: We will assume that standard three hundred pound blocks of artificial ice are to be cut into fifty pound blocks for household use. The said three hundred pound blocks of ice on being brought from the storage room will be slid upon the conveyer 3 and start to travel toward the machine between the upright guide members 38. When a block of ice has reached the arm 56 which lies across its path of travel it will be forced to stop and will then be held in the position shown in the drawings beneath the carriage 8. A stop exactly similar to the stop 56 will be located at any convenient point to intercept and hold the next block of ice moving

down the conveyer. This stop being exactly similar in detail and operation to the stop shown and described has been omitted from the drawings since it would not appear on either of the figures and a detail illustration is thought to be superfluous. Two of the saws 18 upon each of the shafts 16 and 17 have previously been positioned to strike the block of ice at exact thirds of its greatest length. Current being supplied to the motor 14 will cause it to rotate and drive the saws in the directions shown by the arrows in Fig. 2. The operator will now elevate the counter-weight 36 and allow the carriage 8 to slide downwardly within the grooves 5 and bring the rotating saws 18 into contact with the block of ice. The carriage travels downwardly until the saws have passed completely down the sides of the block of ice. This is permitted by the spaces 40 and notches 41 formed in the upright guides 38 and the floor respectively. It will be noted by reference to Fig. 2 that the saws 18 are spaced apart so that in making the descent the block of ice will only be cut to a depth of about two and one-half or three inches from either side, the kerfs thus formed marking the block into three equal sections of one hundred pounds each. When the saws have traveled completely down across the block of ice, the operator by exerting a pull upon the handle 37, will, with the aid of the counter-weight 36 lift the carriage once more to the position shown in Fig. 2. Pressure is now applied to the pedal 60 to lift the arm 56 so that it will no longer remain in the path of travel of the block of ice and since the conveyer 3 has been continuously operating under the block of ice during the sawing operation, the said block of ice will once more begin to travel with the conveyer. On emerging from beneath the carriage 8 the ice block is brought between the rotating saws 54, one of which is mounted at either side of the path of travel of the ice. As previously set forth the saws 54 are positioned at the exact vertical center of the ice block and as the said ice block passes between them a kerf is formed longitudinally the entire length of the block thus marking the block into six equal blocks of fifty pounds each. As soon as the block of ice which has been marked has passed from beneath the carriage 8, the pressure is removed from the pedal 60 and the arm 56 allowed to drop and lie once more across the path of travel of the ice blocks, so that the next block will be stopped and held in position for the cutting operation.

It will be obvious from the foregoing description that the standard three hundred pound ice blocks can be quickly and accurately cut before being placed on the wagons or trucks for distribution so that the deliveryman operating the wagon or truck will

be saved a very considerable amount of time in cutting the three hundred pound blocks into fifty or one hundred pound sizes for household distribution. By cutting partially through the ice block from either side at points in direct alinement with each other, the ice block may be very readily severed by the ordinary ice hatchet, without danger of the blocks splitting in a direction not desired and thus either spoiling the section of ice chopped off or necessitating trimming down to the size desired. It will be understood that the saw blades used for thus cutting the ice will be very thin steel and the kerf or cut formed thereby will be proportionately narrow. The ice therefore will not melt at the points marked by the saws and permit the block to break apart while on the wagons or during handling.

Reference to Fig. 1 will disclose that at the left of the shaft 16 is shown an apparently idle saw 18. A similar idle saw is carried by the shaft 17 and it is therefore in direct alinement with the saw on the shaft 16, shown. These idle saws will be brought into use when standard four hundred pound blocks are to be cut by the machine. The saws 18 will then be moved to the proper points to sever the block at three places instead of two as shown when the three hundred pound blocks are being cut. The saws 54 may like-wise be adjusted to strike the four hundred block at its center.

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

1. In an ice cutting machine, a carriage vertically movable in a straight line, a plurality of rotating saws carried by said carriage, a conveyer operating in alinement beneath said carriage and designed to bring a block of ice in position to be cut, means for checking and holding said block of ice stationary in such position and means for lowering the carriage to permit the rotating saws to cut the said block of ice during said lowering operation.

2. In a machine for cutting ice, a carriage vertically movable in a straight line, a pair of spaced rotating shafts carried by said carriage, a plurality of vertical saws mounted on each of said shafts and rotatable therewith, means for positioning and holding a block of ice beneath said carriage and saws and in alinement between said shafts and means for lowering said carriage to permit said saws to cut two sides of the block of ice simultaneously during said lowering operation.

3. In a machine for cutting ice, a plurality of vertically movable, rotating, vertical saws and a plurality of stationary, rotating, horizontal saws, means for holding a block of ice in position beneath said vertical saws, means for lowering said vertical saws to cut

the block of ice vertically and means for passing said block of ice between said stationary saws to cut the said block horizontally.

- 5 4. In a machine for cutting ice, a plurality of vertically movable vertical saws and a plurality of stationary horizontal saws all of said saws rotating, means for positioning a block of ice beneath said vertical saws, means for lowering said movable
10 saws to cut the block of ice vertically and means for passing said block between said stationary saws to cut said block horizontally.
- 15 5. A machine for cutting ice comprising an upright frame, a carriage vertically movable within said frame, oppositely rotating

sets of vertical saws carried by said carriage, a conveyer, for bringing the block of ice to be cut into position beneath said carriage and centrally of said sets of rotating saws, means for holding said ice block in such position, means for moving said carriage vertically and causing said saws to cut oppositely disposed kerfs in said block, a pair of spaced stationary horizontal rotating saws and means for releasing said block, the said conveyer passing said block between said stationary saws to cut oppositely disposed kerfs in said block, at right angles to said first cut kerfs. 20 25 30

In testimony that I claim the above, I have hereunto subscribed my name.

ROSS H. HURFORD.