July 7, 1931. J. Q. DAUGHERTY 1,813,149

ICE SCORING MACHINE

Filed Sept. 9, 1930 4 Sheets-Sheet 1

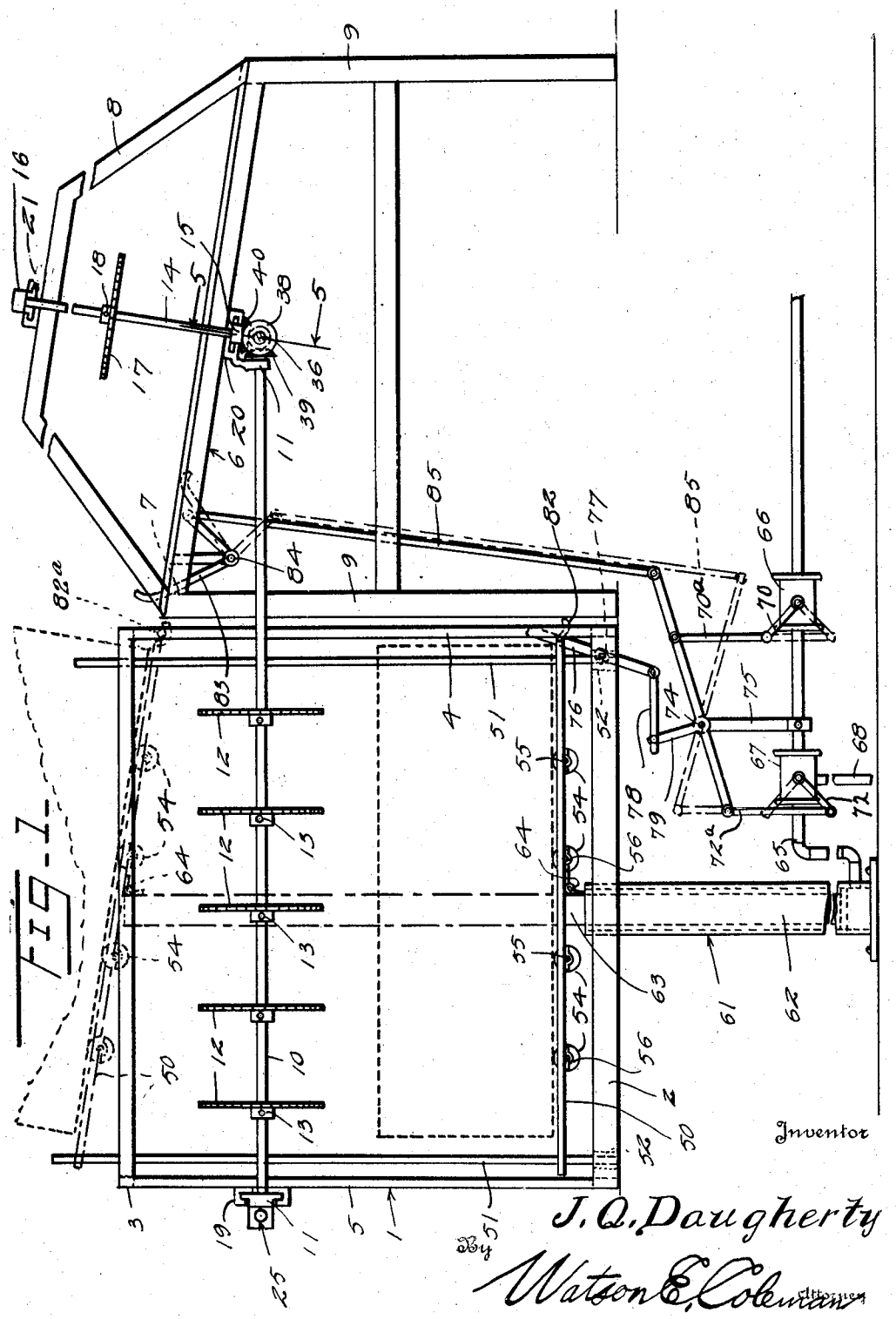


FIG. 1

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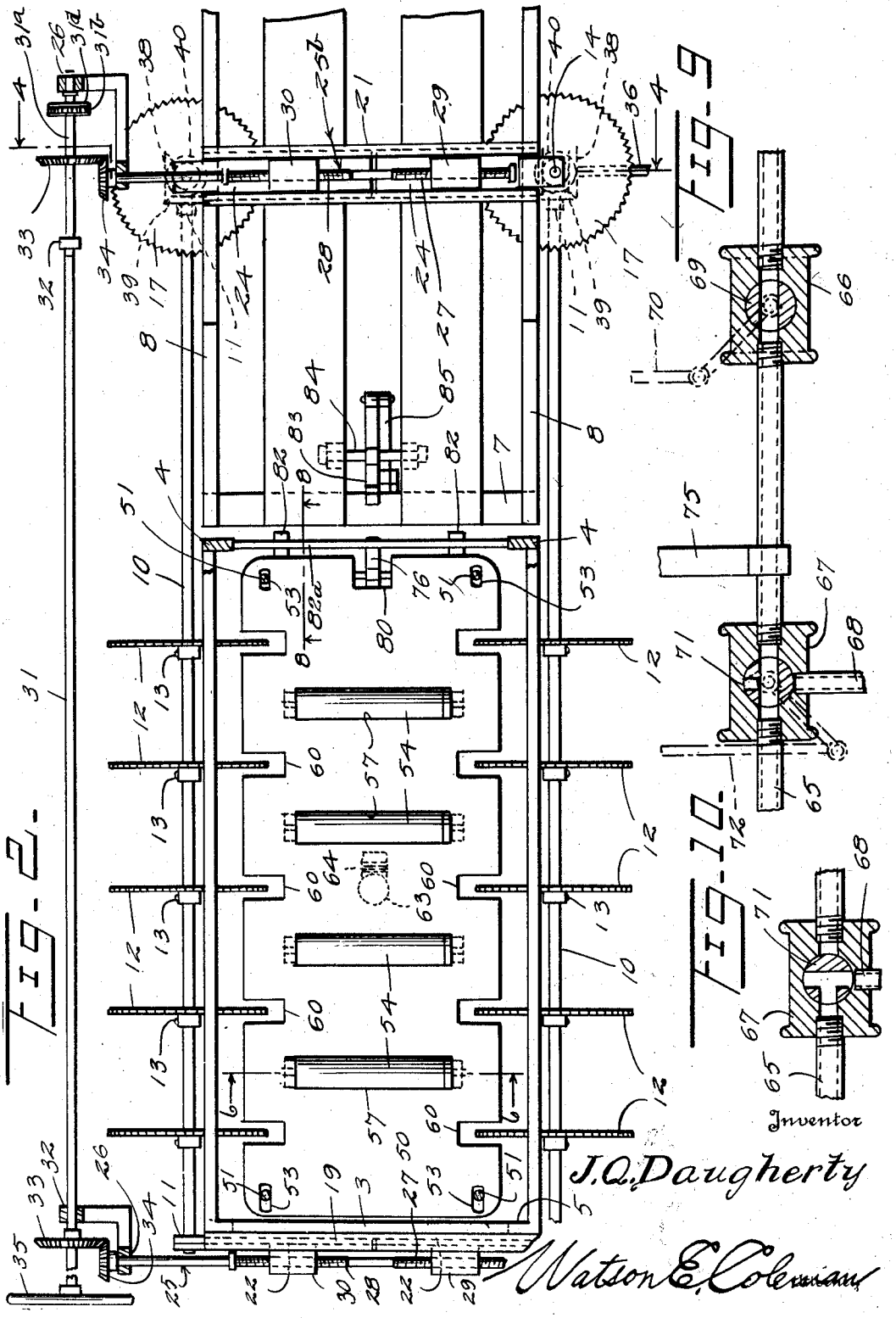


FIG. 2.

FIG. 9.

FIG. 10.

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ICE SCORING MACHINE

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Fig. 3.

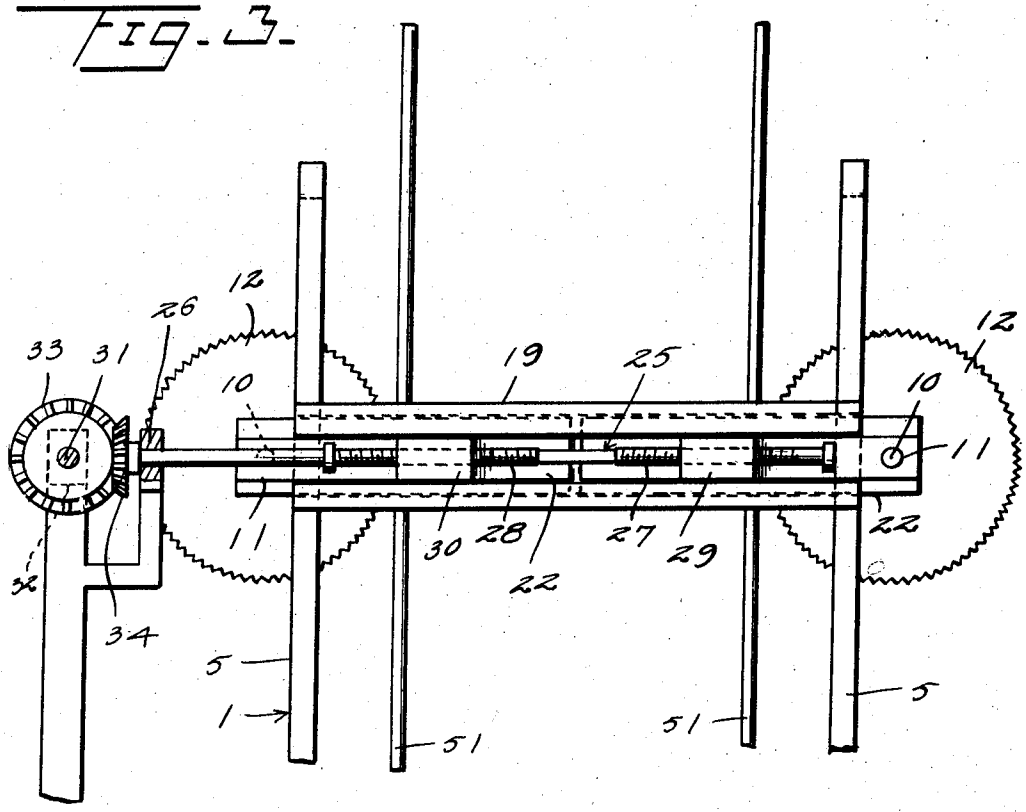


Fig. 6.

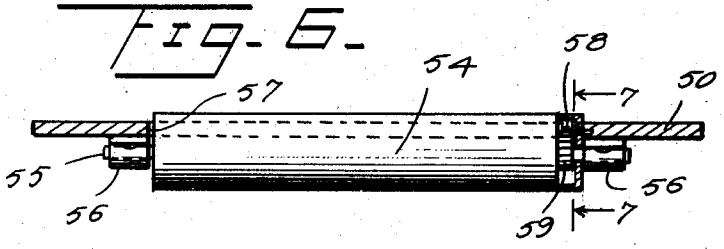


Fig. 8.

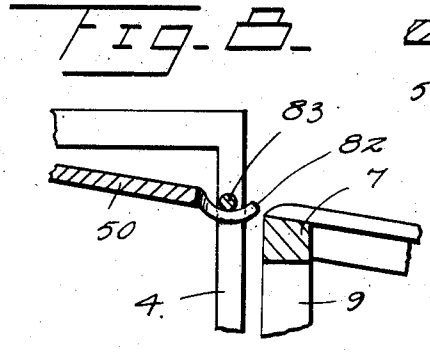
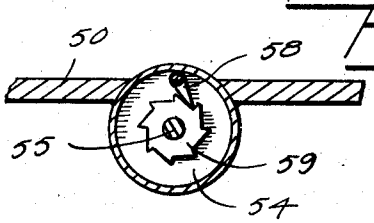


Fig. 7



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ICE SCORING MACHINE

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Fig. 4.

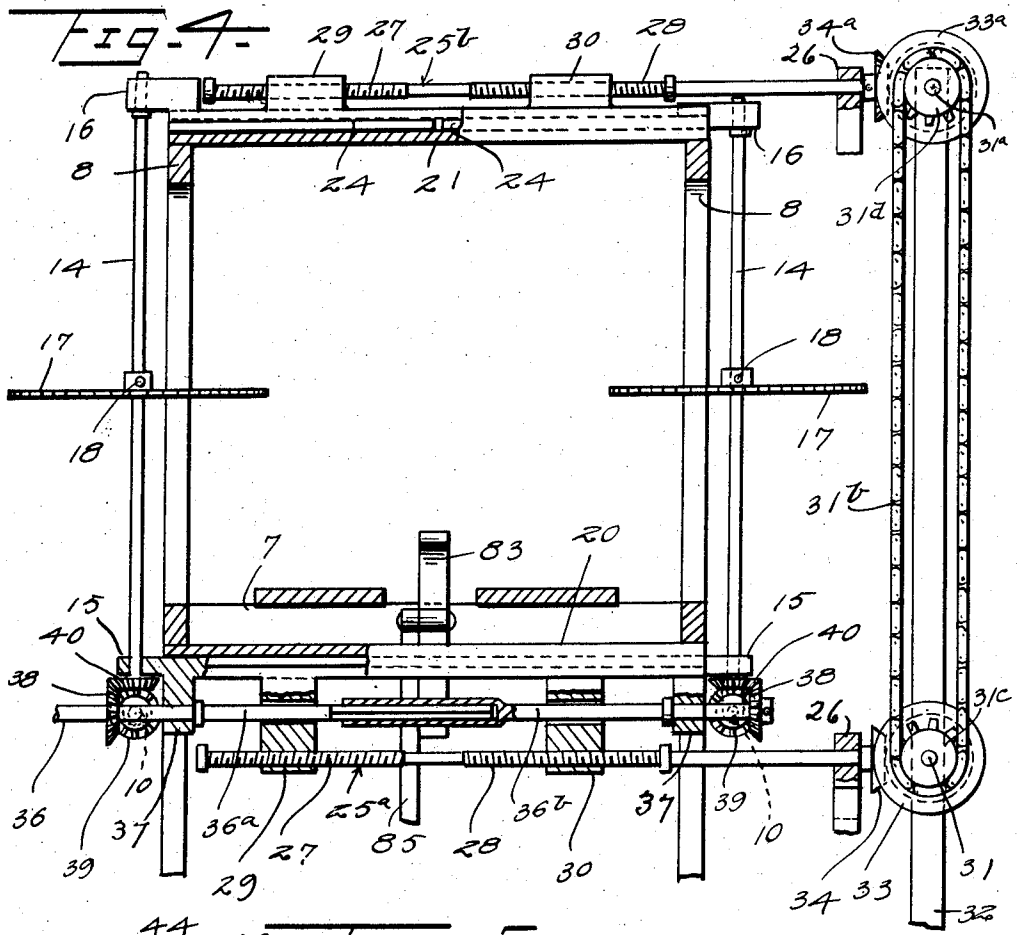
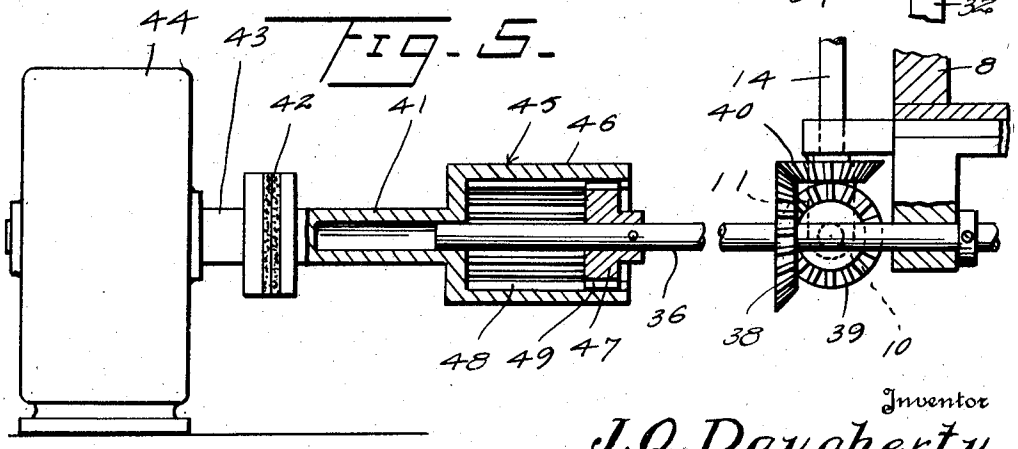


Fig. 5.



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Patented July 7, 1931 1,813,149

UNITED STATES PATENT OFFICE

JOHN Q. DAUGHERTY, OF ELECTRA, TEXAS

ICE SCORING MACHINE

Application filed September 9, 1930. Serial No. 480,752.

This invention relates to an ice scoring machine, and has for one of its objects to provide a novel, simple and highly efficient machine of this character which, while adapted to be used in the cutting room or on the dock of an ice manufacturing plant, shall be especially adapted to be arranged between the ice dump and the storage room of the plant, to the end that the blocks of ice may be scored while being transferred from the dump to the storage room.

The invention has for a further object to provide a machine of the character stated which shall be adapted to raise the blocks of ice from the dump and then discharge them into the storage room, and which shall be adapted to transversely score the sides of the blocks of ice while they are being raised from the dump, and which shall be adapted to longitudinally score the sides of the blocks of ice while they are being discharged into the storage room.

The invention has for a further object to provide a machine of the character stated which shall embody scoring elements adapted to be rendered ineffective, to the end that the machine may be employed for the purpose of transferring the blocks of ice from the dump to the storage house without scoring them.

The invention has for a still further object to provide a machine of the character stated which shall be adapted to be readily controlled by the person pulling the blocks of ice, to the end that such person may render the scoring elements effective or ineffective, depending upon whether it is desired to score the blocks of ice or to transfer them to the storage room without being scored.

With the foregoing and other objects in view, the nature of which will appear as the description proceeds, the invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in side elevation of an ice scoring machine constructed in accordance with my invention;

Figure 2 is a top plan view of the machine;

Figure 3 is a view in rear elevation of the upper portion of the machine;

Figure 4 is a sectional view taken on the vertical planes indicated by the line 4—4 of Figure 2;

Figure 5 is a view partly in elevation and partly in vertical section of a portion of the scoring saw driving means;

Figure 6 is a sectional view taken on the vertical plane indicated by the line 6—6 of Figure 2;

Figure 7 is a sectional view taken on the vertical plane indicated by the line 7—7 of Figure 6;

Figure 8 is a sectional view taken on the vertical plane indicated by the line 8—8 of Figure 2;

Figure 9 is a view partly in vertical section and partly in elevation of a part of the means for controlling the supply of pressure fluid to the platform elevating motor, with the supply valve and drain valve adjusted to admit pressure fluid to the motor, and

Figure 10 is a sectional view illustrating the drain valve in position to permit the escape of pressure fluid from the motor.

The machine comprises a main frame 1 which is of elongated rectangular formation in plan and consists of a base frame 2, a top frame 3, and front and rear corner uprights 4 and 5, respectively. The front end of the top frame 3 is fully open. A chute 6 extends downwardly and forwardly from the front end of the main frame 1. The chute 6, which comprises a slotted bottom 7 and sides 8, is supported by legs 9 with the upper or rear end of its bottom located slightly below the open front end of the top frame 3.

Horizontal shafts 10 located at the sides of

the main frame 1 near the top thereof, extend from the front to the rear end of the frame, and are journaled in bearings 11. Circular saws 12 are fixed, as at 13, to the shafts 10. The saws 12 of each shaft 10 are arranged in relatively spaced relation, and the saws of one shaft are transversely alined with those of the other shaft.

Shafts 14 are arranged at the sides of the chute 6 in an upwardly and forwardly inclined position, and are journaled at their lower ends in bearings 15 and at the upper ends in bearings 16. A circular saw 17 is fixed, as at 18, to each of the shafts 14, and is arranged in a plane parallel to the upper surface of the bottom 7 of the chute 6.

A guide 19 extends across the rear end of the main frame 1, a guide 20 extends across the chute 6 at a point below the bottom of the chute, and a guide 21 extends across the chute at a point above the bottom thereof. Blocks 22 are slidably mounted in the guide 19 and carry the rear bearings 11 of the shaft 10, blocks 23 are slidably mounted in the guide 20 and carry the front bearings 11 of the shafts 10 and the lower bearings 15 of the shafts 14, and blocks 24 are slidably mounted in the guide 21 and carry the upper bearings 16 of the shaft 14.

The blocks 22, 23 and 24 are adjustable toward and away from the longitudinal center of the main frame 1 and chute 6, to the end that the saws 12 and 17 may be moved into and out of operative position. When the saws 12 and 17 are in operative position, they extend into the main frame 1 and chute 6, and when they are in inoperative position, they are located laterally beyond the frame and chute.

The blocks 22, 23 and 24 are adapted to be manually adjusted to move the saws 12 and 17 into either operative or inoperative position by screws 25, 25^a and 25^b, respectively, extending transversely of the main frame 1 and chute 6 and journaled in bearings 26 carried thereby. The screws 25, 25^a and 25^b are each provided with right hand screw threads 27 and left hand screw threads 28. The right hand screw threads 27 are arranged at one side of the longitudinal center of the main frame 1 and chute 6, and are engaged with nuts 29 secured to those blocks 22, 23 and 24 arranged at the same side of said center. The left hand screw threads 28 are arranged at the other side of the longitudinal center of the main frame 1 and chute 6, and are engaged with nuts 30 fixed to those blocks 22, 23 and 24 arranged at this side of said center. When the screws 25, 25^a and 25^b are turned in one direction, the blocks of the guides 19, 20 and 21 will be moved away from the longitudinal center of the main frame 1 and chute 6, with the result that the saws 12 and 17 will be moved into inoperative position. When the screws 25, 25^a and 25^b are turned in the opposite direction, the blocks of the guides 19, 20 and 21 will be moved in the direction of the longitudinal center of the main frame 1 and chute 6 with the result that the saws 12 and 17 will be moved into operative position.

The screws 25 and 25^a are adapted to be turned through the medium of a horizontal shaft 31 and the screw 25^b is adapted to be turned through the medium of a horizontal shaft 31^a arranged at one side of the main frame 1 and chute 6 and journaled in bearings 32 carried thereby. The shaft 31 is connected to the screws 25 and 25^a by bevel gears 33 fixed to the shaft and meshing with bevel gears 34 fixed to the screws. The shaft 31^a is connected to the screw 25^b by a bevel gear 33^a fixed to the shaft and meshing with a bevel gear 34^a fixed to the screw, and this shaft is driven from the shaft 31 by a sprocket chain 31^b passing about a sprocket wheel 31^c fixed to the shaft 31 and a sprocket wheel 31^d fixed to the shaft 31^a. The shafts 31 and 31^a are adapted to be turned through the medium of a hand wheel 35 fixed to the shaft 31.

A main shaft 36 extends transversely of the chute 6 beneath the bottom 7 thereof and comprises telescopically associated sections 36^a and 36^b slidably and rotatably mounted in bearings 37. The shaft 36 is connected to the shafts 10 and shafts 14 by bevel gears 38, 39 and 40. The gears 38 are fixed to the shaft 36, the gears 39 to the shafts 11 and the gears 40 to the shafts 14. A sleeve shaft 41 is mounted upon an end portion of the shaft 36, and is connected by a friction clutch 42 to the armature shaft 43 of an electric motor 44. The shaft 41 is connected by a notched clutch 45 to the shaft 36. The clutch 45 comprises a hollow cylindrical member 46 fixed to the shaft 41 and surrounding the shaft 36, and a member 47 fixed to the shaft 36 and arranged within the member 46 for axial movement with respect thereto. The clutch members 46 and 47 are provided with engaging teeth 48 and 49, respectively, to establish a driving connection between the shafts 41 and 36, to the end that the saws 12 and 17, when in operative position, may be rotated by the motor 44.

As the shaft sections 36^a and 36^b may be moved axially with respect to the shaft 41, and as the clutch member 47 may be similarly moved with respect to the clutch member 46, the driving connection between the shafts 41 and 36 will not interfere with the movement or adjustment of the saws 12 and 17 into inoperative position. When anything occurs that would tend to hold either the saws 12 or the saws 17 against rotation, the clutch 42 slips so as to avoid injury to the motor 44.

A platform 50 of elongated rectangular formation in plan is mounted in the main frame 1 for vertical movement with respect thereto, and is guided in its movement by

rods 51 which are arranged within the corners of the frame and secured thereto, as at 52, the platform being provided in its corners with slots 53 for the reception of the guide rods. The platform 50 when in its lowermost or normal position, is arranged within the base of the main frame 1, and when in this position, it is adapted to receive a block of ice. The block of ice is placed upon the platform with its longitudinal edges arranged horizontally, and during the upward movement of the platform it is carried between the saws 12 which form vertical scores in the sides thereof. The platform 50 then discharges the block of ice onto the chute 6, and during its movement down the chute, the saws 17 form longitudinal scores in the sides thereof, these scores being arranged at right angles to the vertical scores and centrally between the ends of the latter.

To permit the block of ice to be easily moved upon the platform 50, the latter is provided with rollers 54 which extend transversely thereof and are relatively spaced. The rollers 54 are carried by shafts 55 which are journalled, as at 56, to the underside of the platform 50, and the rollers extend upwardly through slots 57 formed in the platform. Pawls 58 pivoted to the platform 50 and engaging ratchet wheels 59 fixed to the rollers 54 permit the free forward rotation of the rollers while holding them against rearward rotation to the end that a block of ice may be moved onto the platform and held against rearward displacement therefrom. The platform 50 is provided with transverse slots 60 which open out through the longitudinal edges of the platform and receive the saws 12 during the upward movement of the platform.

The motor 61 arranged below and at the vertical center of the main frame 1 is adapted to raise the platform 50. The motor 61 is adapted to be operated by any suitable pressure fluid such for instance as steam, air or water, and comprises a fixed vertical cylinder 62 and a vertical ram 63 slidable in the cylinder. The platform 50 rests at its center upon the upper end of the ram 63, and is connected to the front side of the ram by a hinge 64 to permit the platform 50 to tilt downwardly and forwardly when it reaches its uppermost position. When the platform 50 reaches this position, it discharges the cake of ice therefrom onto the chute 6. A pipe 65 extending from the source of pressure fluid, not shown, communicates with the lower end of the cylinder 62, and arranged therein is a supply valve 66 and a drain valve 67. The drain valve 67 is arranged in the pipe 65 between the cylinder 62 and the supply valve 66 and has extending therefrom a discharge or drain pipe 68.

The plug 69 of the supply valve 66 is provided with an arm 70 and the plug 71 of the drain valve 70 is provided with an arm 72. The arms 70 and 72 are connected by links 70^a and 72^a to the ends of a lever 73 pivoted intermediate its ends, as at 74, to a bracket 75 carried by the pipe 65. The connection between the levers 73 and the plugs 69 and 71 is such that, when the lever is rocked in one direction, the supply valve 66 is opened and the drain valve 67 is operated to establish communication between the cylinder 62 and valve 66 and to cut off communication between the cylinder and drain pipe 68. This connection is also such that, when the lever 73 is rocked in the opposite direction, the supply valve 66 is closed and the drain valve 67 is operated to establish communication between the cylinder 62 and the drain pipe 68. An upright lever 76 is pivoted between its ends, as at 77, to the front side of the base frame 2, and its upper end extends upwardly through this frame. The lower end of the lever 76 is connected by a link 78 to an arm 79 extending upwardly from the lever 73. The upper end of the lever 76 is located at the longitudinal center of the platform 50, and the front end of the platform is provided with an opening 80 for the reception of said end of the lever. The front end of the cake of ice moved upon the platform 50 contacts with the upper end of the lever 76 and moves it forwardly, with the result that the lever 73 is operated in a direction to open the supply valve 66 and to actuate the drain valve 67 in a manner to establish communication between the cylinder 62 and supply valve and cut off communication between the cylinder and drain pipe 68. The pressure fluid flowing into the cylinder 62 will raise the ram 63 and with it the platform 50 and the block of ice supported on the platform.

Immediately before the platform 50 reaches its highest position, lugs 82 extending forwardly from the front end of the platform contact with the underside of a fixed bar 82^a which is secured to and extends across the front end of the main frame 1. Further upward movement of the platform 50, due to the contact of the lugs 82 with the underside of the bar 82^a, results in the platform being tilted downwardly and forwardly. The bar 82^a is located slightly below the upper surface of the rear end of the bottom 7 of the chute 6, and the lugs 82 are slightly offset downwardly from the upper surface of the platform 50 so that when the platform is in tilted or ice block discharging position, the ice block will move by gravity from the platform onto the chute 6. The ice block will move by gravity from the chute 6 into the storage room, and during its movement through the chute will have longitudinal scores formed therein by the saw 17.

An elbow lever 83 is pivoted at the juncture of its arms, as at 84, to the rear end of the chute 6. The vertical arm of the lever 83 ex-

tends upwardly through the bottom 7 of the chute 6 and the horizontal arm thereof is connected by a link 85 to an end of the lever 73. During the passage of the ice block from the platform 50 onto the chute 6, the ice block contacts with the vertical arm of the lever 83, with the result that the lever 73 is rocked in a direction to close the supply valve 66 and to actuate the drain valve 67 in a manner to establish communication between the cylinder 62 and the drain pipe 68. This actuation of these valves frees the ram 63 and platform 50 for downward movement, and they move downwardly under their own weight until the platform reaches its normal or ice cake receiving position.

The armature of the motor 44 turns in but one direction, and in view thereof, the motor is adapted to be controlled by a single throw switch not shown.

It should be apparent from the foregoing description, taken in connection with the accompanying drawings, that the platform 50 normally occupies an ice receiving position, that the movement of a block of ice onto the platform results in the elevation of the platform by the motor 61, and that during the raising of the platform the block of ice is vertically scored by the saws 12. After the block of ice has been scored by the saws 12, the platform 50 is moved into its downwardly and forwardly inclined discharging position, with the result that the block of ice moves by gravity from the platform onto the chute 6. During the movement of the block of ice onto the chute 6, the valves 66 and 67 are operated to cut off the supply of pressure fluid to the motor 61 and drain the motor, with the result that the platform 50 is released for gravitation to ice receiving position. During its movement through the chute 6, the block of ice is horizontally scored by the saws 17, and after being thus scored, the block of ice moves into the storage room. If it is desired to use the machine for the purpose of transferring blocks of ice into the storage room without scoring the blocks, the motor 44 is stopped, and the saws 12 and 17 are moved into inoperative position by turning the hand wheel 35. The machine is entirely automatic in its operation, and may be readily controlled and adjusted to adapt it to transfer blocks of ice to the storage room and score them while being transferred or to adapt it to transfer blocks of ice to the storage room without being scored.

While I have described the principle of the invention, together with the structure which I now consider the preferred embodiment thereof, it is to be understood that the structure shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the invention as claimed.

I claim:—

1. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to receive a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, and means adapted to score the block of ice during the first phase of the raising movement of the platform.

2. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to receive a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, means adapted to score the block of ice during the first phase of the raising movement of the platform, and means adapted to score the block of ice during the passage thereof through the chute.

3. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to receive a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, shafts arranged at opposite sides of the path of movement of the platform, scoring

saws secured to the shafts, and means for rotating the shafts.

4. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to receive a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, shafts arranged at opposite sides of the path of movement of the platform, scoring saws secured to the shafts, shafts arranged at opposite sides of the chute, scoring saws carried by said last shafts, and means for operating all the shafts.

5. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to receive a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, shafts arranged at opposite sides of the path of movement of the platform, scoring saws secured to the shafts, shafts arranged at opposite sides of the chute, scoring saws carried by said last shafts, a main shaft geared to said first shafts, a motor, and a friction clutch establishing a driving connection between the motor and main shafts.

6. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to carry a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, scoring means arranged at opposite sides of the path of movement of the platform, scoring means arranged at opposite sides of the chute, means for operating the scoring means, and means supporting the scoring means for adjustment into operative or inoperative position.

7. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to carry a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, shafts arranged at opposite sides of the path of movement of the platform, shafts arranged at opposite sides of the chute, scoring elements carried by the shafts, means for rotating the shafts, and means supporting the shafts and operable for moving them to arrange the scoring elements in operative or inoperative position.

8. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to carry a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, shafts arranged at opposite sides of the path of movement of the platform, shafts arranged at opposite sides of the chute, a main shaft geared to said first shafts, means supporting the main shaft for rotation and endwise movement, a power shaft, a clutch connecting the main shaft to the power shaft to permit the latter to rotate the former and to permit the latter to move axially with re-

spect to the former, and means supporting said first shafts and operable to move the shafts to arrange the scoring elements in operative or inoperative position.

9. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to carry a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, means for controlling the operation of said raising means and adapted to be operated by the block of ice during its movement onto the platform to effect the operation of said raising means and adapted to be operated by a block of ice during its movement onto the chute to effect the stopping of said raising means, and means for scoring the block of ice during the raising thereof by the platform and during the passage thereof through the chute.

10. A machine of the character set forth, comprising a chute, a platform located rearwardly of the chute and adapted to carry a block of ice, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the block of ice when in said first position and adapted to discharge the block of ice therefrom onto the chute when in said second position, means for raising the platform from said first to said second position and adapted to support it horizontally during the first phase of the raising movement thereof, means adapted to move the platform into its inclined position during the second phase of the raising movement thereof, said raising means being adapted to release the platform for gravitation from said second to said first position, means under the control of the block of ice for starting and stopping said raising means and means adapted to score the block of ice during the raising movement thereof.

11. A machine of the character set forth, comprising a chute, an ice block carrying platform located rearwardly of the chute, means mounting the platform for movement from a horizontal plane located below the rear end of the chute to an inclined plane substantially coincident with the bottom of the chute, the platform being adapted to receive the ice block when in said first position and adapted to discharge the article therefrom onto the chute when in said second position, means for raising the platform from said first to said second position, rollers journaled on the platform, means adapted to prevent the rollers from rotating in a rearward direction, and means adapted to score the block of ice during the raising movement thereof.

In testimony whereof I hereunto affix my signature.

JOHN Q. DAUGHERTY.