No. 622,797. Patented Apr. 11, 1899.

C. H. EDMANDS.

ICE CUTTING MACHINE.

(Application filed Dec. 12, 1898.)

(No Model.) 2 Sheets—Sheet 1.

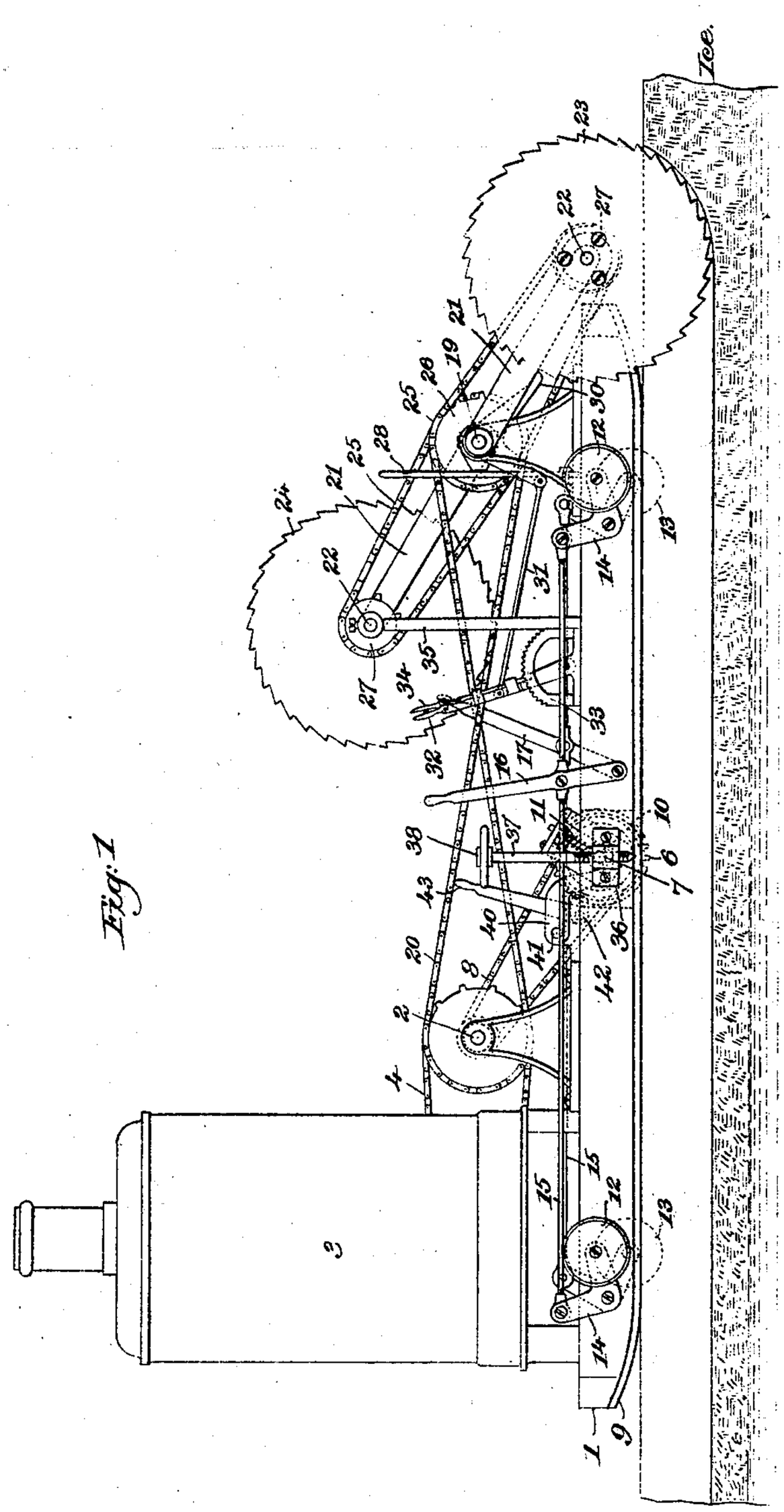

Fig. 1

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Inventor:
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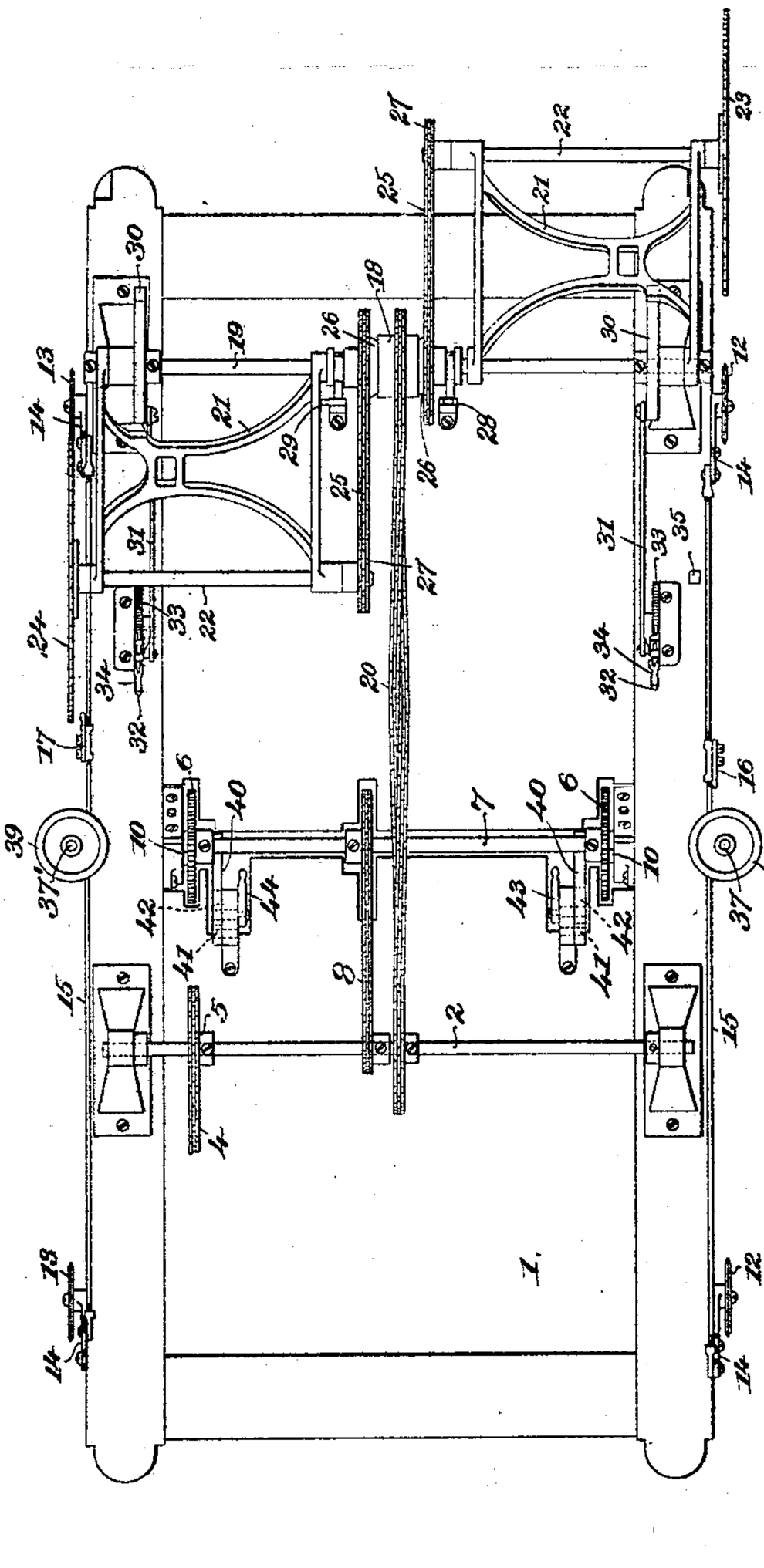
Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES H. EDMANDS, OF SAUGUS, MASSACHUSETTS.

ICE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 622,797, dated April 11, 1899.

Application filed December 12, 1898. Serial No. 699,031. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. EDMANDS, a citizen of the United States, residing a Saugus, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Ice-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an ice-cutting machine, and more particularly to an ice-cutting machine for sawing pond-ice into blocks of uniform size for storage and subsequent use.

The object of my invention is to make a machine which will cut the ice rapidly and uniformly, to provide it with a motor and mechanism to propel the machine, to drive the saws, and to turn the machine around at the edge of the pond, and capable of being operated and controlled by two men, thereby producing an economical, efficient, and compact machine which will do the work heretofore requiring twenty men and ten or twelve horses.

To the above ends my invention consists in the improvements in ice-cutting machines hereinafter described and more particularly pointed out in the claims.

In the drawings illustrating the preferred form of my invention, Figure 1 illustrates a side elevation, and Fig. 2 a plan, of my machine, the engine and boiler being omitted from the plan.

In the illustrated embodiment of my invention, 1 indicates a sledge which constitutes the support for the operative parts of the machine.

2 indicates the main shaft, mounted in suitable bearings and driven from the engine, hidden by the boiler 3, by a sprocket-chain 4, running over a sprocket-wheel 5, mounted on said main shaft 2. Spur-wheels 6, mounted upon the driving-shaft 7, driven by the sprocket-chain 8 from the main shaft 2, project down below the level of the runners 9 of the sledge 1 and by engagement with the surface of the ice propel the machine over the same. The driving-shaft is supported at its ends in sliding boxes 10, normally pressed downward by springs 11, for a purpose hereinafter described.

Upon each side of the sledge 1 are mounted two guide-wheels 12 and two guides-wheels 13, supported by bell-crank levers 14, pivoted upon the side of the sledge. The upwardly-projecting ends of the bell-crank levers are connected together by rods 15, attached, respectively, to the guide-operating levers 16 and 17, so that both of the guide-wheels on one side of the machine may be raised or lowered at the same time by one lever.

The main saw-driving sprocket-wheel 18 is rotatably mounted on a shaft 19, carried in suitable bearings near the front of the machine and driven by means of the sprocket-chain 20 from the main shaft 2. Pivotally mounted upon the shaft 19 are two swinging saw-frames 21 in suitable bearings, in the outer ends of which are rotatably supported the saw-shafts 22, carrying on their outwardly-projected ends steel saws 23 and 24. These saws are adapted to be driven by means of sprocket-chains 25, running over clutch-sprockets 26, loosely mounted upon the shaft 19 on opposite sides of the saw-driving sprocket 18 and sprockets 27, secured to the saw-shafts 22.

The opposite sides of the saw-driving sprocket 18 are provided with clutch-faces adapted to be engaged by clutch-faces on the adjacent sides of the clutch-sprockets 26, so that when one of the clutch-levers 28 or 29 is moved toward the saw-driving sprocket 18 the corresponding saw 23 or 24 will be rotated by the means described.

To regulate the depth of the groove to be cut by the saw I have provided each saw-frame with means for raising and lowering it. In the illustrated embodiment of this means for raising and lowering the saw-frames I have mounted bell-crank levers 30 upon the shaft 19, having one arm which is projected forward and upon which the frame is adapted to rest. To the other arm of the lever 30 I have attached a link 31, running to a hand-lever 32, by means of which the lever 30 may be oscillated and the saw thereby raised and lowered. The quadrant-rack 33, in conjunction with the spoon-lever 34 and detent mounted upon the hand-lever 32 in the usual manner, affords a convenient means of maintaining the saw in any desired position. The saw 23 is shown in position cutting a groove in the ice,

while the saw 24 is shown in its raised position, being supported upon one of two posts 35, provided for that purpose, and it will be observed that the direction of rotation of the saw when cutting is such as to lift the chips out of the groove and at the same time to hold the saw to its work, no pressure being required to hold the saw down.

Mounted in screw-threaded bearings 36, preferably located on the sides of the sledge in line with the driving-shaft 7, are two correspondingly-screw-threaded turning-posts 37 37′, provided with sharpened points on their lower and on their upper ends, respectively, with the hand-wheels 38 and 39, by means of which the turning-posts may be operated to raise and lower them. Any other suitable means might be provided for supporting and guiding the turning-posts and for raising and lowering them. I have also provided means for raising both of the spur-wheels 6 out of engagement with the ice, so that the machine may be easily moved from place to place on the pond, and, moreover, for lifting one of the spur-wheels out of contact with the ice when it is desired to turn the machine around at the end of its traverse across the pond. I preferably employ for this purpose the bent levers 40, pivoted at 41 and having their free ends projected under the shaft 7, which by means of cams 42, operated by the levers 43 and 44, respectively, lift the spur-wheels 6, so that by the former lever 43 the right-hand spur-wheel 6 may be lifted from the ice, and by means of the lever 44 the left-hand spur-wheel 6 can be lifted against the pressure of the springs 11. It will be observed that when the cam is vertical the corresponding lever 40 will be locked in its raised position.

The operation of my invention is as follows: I first cut a groove a few feet in length in the edge of the pond that it is desired to cut and then place the machine in proper position and lower, say, for example, the guide-rollers 12 into the groove by means of the hand-lever 16. The saw 24 will be in the position in which it is illustrated, and the saw 23 will be in position to cut. The spur-wheels 6 will be in contact with the ice, and the engine will then be started. The groove which has already been cut will compel the machine to travel in a straight line across the pond, and the saw will cut a groove into which the guide-rollers 12 will follow. At the end of the traverse across the pond the engine will be stopped and the saw 23 will be raised, and then the turning-post 37 will be screwed down into the groove of the ice by means of the hand-wheel 38. Then the right-hand spur-wheel 6 will be raised from contact with the ice, the guide-rollers 12 will be raised from out the groove by means of the hand-lever 16, and the engine will be started. As the left-hand spur-wheel 6 is still in contact with the ice and as the turning-post 37 is screwed down into the same, the rotation of the left-hand spur-wheel 6 will cause the machine to move in a circle about the turning-post 37. This motion will be continued until the machine has turned end for end, when the guide-rollers 12 will be again lowered into the same groove, the turning post 37 will be raised by the hand-wheel 38, and the saw 24 will be lowered into operative position and the machine again started for another traverse across the pond, cutting a groove parallel to the first groove and at the distance therefrom equal to the distance between the two saws and which in ordinary practice will be forty-four inches. Of course it is perfectly feasible to cut any other desired size of cakes by varying the proportions of the machine. At the end of this second traverse across the pond the engine will be stopped, the hand-wheel 39 operated to force its turning-post into the groove which has just been cut, the guide-rollers 12 will be raised by the lever 16, the saw 24 will be raised, the hand-lever 44 operated to raise the left-hand spur-wheel 6 from out of contact with the ice, when the engine will again be set in motion and the machine turned around into the position in which it first started across the pond. On this trip across, however, the guide-rollers 13 will be turned down into the groove and the saw 23 will cut the next succeeding groove. This operation will be repeated until the pond is entirely cut by parallel grooves, and then the grooves at right angles to the same will be cut in like manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. In an ice-cutting machine the combination with a frame and associated parts, of a propelling-wheel on one side of the frame and a turning-post on the other side of the frame, whereby when the turning-post is depressed, the propelling-wheel will turn the machine around, substantially as described.

2. In an ice-cutting machine, the combination with a frame and associated parts, of propelling-wheels on the sides of the frame, means for raising the propelling-wheel of one side independently of the propelling-wheel of the other side, turning-posts on the side of the frame, and means for depressing the turning-post on one side independently of the turning-post of the other side, whereby when one turning-post is depressed and the propelling-wheel on the same side therewith is raised, the propelling-wheel on the opposite side will turn the machine around, substantially as described.

3. In an ice-cutting machine, the combination with a frame, and associated parts, of propelling-wheels on the sides of the frame, means for raising the propelling-wheel of one side independently of the propelling-wheel of the other side, turning-posts on the sides of the frame, means for depressing the turning-post of one side independently of the turning-post of the other side, suitable guides on the sides of the frame, and means for rais-

ing and lowering the guide of one side independently of the guide of the other side, whereby when the guides are raised, one turning-post is depressed and the propelling-wheel on the same side therewith is raised, the propelling-wheel of the opposite side will turn the machine around, substantially as described.

4. In an ice-cutting machine, the combination with a frame and associated parts, of a pair of propelling-wheels, a pair of turning-posts, and means for raising one of the propelling-wheels out of contact with the ice so that the other shall coöperate with one of the turning-posts, to turn the machine around, substantially as described.

5. In an ice-cutting machine, the combination with a frame and associated parts, of a propelling-wheel, two pairs of guides mounted upon opposite sides of the frame, two turning-posts mounted respectively in line with the pairs of guides adapted to be depressed into the groove in the ice between the guides whereby the machine may be turned around said posts to a position parallel with and opposite to its original position, substantially as described.

6. In an ice-cutting machine, the combination with a frame and associated parts, of a pair of propelling-wheels, two pairs of guides mounted upon opposite sides of the frame, two turning-posts mounted respectively in line with the pairs of guides and adapted to be depressed into the groove in the ice between the guides, and means for raising one of the propelling-wheels out of contact with the ice, whereby the machine may be turned around said posts to a position parallel with and opposite to its original position, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES H. EDMANDS.

Witnesses:

T. HART ANDERSON,

HORACE VAN EVEREN.