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STARTING DEVICE FOR FLOATING ICE.

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1,281,331. Patented Oct. 15, 1918.

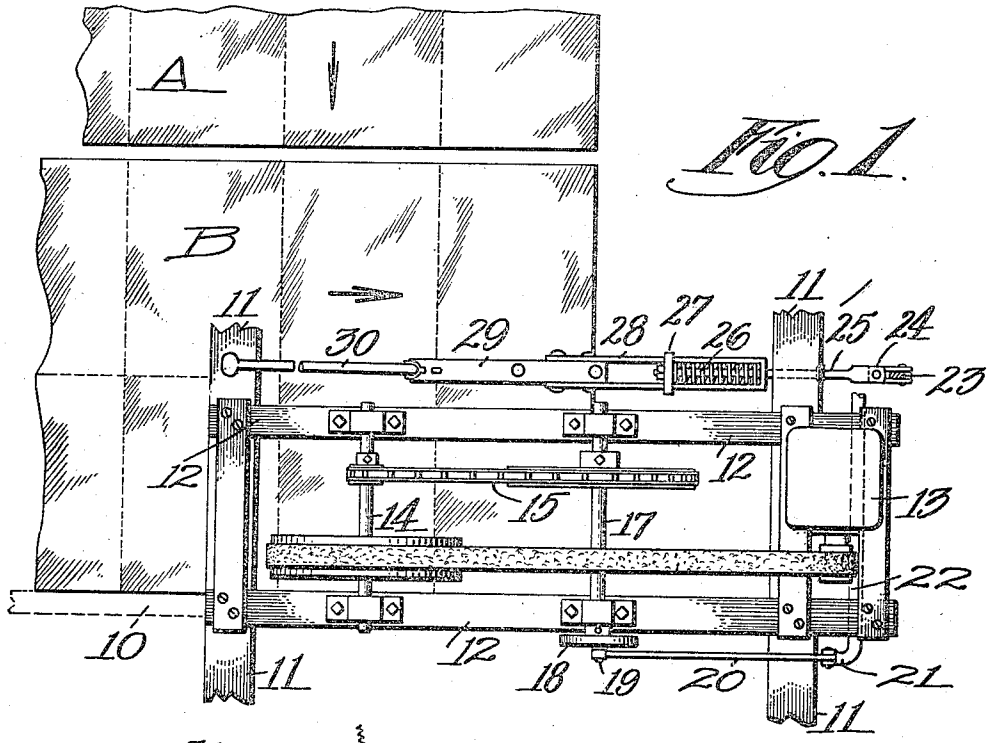


Fig. 1.

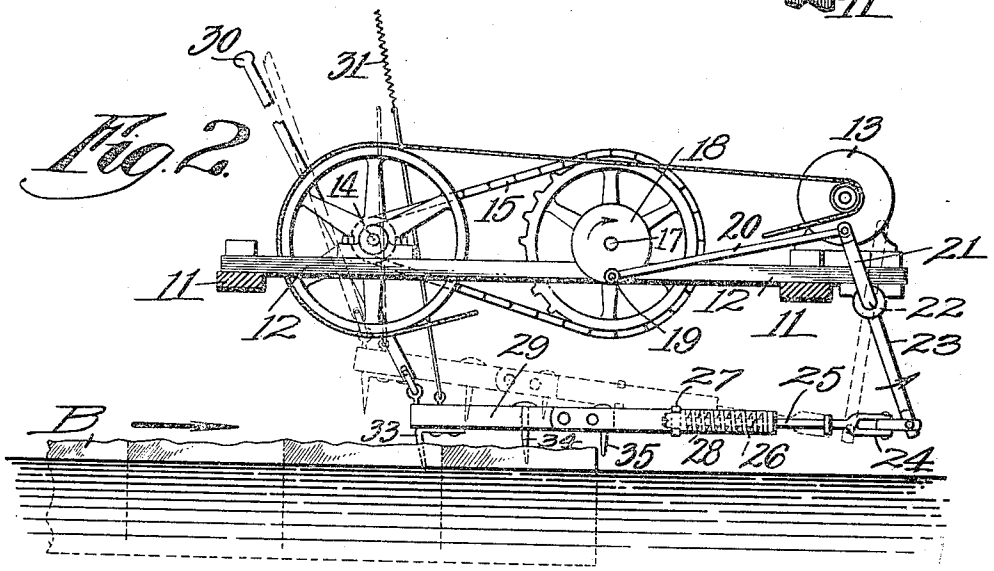


Fig. 2.

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STARTING DEVICE FOR FLOATING ICE.

1,281,331. Specification of Letters Patent. Patented Oct. 15, 1918.

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To all whom it may concern:

Be it known that I, EDWARD W. FLETCHER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Starting Device for Floating Ice, of which the following is a specification.

This invention relates to a device for starting floating ice and the principal objects thereof are to provide a mechanism for this purpose of an extremely flexible character, that is, of a character which permits of its employment for starting the ice slowly at first and more rapidly later as its momentum increases; to provide a construction in which the work of starting will be done mechanically but the control is entirely manual; and particularly to provide a device of this character which will do away with the work of several men, but will require only a small amount of power.

The device is capable of employment in other relations but is particularly useful in changing the direction of blocks of ice at right angles or anywhere where the ice has to be started from a condition of rest and speeded up to a normal working speed.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing in which—

Figure 1 is a plan of a machine constructed in accordance with this invention showing it in use for the purpose above described, and

Fig. 2 is a side view with parts in section.

Ordinarily in delivering blocks of ice which have been grooved so that they can be broken up into cakes of a predetermined size, large blocks, say two cakes in width and seven in length and weighing more than four tons or more fed up to a wall or other guide sidewise and then have to be started from a state of rest and fed along at right angles thereto lengthwise. This change in direction has always required the attendance of a large number of men.

In operating on cakes of ice, such as above mentioned, the number of men required at this point is often from twelve to sixteen, all of them working at a given time on a single one of these large strips of ice. The reason for this is obviously that this is a very large and heavy body to be started into motion from a state of rest while floating in the water, and that each block must be given sufficient pressure by each man with the help of the long pike with which they are provided to accelerate its speed gradually until it is moving at the desired rate. After that time two men can push it along, keeping its speed practically constant. Machinery has not been considered practical heretofore for starting the ice from a state of rest in a condition like this so far as I know, for the reason that the ice cannot be moved at any time at a rapid rate and must be accelerated gradually. Any known mechanical device for starting ice operates at a constant rate, and consequently will be likely to break its own connections or else not accomplish the desired object. I have provided an arrangement which can be controlled by one man and operated by a three-horse power motor that will accomplish this result in a satisfactory manner and eliminate most of the men required for getting such strips of ice started.

Referring to the drawings it will be seen that the ice is fed up by means not shown herein, but ordinarily by hand, to position A and into position B. From the arrows shown it will be seen that the block is fed up broadside against a wall or guide 10 and stopped there, the ice of course afloat in the water. This ice at this point has no headway and momentum must be gathered to get it to going in the direction of the arrow shown on the block of ice B. In order to accomplish this supports 11 are shown extending across the space in which the ice is located and supported in any desired way. Cross pieces 12 are carried by them and on these cross pieces there is a motor 13 which under the circumstances above described, may conveniently be a three-horse power motor. This drives a shaft 14 through a belt and pulley or the like which in turn by a positive drive, as for example, chain 15 and sprockets, drives a shaft 17. On this shaft there is shown a disk 18, but any other means for supporting a crank-pin 19 can be employed. This crank-pin is connected by a link 20 with an arm 21 on an oscillating shaft 22 which extends across the frame. This shaft has another arm 23 extending down to a position just above the ice. This is connected by a joint 24 with a rod 25 located substantially horizontally. This rod is provided with a spring 26 and has a bar 27 on the end. This bar is movably mounted with respect to a yoke 28 in which the spring

is mounted. This yoke 28 is connected to a solid body 29 which is controlled and operated by a handle 30. A spring 31 normally holds the body 29 up in the dotted line position shown in Fig. 2 so that spurs 33, 34 and 35 on its underside will not at such time engage the ice below. These spurs are of different lengths.

It will be obvious that under ordinary circumstances without any control by the operator the continuous operation of the motor 13 will result in the swinging back and forth of the arm 23 and the reciprocation of the body 29 in the air. When it is desired to start the block of ice into motion the operator, standing on the rear bar 11 or at any other convenient point, allows the body 29 to move across the ice almost to the end of its stroke and then pushes down with the handle 30 so as to set one or more of the teeth on the underside into the ice. They are not set into it very deeply at first because they are intended to scrape along it to some extent for the purpose of giving it some impetus and getting it started.

The object of the spring 26 will now be seen because it is obvious that if the operator sticks the prongs into the ice too deep any ordinary connections that would be provided would be likely to be broken unless there was something to yield, and the spring provides that safety feature.

Upon the completion of each return of the arm 23 the operator lets go of the handle 30 or at least allows it to rise and then on the forward stroke, using his judgment, he sets it down again until he gets it up to such speed that he can stick the prongs into the ice at the rear of the stroke and let it go at full speed for the whole length. At that time he knows that the ice is up to a certain predetermined speed, the machinery being designed to give that maximum. When he finds the ice is moving at that speed he no longer has to operate upon it.

After the ice leaves this machine at the desired speed it will feed along, if the ice plant is so designed, to the next station, but under ordinary circumstances, men are employed to engage the ice with their pikes and keep it going at a uniform speed for a considerable distance. It is to be understood, however, that these men are employed any way if a crew of from twelve to sixteen have to be used to start up the ice. This machine with one man controlling it does away with the entire crew ordinarily employed for giving the ice its initial momentum and delivering it to the next station or to the men to keep it going.

It will be seen therefore that by the use of this comparatively simple machine a material saving in labor cost is effected besides a saving in space, because ordinarily walks have had to be provided around the ice at this point to accommodate the large number of men working on it, whereas with this machine these walks can if desired be materially reduced in area.

It will be understood, of course, that according to the conditions of the work the ice moving body 29 and its connected parts can be duplicated or multiplied as desired without departing from the scope of this invention. They can be arranged to alternate with each other moving more slowly to get the same result.

Although I have illustrated and described only one form of the invention I am aware of the fact that modifications can be made therein without departing from its scope as expressed in the claims.

Therefore I do not wish to be limited to all the details of construction herein shown and described, but what I do claims is:—

1. In a machine for starting into motion a floating body of ice, the combination of a movable rod, a body, and a spring connection between said rod and body, said body having a plurality of spurs of different lengths thereon for engaging a block of ice below.

2. In an ice moving machine the combination of a body having a spur for engaging the ice, with power-operated means for moving said body back and forth, manually operated means for raising the body, and yielding means for normally holding the body up out of contact with the ice when no pressure is placed on the manually-operated means.

3. In an ice moving machine, the combination of a body having a spur for engaging the ice, with power-operated means for moving said body back and forth, manually operated means for raising and lowering the body to control its effect on the ice, and yielding means between the power and said body for permitting the power-operated connections to move forward faster than said body when the spur is first engaged in the ice.

4. In a machine of the character described, the combination of a crank, means for constantly rotating said crank, a lever connected therewith and adapted to be oscillated by the crank as it rotates, a rod connected with the lever, and a body yieldingly connected with said rod and having a spur thereon for engaging a block of ice below.

5. In a machine of the character described, the combination of a crank, means for constantly rotating said crank, a lever connected therewith and adapted to be oscillated by the crank as it rotates, a rod connected with the lever, and a body yieldingly connected with said rod and having a plurality of spurs of different lengths thereon for engaging a block of ice below.

6. In a machine of the character described, the combination of a crank, means for constantly rotating said crank, a lever connected therewith and adapted to be oscillated by the crank as it rotates, a rod connected with the lever, and a body yieldingly connected with said rod and having a spur thereon for engaging a block of ice below, said body having a yoke thereon into which said rod runs, and a spring interposed between the end of the rod and the end of the yoke which yieldingly connect them together.

7. In a machine of the character described, the combination of a crank, means for constantly rotating said crank, a lever connected therewith and adapted to be oscillated by the crank as it rotates, a rod connected with the lever, and a body yieldingly connected with said rod and having a spur thereon for engaging a block of ice below, said lever acting to support the forward end of said body, yielding means for normally holding the rear end of the body above the block of ice floating below.

8. In a machine of the character described, the combination of a crank, means for constantly rotating said crank, a lever connected therewith and adapted to be oscillated by the crank as it rotates, a rod connected with the lever, and a body yieldingly connected with said rod and having a spur thereon for engaging a block of ice below, said lever acting to support the forward end of said body, yielding means for normally holding the rear end of the body up above the block of ice floating below, and a handle pivotally connected to the rear end of the body by which it can be forced down to engage its spur into the ice.

9. In a machine of the character described, the combination of a movable body having a spur thereon for engaging a block of ice below, means to support the forward end of said body, yielding means for normally holding the rear end of the body up above the block of ice floating below, and a handle pivotally connected to the rear end of the body by which it can be forced down to engage its spur into the ice.

10. In an ice moving machine, the combination of a body having a spur for engaging the ice, with power-operated means for moving said body back and forth, and yielding means between the power and said body for permitting the power-operated connections to move forward faster than said body when the spur is first engaged in the ice.

In testimony whereof I have hereunto affixed my signature.

EDWARD W. FLETCHER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."