C. GARRISON.

ICE LOWERING MACHINE.

APPLICATION FILED NOV. 9, 1917.

1,277,567.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

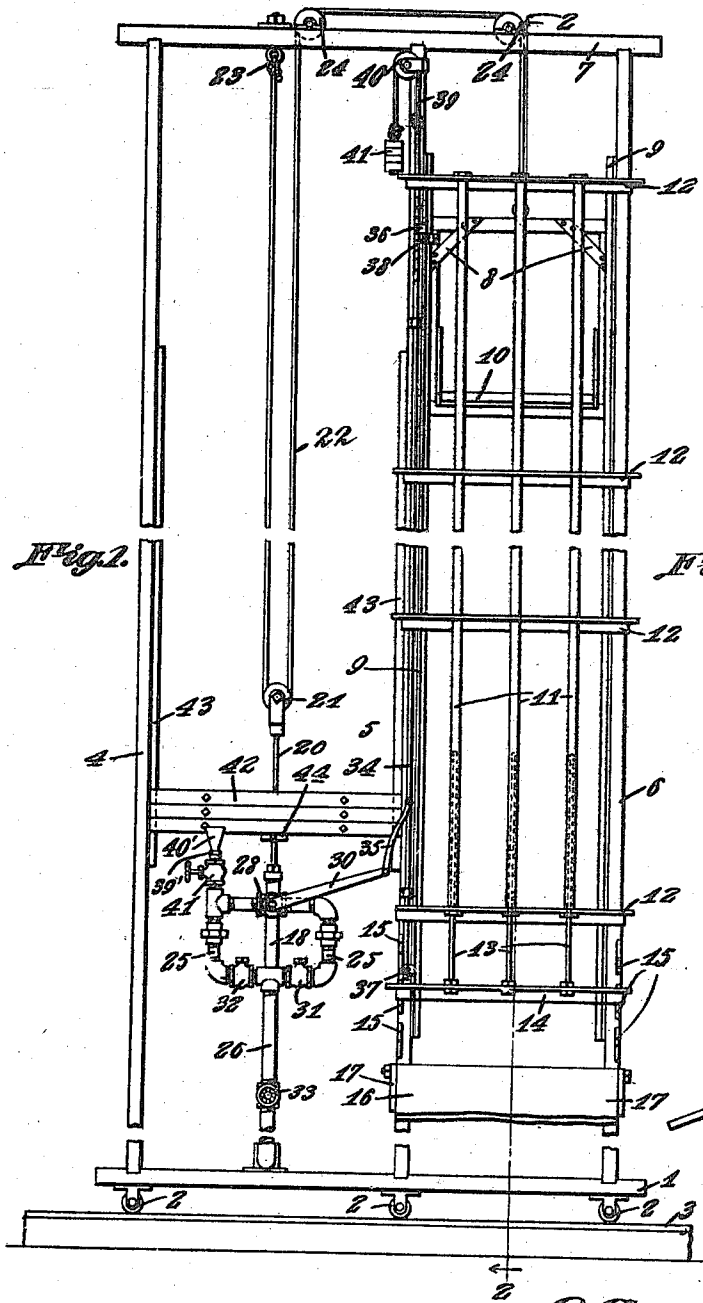


Fig. 1.

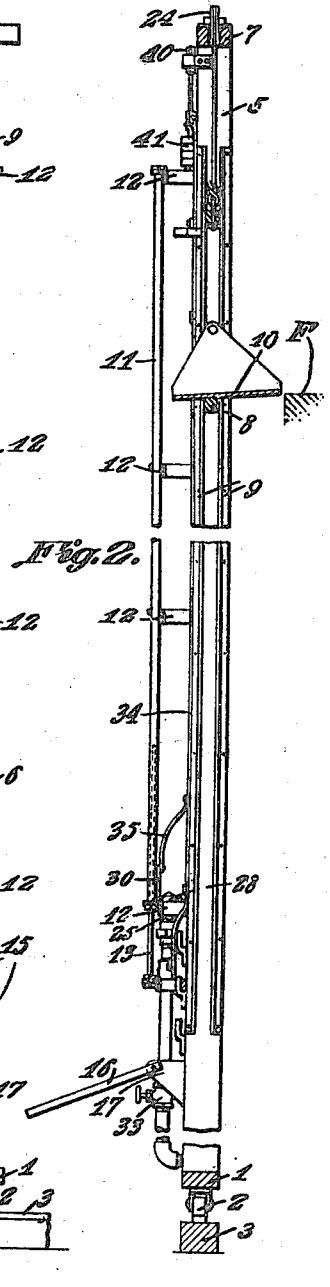


Fig. 2.

Witnesses

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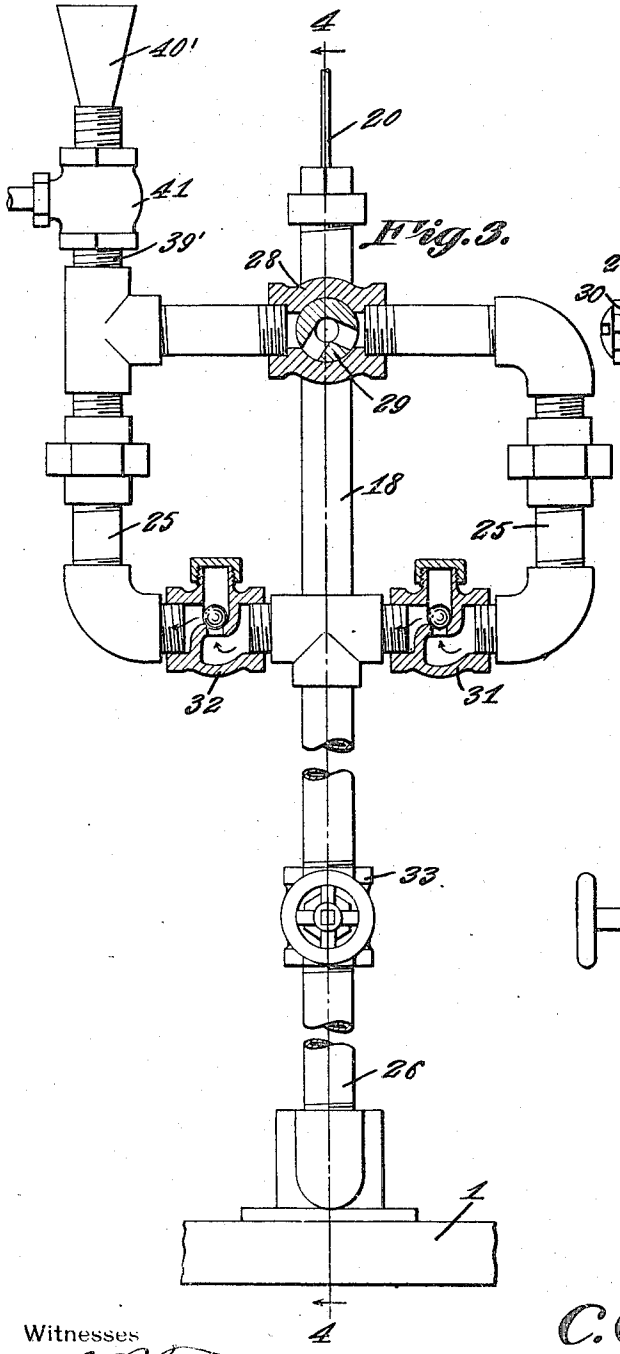


Fig. 3.

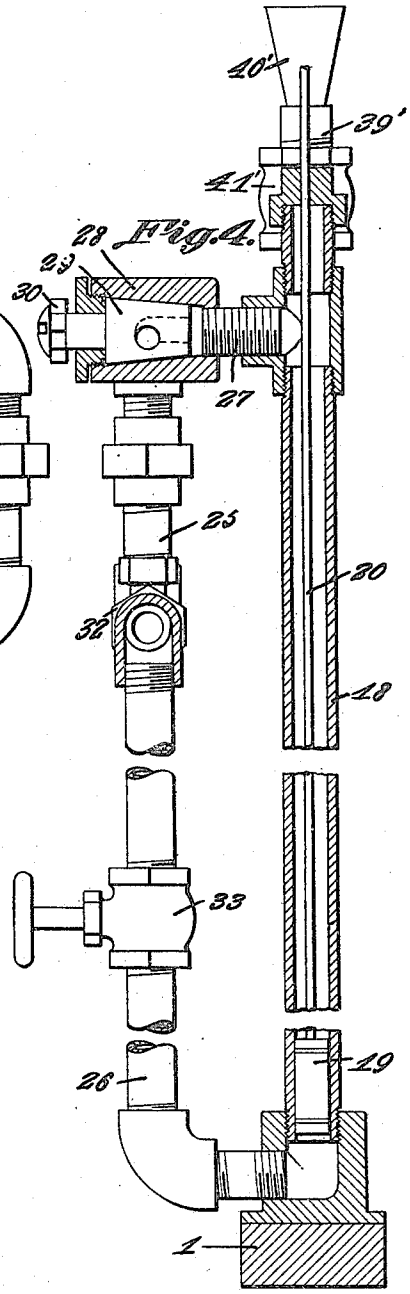


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES GARRISON, OF PORTOLA, CALIFORNIA.

ICE-LOWERING MACHINE.

1,277,567. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed November 9, 1917. Serial No. 201,101.

To all whom it may concern:

Be it known that I, CHARLES GARRISON, a citizen of the United States, residing at Portola, in the county of Plumas and State of California, have invented a new and useful Ice-Lowering Machine, of which the following is a specification.

The present invention appertains to a machine useful in ice houses, warehouses, and elsewhere, for the purpose of lowering blocks of ice or other objects, and it is the object of the invention to provide a novel and improved machine of that nature which will operate automatically for lowering the ice or other articles with facility and despatch in a thoroughly efficient and practical manner.

A further object of the invention is the provision in combination with a vertically movable gig or carrier, of novel means for controlling the upward and downward movements thereof, and to automatically stop the movement of the gig at its predetermined limits of travel both upward and downward, so that the gig will move downwardly when occupied by the ice or other object and will be stopped in its downward movement at a predetermined point of discharge where the ice passes from the gig, permitting the gig to be raised up to a predetermined receiving position, means being provided for retarding both the downward and upward movements of the gig to avoid the excessive velocity thereof and to check and stop the movement of the gig at the predetermined points desired.

The operation of the machine is automatic, it simply being necessary for the chunks of ice to be moved into the gig when it is in its uppermost receiving position, the weight of the ice in the gig causing it to gravitate, and the ice being discharged from the gig at the point at which the gig is stopped in its downward movement, and this emptying of the gig resulting in its return to receiving position. The gig in reaching its uppermost and lowermost limits of movement actuates the means which retard the movement of the gig to stop the gig and permits its movement in the opposite direction, thereby rendering the controlling means entirely automatic.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a front view of the machine, portions being broken away.

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged view of the fluid controlling means, portions being shown in section and others being broken away.

Fig. 4 is a section on the line 4—4 of Fig. 3, portions being shown in elevation.

In carrying out the invention, there is provided a suitable upright frame 1 of appropriate size, and rendered portable by being mounted on wheels 2 for travel on a suitable track or rail 3, permitting the machine to be moved from place to place in the ice house, warehouse, or the like. This frame 1 is provided with the uprights 4, 5 and 6 connected at their upper ends by a cross piece or beam 7. A gig or carrier 8 is slidable between the uprights 5 and 6, which are provided with suitable guides 9 for the gig, and this gig has an inclined floor or bottom 10 to support the block of ice or other object.

A vertical grating is carried by the frame 1 in front of the gig, and comprises vertical pipes 11 extending through and carried by arched forwardly projecting brackets 12 secured to the uprights 5 and 6 at vertically spaced points. The gig moves behind said grating and its bottom 10 slopes forwardly so that the ice tends to slide forwardly in the gig and is prevented from moving therefrom by the grating. The lower end of this grating has an extension comprising vertical rods 13 telescoped into the lower ends of the pipes 11 and having a sliding connection therewith, and the lower ends of the rods 13 are secured to an arched forwardly projecting bracket 14 which is adjustable vertically with said rods. This bracket 14 can be supported in various vertically adjusted positions by means of hooks 15 secured to the uprights 5 and 6, thereby enabling this lower extension of the grating to be adjusted upwardly and downwardly

to correspond with the position of a chute 16 for the discharge of ice from the gig. The upper end of the chute 16 is supported from the frame 1 by any suitable means 17 which can also be engaged with the hooks 15, to raise and lower the chute, as when filling an ice wagon. Thus, as the chute 16 is raised during the filling of the wagon, the grating extension can also be raised. The grating will prevent the ice from being discharged from the gig until the gig reaches its lowermost position adjacent to the chute 16, at which time, the ice can slide from the gig under the lower end or extension of the grating onto the chute 16.

In order to control the vertical movement of the gig, an upright cylinder 18 of suitable length, about one-half the height of the frame 1, is disposed between the uprights 4 and 5 and attached at its lower end to the lower portion of the frame 1. A piston or plunger 19 works within the cylinder 18 and a piston rod 20 extends upwardly therefrom through the upper end of the cylinder, and carries a sheave or pulley 21 at its upper end engaging the depending loop of a cable or flexible element 22. One end of said cable is anchored to the cross piece 7, as at 23, above the piston, and from said anchor the cable extends downwardly under the sheave 21 and upwardly over sheaves or pulleys 24 mounted on the cross piece. From said sheaves 24, the cable extends downwardly between the uprights 5 and 6 and is connected to the gig 8. The connection of the loop of the cable with the piston, reduces the speed ratio between the gig and piston, so that the piston only moves one-half the distance of the travel of the gig. The cylinder 18 and its connections are filled with air, liquid, or other suitable fluid, and the flow of fluid from one end of the cylinder to the other is controlled in both directions, and for this purpose twin pipes 25 are connected in parallel with the opposite ends of the cylinder. Thus, the adjacent lower ends of the pipes 25 are connected by a common pipe 26 with the lower end of the cylinder, and the adjacent upper ends of said pipes 25 are connected by a common nipple or pipe 27 with the upper end of the cylinder 18, a suitable three-way controlling valve 28 being interposed between the pipes 25 and 27, to alternate the flow through the pipes 25 as the piston is raised and lowered to its limit of travel. The valve member or plug 29 of the valve 28 is of any suitable construction, such as illustrated, for alternately connecting the pipes 25 with the upper end of the cylinder as said valve plug is oscillated. The valve plug has an operating lever or arm 30 connected thereto and projecting toward the path of movement of the gig. Check valves 31 and 32 of any suitable construction are interposed in the pipes 25, the check valve 31 preventing the upward flow of fluid in the respective pipe 25, and the valve 32 preventing the downward flow of fluid in the other pipe 25, so that the fluid can only flow downwardly in the righthand pipe 25, as seen in Fig. 3, and upwardly in the left hand pipe. A retarding valve 33 is interposed in the common pipe 26 of the pipes 25 and can be set manually to control the flow of fluid through said pipe, thereby restricting the flow as desired, by the will of the operator, and constraining the piston and gig to move at the predetermined velocity, to avoid the excessive speed thereof which would be objectionable.

The controlling valve 28 is operated by the movement of the gig, and for this purpose, a vertical reciprocatory bar 34 is carried by the upright 5, and is connected by a link 35 with the lever 30. This bar 34 carries lugs 36 and 37 near its upper and lower ends, and said lugs are adjustable vertically to different positions. The gig has a lug 38 movable between the lugs 36 and 37 to contact therewith when the gig reaches its limits of travel upwardly and downwardly, respectively. A cord or flexible element 39 connected to the upper end of the bar 34 passes over a sheave or pulley 40 carried by the frame 1 near its upper end, and has a suitable weight 41 attached to its free end, to counter balance the bar 34 so that it can slide freely in either direction. When the lug 38 strikes the lug 36 during the upward movement of the gig, the bar 34 is slid upwardly, raising the lever 30 and swinging the valve member or plug 29 to the position shown in Fig. 3, establishing communication between the righthand pipe 25 and the upper end of the cylinder. When the gig reaches its lowermost position, the lug 38 thereof strikes the lug 37 and slides the bar 34 downwardly, to swing the lever downwardly and reverse the valve plug 29 so that it cuts off the flow through the righthand pipe 25 and establishes the flow through the lefthand pipe 25.

One of the pipes 25 is provided with an upstanding filling neck 39′ having a funnel 40′ for pouring water or other liquid into the cylinder and pipes, and the neck 39′ has a valve 41′ for closing it. It is preferable to use a fluid which is compressible and expansible, so that a cushioning effect is had.

A suitable counter weight 42 is mounted on the piston rod 20, and is guided by vertical guides 43 secured to the uprights 4 and 5, said weight 42 being movable between said uprights, and being supported by a collar 44 on the piston rod. The weight 42 is sufficient to raise the gig 8 when it is empty, but the weight 42 is overcome by the ice or other contents of the gig, causing the gig to gravitate.

The operation of the machine is as follows:

When the gig is empty, it is in raised position with the weight 42 gravitated to move the piston 19 downwardly, and the lug 38 having struck the lug 36 and raised the bar 34 to swing the lever 30 and valve plug 29 to the position shown in Fig. 3. Now, when the chunk or block of ice is placed in the gig, being slid therein from the floor or landing F of the building, the weight of the contents of the gig will cause it to gravitate, pulling the cable 22 and, therefore, raising the piston rod 20. The bar 34 remains in raised position, and the piston 19 being raised forces the fluid out of the upper end of the cylinder to the lower end thereof by way of the pipe 27, valve 28, righthand pipe 25 and pipe 26, the check valve 31 permitting such flow, and the valve 33 restricting the flow, whereby the gravitation of the gig is retarded. The fluid can not flow through the lefthand pipe 25 during such downward movement of the gig, and when the gig reaches the predetermined point of discharge, the lug 38 thereof strikes the lug 37 and moves the bar 34 downwardly and this will swing the lever 30 to reverse the valve 28, to shut off the flow of fluid through the right hand pipe 25. Consequently, when the flow of fluid is thus cut off, this checks and stops the upward movement of the piston 19, to stop the gig with its bottom 10 below the lower end of the grating, so that the ice or other contents of the gig will slide forwardly therefrom onto the chute 16. When the valve 28 is reversed, as stated, the fluid can not flow downwardly through the lefthand pipe 25, due to the presence of the check valve 32, but said check valve permits the fluid to flow upwardly, while the check valve 31 prevents the upward flow of fluid. The downward flow of fluid from the upper to the lower end of the cylinder is, therefore, stopped when the valve 29 is reversed by the downward movement of the bar 34, and when the gig is emptied, the weight of its contents being taken off of the cable 22, causes the weight 42 to again pull the gig upwardly and depress the piston 19. The fluid is now forced from the lower end of the piston to the upper end thereof, by way of the pipe 26, lefthand pipe 25, valve 28, and pipe 27, the valve 33 restricting the flow to cause the gig to be elevated by a uniform retarded movement. The bar 34 remains in lowered position with the valve 28 closing the right hand pipe 25 and opening the lefthand pipe. When the gig is returned to its raised position, the lug 38 thereof strikes the lug 36 and raises the bar 34 to return the valve 29 to the position shown in Fig. 3, thereby cutting off the flow through the lefthand pipe 25 which will stop the downward movement of the piston under the influence of the weight 42. The gig is then in position to receive the next load, so as to repeat the operation. The lugs 36 and 37 of the bar 34 can be adjusted vertically to different positions, whereby to stop the gig at the desired points, and the lower extension of the grating, chute 16 and lower lug 37 can be adjusted up and down to suit the conditions, as when filling an ice wagon.

Having thus described the invention, what is claimed as new is:

1. A machine of the character described embodying a carrier movable back and forth, a retarding mechanism connected to the carrier and having means to permit movement of the carrier in one direction only, and means to permit movement of the carrier in the other direction only, said mechanism having controlling means for alternately rendering said means inactive, and means operated by the carrier when it reaches its limit of movement in both directions for operating the controlling means to stop the carrier and permit movement thereof in the opposite direction.

2. A machine of the character described embodying a carrier movable back and forth, a retarding fluid-controlled mechanism connected to the carrier and having means for the flow of fluid in one direction only for the corresponding movement of the carrier and means for the flow of fluid in the opposite direction only to permit corresponding movement of the carrier, and means for alternately rendering said means inoperative to stop the carrier at its limit of travel in opposite directions and permit movement in the opposite direction.

3. A machine of the character described embodying a carrier movable back and forth, a retarding fluid-controlled mechanism connected to the carrier and having means for the flow of fluid in one direction only for the corresponding movement of the carrier and means for the flow of fluid in the opposite direction only to permit corresponding movement of the carrier, said mechanism having controlling means for alternately rendering said means inactive, and means operated by the carrier when it reaches its limit of movement in opposite directions for operating said controlling means to stop the carrier and permit movement in the opposite direction.

4. A machine of the character described embodying a carrier movable back and forth, a fluid cylinder, a piston movable therein and connected to the carrier to retard its movement, separate connections between the ends of the cylinder and each including a check valve, one to prevent flow in one direction and the other to prevent

flow in the opposite direction, and a controlling valve for alternately shutting off the flow through said connections.

5. A machine according to claim 4, and also including means for retarding the flow in both directions to retard the movement of the carrier.

6. A machine according to claim 4, and including means operated by the carrier at its limits of travel in opposite directions for operating said controlling means to stop the carrier and permit movement in the opposite direction.

7. A machine of the character described comprising a carrier movable back and forth, a fluid cylinder, a piston working therein and connected to the carrier to retard movement thereof, a pair of pipes communicating with opposite ends of the cylinder each having a check valve, one to prevent flow in one direction and the other to prevent flow in the opposite direction, controlling means for alternately shutting off flow through said pipes, and means operating the controlling means and operated by the carrier when it reaches its limits of travel in opposite directions.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES GARRISON.

Witnesses:
RAY POWELL,
JOHN S. SORRACCO.

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