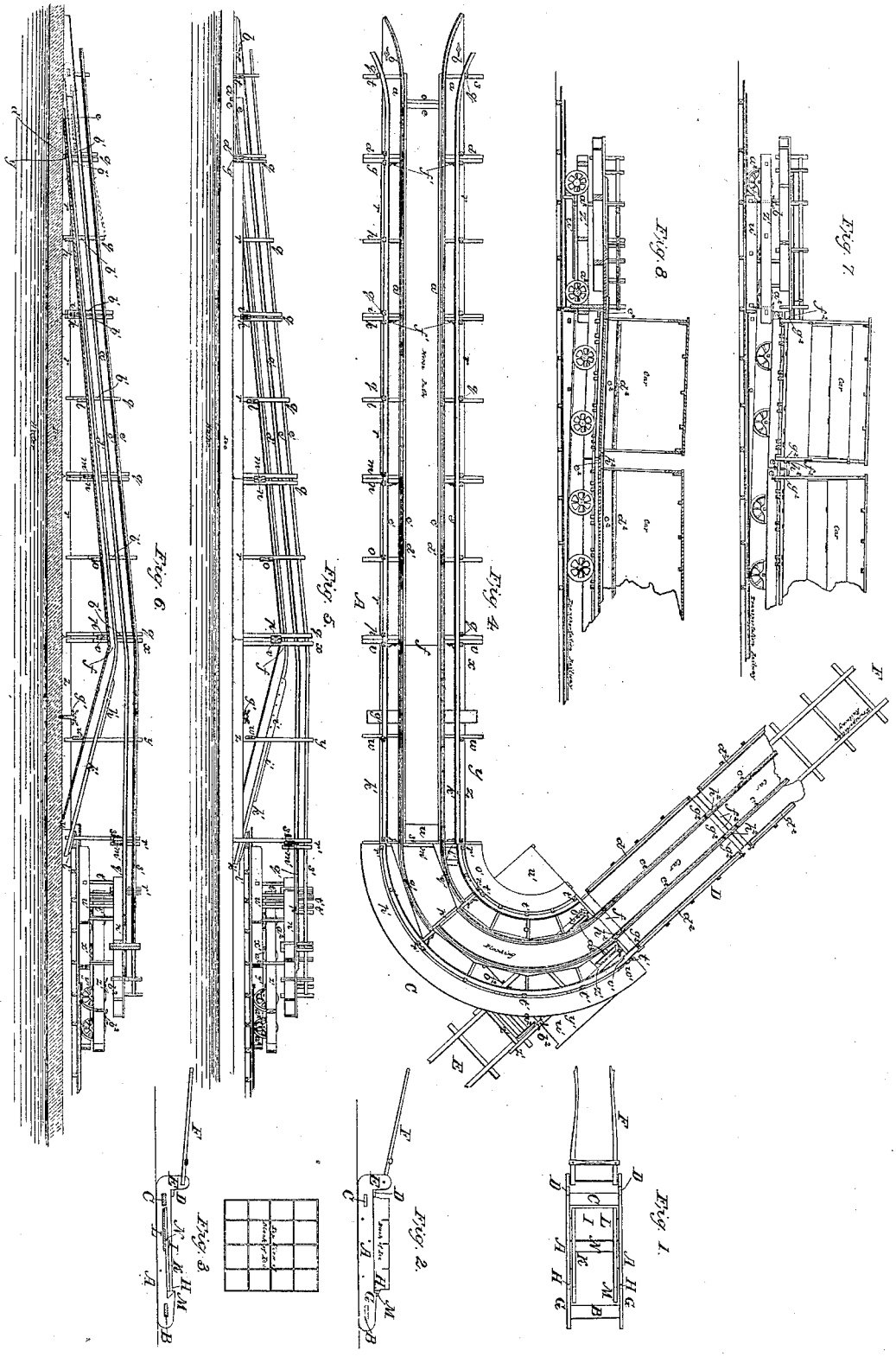
N. J. WYETH.

MACHINE FOR RAISING ICE.

No. 2,381. Patented Dec. 10, 1841.



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UNITED STATES PATENT OFFICE.

N. J. WYETH, OF CAMBRIDGE, MASSACHUSETTS.

MACHINERY AND CAR FOR ELEVATING AND DEPOSITING BLOCKS OF ICE IN CARS FOR TRANSPORTATION.

Specification of Letters Patent No. 2,381, dated December 10, 1841.

To all whom it may concern:

Be it known that I, NATHANIEL J. WYETH, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Machinery for Raising Blocks of Ice from the Lake when Frozen or Formed and Depositing the Same on Railways and in Railway-Cars, of which the following is a full and exact description, reference being therein had to the accompanying drawings, which, combined herewith, form my specification, and in the same I have set forth the nature of my invention, by which it may be distinguished from others of a like character, together with such parts or combinations of the same as I claim and for which I solicit Letters Patent.

Figure 1 of the above mentioned drawings represents a ground plan or top view of the sled which I use in connection with the other machinery to be hereinafter described. Fig. 2, is a side elevation and Fig. 3 is a longitudinal vertical and central section of the same.

A, A, in the drawings are two runners, which, when the sled is used in connection with my apparatus, which "raises" the blocks of ice from the water and deposits them on a sled on which they are removed to the storing houses or elsewhere," or, that by which "blocks of ice are raised and deposited on railways and in railway cars," are to be somewhat less in height than the "sled guides" of the "receiving railway" of the former, or the slide rails of the inclined plane of the latter; and should be placed at a width apart suitable to pass between them. The length of these runners may be about three feet greater than the general size of the blocks of ice to be laden on the sled. These runners are secured in position by two strong cross bars B, C, placed midway between the upper and lower edges of the runners and as near the ends of them as possible, consistent with a due degree of strength to the mortises in the runners into which the extremities of the bars are tenoned. The runners have two head pieces E, E, applied to their forward ends, and projecting above them as seen in the figures, and suitably secured thereto in the usual manner. The rear edges or shoulder parts D, D, of these head pieces, serve to prevent the block of ice from sliding too far forward on the sled, when received thereon. The shafts F are connected to these head pieces in the usual manner. In rear of the shoulders D, of each of the head pieces of each runner, and at a distance equal to the length of the block of ice to be deposited on the sled, there should be another shoulder G, raised above the top of the runner about one inch as seen in Figs. 1, 2. The runners should be rounded up on their front and rear ends, and may be plated with iron on those parts subject to wear. A steel or metallic point H should be inserted in the top of each runner a few inches front of the shoulder G; which point should project from the top edge of the runner about three quarters of an inch, its object being to prevent the block of ice from sliding laterally.

I, Figs. 1 and 3, is what I term the "catch." It is constructed of two pieces of timber K, K, one of each being placed very nearly in contact and parallel with the inside of each of the runners. They are long enough to reach from near the rear edge of the front bar C to near the front edge of the rear bar B. These two pieces should be connected together, at their front ends, by a wide transverse plank L, Figs. 1 and 3, and their rear ends should have shoulder pieces M, M, projecting above them, square on their front and inclined backwards in rear of the shoulders as seen in the drawings. The front edges of the shoulder pieces M, should be in a line drawn between the shoulders G, G. The catch, being thus arranged, is attached to the runners by a long bolt N, Figs. 1, 3, passing through it and the runners, and so situated, as to cause the weight of the front end of the catch to be superior to that of the rear end, and thus to raise said rear end into the position seen in the drawings, or to cause it to return to this position whenever any force, which depresses the shoulder ends of the catch, is removed therefrom. The purpose of the catch is to prevent the load from sliding off backward, while ascending the inclined plane, which latter will be hereinafter described.

The next portion of the machinery to be described is the inclined plane, whose purpose is to elevate the blocks of ice to such a height, above their position when laden on the sled, as they are required to be when

placed upon the railroad cars for transportation, and at the same time to unload them from the sleds, leaving them on the railway from whence they are slid into the cars. Fig. 4, is a top view of the inclined plane, exhibiting its connection with the railway and cars thereon. Fig. 5, is a side elevation of the same taken on the side A in Fig. 4. Fig. 6, is a vertical and central section of the inclined plane on a line from B to C of Fig. 4. Fig. 7, is a side elevation of the machinery taken on the side D of the railway as represented in Fig. 4. Fig. 8, is a vertical and central section taken on the line from E to F Fig. 4. For the sake of convenience and distinction, I shall term that end of the machinery on which the letter B is marked in Fig. 4, the front end, the other end being the rear end, and I shall in speaking of the different parts designate them by the terms front or rear according to their proximity to the ends or to their facing one or the other of the same.

a, *a*, Figs. 4, 5, are two broad planks laid flatwise on the ice having their rear ends from nearest edge to edge, as far apart as the clear width of the sled from outside to outside, and their front ends narrowing, and opening outwards, so as to present a wide entrance for the sled, the space between them narrowing toward the rear so as to bring the sled upon the proper track on which the runners are to slide. These planks are secured to the surface of the ice of the lake by screws *b*, *b*, working into holes previously bored in the ice. The planks *a*, *a*, are secured in position by a crop piece of timber *c*, Fig. 4, bolted to their under sides. The upper surface of the transverse timber *c* should be even with the surface of the ice of the lake.

A plank *d*, Figs. 4, 5, is arranged transversely with its edge up and is connected with the planks *a*, *a* serving to keep their ends in their places.

e f is an inclined plane or horse track which commences just in rear of the timber *c*, and extends, in a regular inclination to the horizon, as far as the point *f*. It is composed of broad planks supported on transverse bearers *d*, *g*, *h*, *i*, *k*, *l*, *m*, *n*, *o*, *p* which are bolted or otherwise properly secured to upright posts *q*, *q*, *q*, *q*, *q*, &c., Figs. 4, 5, raised on each side of the horse track. and whose lower ends are suitably attached to long longitudinal planks *r*, *r*, *r*, *r*, *r*, *r*, the two front posts being secured to the front sides of cross planks *s*, *t*, which are placed edge upward, each resting partly on the ice and partly on one of the planks *a*, *a*, as seen in Figs. 4, 5. From the point *f* the inclined plane or horse track descends rearward toward the surface of the ice or to a point *u*, as seen in Figs. 4, 6. This latter portion of the inclined plane is also supported on cross bearers *v*, *w*, bolted to the sides of the perpendicular posts *x*, *x*, *y*, *y*, the said posts being arranged and connected to planks *z*, *z*, similar to the posts *q*, *q* before described.

a', *a'* are the slide rails, each placed equidistant from the center of the horse track and extending parallel therewith. They commence upon the front ends of the opposite interior curved edges of the planks *a*, *a*, and partake of the curve or flare of the same for a short distance, and at their front ends they are raised about four inches above the surface of the ice. These rails are raised above the plane of the horse track and are suitably supported at intervals or posts *b'*, *b'*, *b'*, *b'*, &c., bolted to the sides of the transverse planks *g*, *h*, *i*, *k*, &c. The upper edge of these slide rails should be plated with a smooth bar of iron *c'*, *c'*, on which the block of ice slides, as will be hereafter more particularly explained. Their front ends should, (and will) be depressed for a short distance lower than the height of the runners of the sled, (the sled being represented at the foot of the plane in the section Fig. 6, by red lines), and for the remainder of the length of each of the slide rails, each should be parallel with the sled tracks, (which will be hereinafter described), and elevated above them at a distance a little greater than the height of the sled runners. The sled tracks consist of two pieces of timber *d'*, *d'*, Figs. 4, 5, 6, placed parallel with each other and with the plane of their upper edges parallel with the plane of the slide rails. They are bolted to the inner sides of the posts which support the slide rails. At their front ends they are level or even with the surface of the ice of the lake, and generally speaking they are in width about equal to that of the sled runners. They serve for the runners to rest on while the horse draws the sled up the inclined plane and the distance of the slide rails apart should be a trifle greater than the clear width of the sled.

Guide rails *e'*, *e'*, are arranged on each side of the center of the horse track and equidistant and at a distance therefrom a little greater than half the width of the block of ice to be raised on the sled. They should be situated in a plane somewhat above and parallel with that of the tops of the slide-rails, and at their front ends they should open or flare outward in a manner corresponding with the slide rails, their front ends at the same time not extending so far forward as the slide rails as seen in Figs. 4, 5, 6. The object of the termination of the guide rails, at a distance shorter than the slide rails is to cause the block of ice to take a centrol position on the sled, should it by any means have been previously moved laterally thereon, for when the runners pass

between the slide rails and come into their central position, the block of ice coming in contact with the curve of the guide rails will be pressed back so as to take its requisite position on the sled, to pass between the parallel parts of the guide rails. Their inner and vertical faces should be plated with a smooth bar of iron in order to prevent wear and to facilitate the movements of the ice.

All that part of the inclined plane in rear of the top of the ascent or point *f* I denominate the first section. It may be divided in any suitable manner into separate sections for the convenience of transportation to different points, and when put together these sections may be confined by screws and nuts as seen at *f'*, *f'*, *f'*, *f'*, &c., Fig. 4, or in any other convenient manner. The drawings are intended to represent this part of the inclined plane so constructed, which is similar to the method heretofore adopted in my ice machinery.

I now proceed to describe the remainder of the descending part of the inclined plane, or that portion extending from *f* to *u*, Fig. 4, which I denominate the second section. It is constructed so far as regards its guide and slide rails, posts and horse track and sled tracks, in a similar manner to the first section heretofore described, excepting that the slide and guide rails are horizontal and the sled and horse tracks are inclined downward at such an angle as to reach the surface of the ice in the length of this section. The portions of this section which are otherwise different from the first section are as follows: *g'* is a plank placed horizontal and transversely on the tops of the runners *z*, *z*, which rest on the ice, and well secured thereto. *h'* Fig. 6, and *i'*, Fig. 5, are two guide pieces bolted on the outer sides of the timbers forming the sled tracks of this section, and extending above the plane of the upper edges of the same, their object being to keep the sled in place as it descends below the slide rails. It will be observed that the piece *i'* is double the length of the piece *h'*.

k', *k'*, are two planks each being about sixteen inches wide, arranged on the outer side of each sled track rail with its side upward. They extend from the middle post to a short distance beyond the rear post of this section, until they reach the level or about the level of the ice or ground under the section.

l' Figs. 4, 6, is a block placed on the lower part of the upper surface of one of the side planks as represented in the drawings and having its outer edge in contact with the side of the post contiguous to it. Its front edge is suitably curved or shaped. This block serves as a fender to protect the above post, and also to prevent the sled as it leaves the inclined plane from wedging against the said post.

From the above it will be seen, that when the sled with the block of ice thereon is drawn up the front portion of the inclined plane, the block is raised a little from the runners of the sled and received and supported on the slide rails independent of the runner and held in position over the sled and prevented from sliding back by the shoulders M, M, of the catch of the same. On reaching the top of the ascent of the plane, the block of ice is deposited on the horizontal slide rails of the second section, when the horse descends with the sled the shoulders of the catch gradually falling away from the side of the block until it is received on the horizontal rails, and permitting the sled to pass down the descending plane. The horizontal rails may be extended into storehouses or depots for loading ice into cars or for other purposes, the blocks of ice being moved upon the rails into the same. The exterior of the slide rails beyond the second section is represented in Fig. 4, by a curve which terminates, as will be hereinafter more particularly described, upon the transportation railway or in a plane raised to a height above the transportation railway corresponding with the level of the flooring of the cars into which the blocks of ice are to be loaded. If a car is moved on the railway so that its open end may abut against the termination of the slide rails the blocks of ice may be pushed from the rails into the car as will be hereinafter more particularly explained. The curve of the slide rails above mentioned is not necessary for the inclined plane with the horizontal rails of the second section may be arranged at one extremity of the transportation railway, provided the horizontal slide rails, are of sufficient length to permit the horse to descend the inclined plane, and have room enough to pass in a lateral direction away from the same.

I shall now proceed to describe the construction of the succeeding, or that which I shall term the "Third Section" of the apparatus. In order to facilitate the transportation of ice, the railroad leading from the lake where the ice is produced, is carried in whole or in part along the shore or margin of the same, and as it becomes necessary to elevate the blocks of ice into the cars with as much despatch as possible—the inclined plane by which they are raised should be situated as near the spot from which the ice is to be taken, as circumstances will permit. Therefore it becomes necessary to devise some method by which it may be connected with the railroad at any point or part of the same. The next portion of the machinery will exhibit this connection, which is accomplished by the intervention of a se-

ries of curved rails mounted on a carriage on which they may be moved upon the railroad to any desirable part thereof.

m', n', Figs. 4, 5, are two beams or bearers each radiating toward the center of the curve of the slide rails, and extending beyond the slide rails a sufficient distance on each side of the center thereof—to serve as a support for stepping planks o', p', on which the men walk, who impart a progressive motion to the blocks of ice. These bearers should be arranged edge upward. They serve to sustain the timber q', q', forming the slide rails together with the posts r', r', to which the guide rails s', s', are bolted. The plank m' is placed in opposition with, and connected by screw bolts and nuts, to the last rail plank s^3 of the second section heretofore described. The guide rails should be a little farther apart than those of the second section in order to permit the square blocks of ice to freely pass between them—and their distance from each other must be regulated according to the sizes of the blocks of ice. The portion of the third section just described is separate from the remainder, it being secured thereto by screw bolts passing through the rear bearer n'—the object of the same being to enable the apparatus to be adjusted to the inclined plane, whenever it may be requisite to change it to the opposite side of the railroad. The succeeding portion of the "third section" is a continuation of the curve which is here represented in whole as being about one hundred and thirty degrees—the first portion of the curve heretofore described, making about forty degrees of the same. The whole is constructed with slide and guide rails, platform and bearing beams, similar to those heretofore described secured to posts t', t', t', whose lower ends are inserted and suitably secured in the upper surface of a strong platform u' placed and resting upon the iron rails of the transportation railway and secured in its position in any convenient manner. Its slide rails are placed nearer together than those of the first and second sections, and the space between them, if necessary may be planked over as seen in the drawings to be used as a slide way for small blocks of ice such as are stored for summer shipment. To facilitate the movements of the ice, the several rails with which it comes in contact should be plated with smooth bars of iron. On or near the end of that guide rail, which is at the greatest distance from the center of the curves a piece of wood or iron v' should be attached by a hand screw w' or any other convenient manner. The said piece v' being curved like the guide rail—and extending beyond the extremity of the same a short distance so as to reach into the body of the adjacent car and form a connection with its guide rail the object of the same being to prevent the block of ice from catching against the edge of the side of the car and to facilitate its movement into the same.

For convenience of transportation the platform u' may be made in two parts x', y', connected together by hinges so that the portion of the same projecting beyond the side of the railway may be turned up or over upon the other which rests directly on the rails, when the apparatus is moved from place to place. It may also have a carriage frame Z' Figs. 4, 7, 8, arranged over it, having railway wheels a^2, a^2 resting upon the railway, the front portion of the platform being suitably cut so as to admit the front pair of wheels to pass through the same as seen in the drawings. The carriage frame should extend over the railway some distance back of the platform so as to enable the rear pair of wheels to operate in rear of the end of the platform. The platform should be connected to the carriage frame by four or more long screws h^2, h^2, h^2, h^2, h^2, which pass through suitable cylindrical holes bored vertically through the sides of the carriage frame and are screwed into the platform. On turning these screws in the proper direction, the platform may be raised from the railway track and suspended to the carriage by which it may be moved from place to place on the railway.

The cars receive the blocks of ice from the slide rails of the inclined plane and sections succeeding it, for which purpose the train of cars is placed so that one end of it may be in contact with the rear end of the loading apparatus as seen in Figs. 4, 7, 8. The cars should have slide rails c^2, c^2, affixed to their bottoms and guide rails d^2, d^2, arranged on their sides, the same being a continuation of the slide and guide rails herein before mentioned. Two blocks of ice such as are laden on a sled should cover the bottom of a car, but the cars may be constructed large enough to receive more if necessary, but whatever number of pieces are to be placed on each other in the cars, the same must be arranged or loaded on the sled previous to being elevated into the cars, when they are handled as one piece. The first pile or sled load of ice is slid throughout the train of cars upon the slide rails of the same in the rear part of the car farthest from the inclined plane. The next sled load is passed through the train in a similar manner, until it abuts against the first, and so on with the rest until the cars are laden. The carriage frames of the cars should project beyond the ends of the bodies, in order to form bumpers e^2, e^2, in the usual manner, and the ends f^2, f^2, of each car should be attached to the bottom by hinges g^2, g^2, so as to be turned down upon the projecting parts of the carriage frame and thus fill the spaces of and

between the bottoms of each car. A small slide rail h^2 should be bolted to the upper surface of each of the ends of the car, the one on one end being on the opposite side of the car to that of the other as seen in the drawings and each being so long as to lap over upon the hinged end of the next car, so as to complete the connection of the slide rails. The above method of connecting the cars also admits the load to be slid throughout the train and discharged from one end of it.

Having now completed the description of my improvements I shall claim—

1. Elevating blocks of ice from a lower to a higher level by means of the sled in combination with the ascending and descending inclined planes and horizontal rails extending over the descending plane and which horizontal rails, receive the blocks of ice, when the sled passes down the rear plane, the whole being constructed arranged and operating substantially as herein above set forth.

2. Also. That arrangement of machinery or addition to the sled, which is herein termed the catch for the purpose of retaining the blocks of ice over the sled and preventing them from sliding down the inclined plane, when they are received upon the slide rails of the planes, the same being constructed substantially as herein before explained.

3. Also. The method of connecting the inclined and descending planes and horizontal rails with the transportation railway, at any desirable station of the latter by the arrangement of curved slide and guide rails supported on a platform having railway wheels connected to it, by which it may be transported from place to place as occasion may require, the whole being constructed and arranged on principles and in manner substantially as described.

4. Also. Constructing the railway cars in the manner above set forth, with slide rails arranged on their bottoms and guide rails on their sides and connecting those of each car by the hinged ends, each having a small lapping rail upon it, which extends over that in contiguity with it, and by means of which any two cars may be united, whatever ends of the same are brought together, the whole being for the purpose of sliding the blocks throughout the train, and loading the same thereon and unloading the same therefrom as hereinbefore described.

5. Also. Curving the guide rails and commencing them in rear of the slide rails, as described, for the purpose of causing the ice to resume its proper position on the sled, to pass up the inclined plane, should the ice, by any accident, have been forced over the side of one of the runners more than that of the other.

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this twenty sixth day of October in the year eighteen hundred and forty one.

NATHL. J. WYETH.

Witnesses:
R. H. EDDY,
EZRA LINCOLN, Jr.