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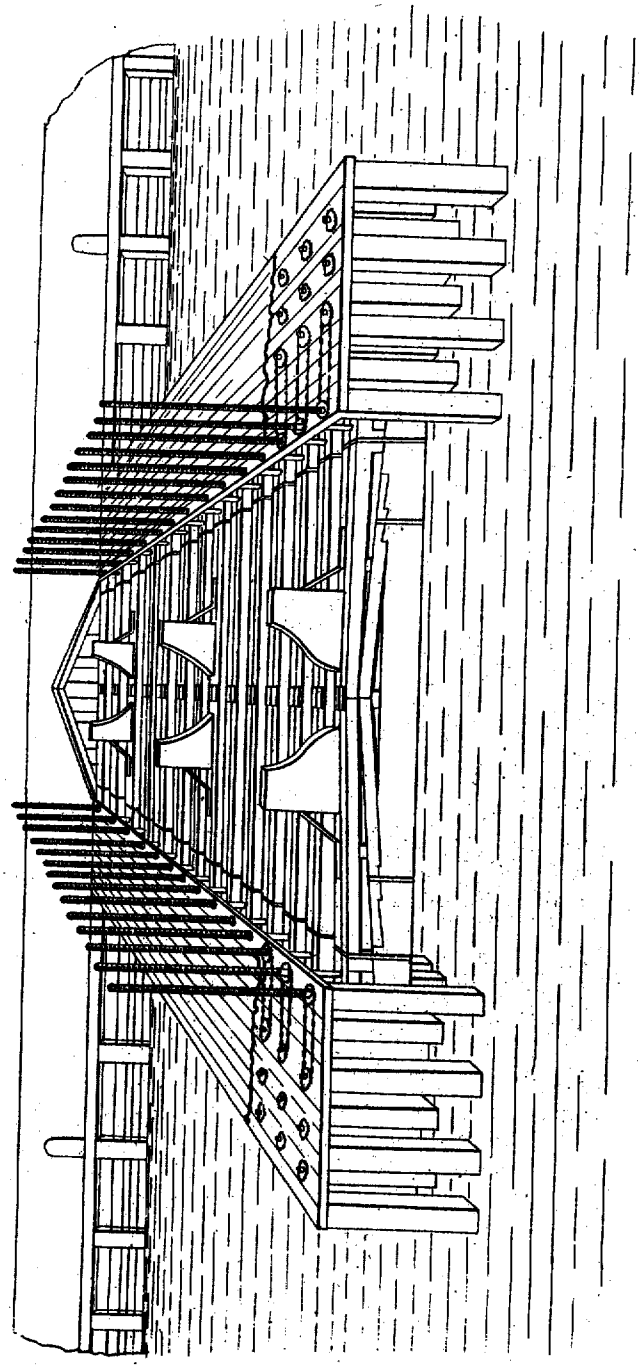
OR X 5,351

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J. T. Ely.

Dock,

Patented Jan. 28, 1829.



Jan 28. 1829

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John C. Ely.

Letters Patent.

The Schedule referred to in these Letters Patent and making part of the same, containing a description in the words of the said John C. Ely himself, of his improvement in Screw Docks.

Having selected a place for the dock where the water is of sufficient depth, if the shore is not sufficiently bold to form the head of the dock, build a wharf for this purpose, and from this wharf build two piers running, one alongside of the other one hundred and twenty feet into the water, or far enough to inclose the machinery of the dock proposed to be built; these piers should be sixty three feet apart, and may be filled up solid or be built on piles as may be most convenient; and they should each be about eighteen or twenty feet in width at the top, and should be covered with plank or some other good flooring. To provide for receiving the dock frame and for raising the vessel, when in the dock, place two heavy pieces of timber or plates each twenty by twenty four inches square against the inner upright edge of each pier, so as that the upper surface of the plate may be even with the surface of the piers, and so that the plates may project their width inwards. These plates must be well secured in their places by posts or eight inch piles placed under them against the inner side of the piers. These posts must be very large and placed within a short distance of each other, and these piles must sustain the whole weight of the machinery of the dock, and vessel when raised. There should be at least [illegible]

raised her keel rests on these sections and suspended in their centre at right angles. Each section is composed of four pieces of strong firm timber thirty five feet long, and should be eighteen inches square. The two upper pieces are placed directly over and about two feet above the two under piers, and parallel to each other leaving a space between the timbers sufficiently wide to admit the screw. The upper and lower timbers are fastened together by posts at the end, and braced from the ends to the centre in such a manner as to sustain the greatest possible weight. The object of forming these sections in this manner with two timbers one over the other, is to enable the workmen to secure them by the common method of bracing and bolting, in such a manner as to sustain the weight of the heaviest ships without yielding or springing. These sections are suspended in the dock from the plates above described on thirty two screws passing through said plates down through the ends of each section in such a manner that the sections will lie parallel to and at equal distances from each other, and at right angles with the plates or sides of the dock. The screws may be secured in the ends of the sections by keys passing through them or by a female screw nut or casting of sufficient size to sustain the sections. Whenever it is intended to use the dock for taking in steamboats the screws should be secured in the ends of the sections by a female screw nut or casting so as to let the screw pass through far enough to admit a steamboat into the dock, without the guards of the boat elevated above the plates of the dock; this is done by passing the screw so far through the female screws in the sections as to prevent the lower ends of the screws from coming in contact with the guard of the boat when raising it. These screws may be of wood, iron, or brass. Wooden screws will do very well for small docks, but iron or brass are better for large docks. For a dock of sufficient size and strength to raise a ship of five hundred tons, which is the one proposed

It would be inexpedient to put wooden screws into a dock of this size; they should be used in small docks only, and that when they would be cheaper than iron or brass; and when used their size must be fixed by the judgment of the workman from his knowledge of the timber of which they are to be made and the weight to be raised. Circular plates or castings twenty four inches in diameter and two inches thick are put upon the beams or plates through which the screws pass; upon these plates, round the holes in the centre through which the screws pass and within about one inch of the screws is cast a circular groove to admit the friction balls or rollers used in turning up the screws. The nut or female screw, by which the male screw is turned up should cover about eighteen inches of the male screw, so that it will be in no danger of stripping; the body of the nut or female screw should be from ten to twelve inches in diameter and may be circular or eight square with a projection of five inches at the bottom like the brim of a hat with the crown uppermost; which projection should be two inches thick. Friction balls or rollers are placed in the grooves of the plates under the nuts or female screws so as to take off the friction as much as possible when the screws are raised up. Flooring should be put over each section separately, so that each may be raised or lowered by itself; and when so that when two or more sections are placed on a level they will form a convenient platform for the workmen upon the vessel. When the vessel is in the dock ready to be raised it must be secured by proper shores, blocks or bilge wedges. To enable one man to turn up each screw in the easiest and most convenient manner place a ratch wheel, two feet in diameter and two inches thick, over the above described nut or female screw, so that it will set snug and secure it by a pin to the projection, another similar wheel is placed opposite each screw upon a shaft secured in the centre of the pier. These wheels are connected by a chain with equal links passing round them and corresponding with the teeth on the ratch wheels; and thus the process is [illegible] in the centre of the pier is made to bear upon the

the lever is applied and can keep the screw constantly in motion upon the shaft upon which the wrought-wheel is placed, in the centre of the piece place a common spur wheel, three feet in diameter and two inches thick; let this wheel mesh or gear into another similar wheel of half the size, placed upon another shaft, and let this wheel gear or mesh into another similar wheel and half the size of the last wheel, placed upon another shaft. each of these wheels must be so formed that a lever can be applied to turn them, and the labourer when he finds the first wheel turns too hard applies his lever to the second and so to the third as the weight increases, until the ship is up. Each wheel increases the power but decreases the speed with which he raises the screw-when the vessel is properly secured upon the cheeliers the men are placed at the screws and each screw is manned as to that each section may sustain its due proportion of the ships weight while raising. To enable the workmen to raise a very heavy ship with more ease, and when it may be thought necessary to relieve the screws in some degree, attach a weight to each end of each section by a chain passing over a pulley or wheel, secured to the plates above with hooks and catches to secure the weight to the chain and to secure the chain in any position desired, and so fixed that the weight may be easily applied to the section or taken off at pleasure. Each weight may be from five fifteen tons, more or less, as may be thought expedient; and as it may be thought advisable in the manner to relieve the workmen and ease the screws. These weights serve also to regulate the pressure on the screws and render it more equable. They may, however, be provided or not, at the pleasure of the builder or owner of the dock. They do not make a necessary part of the machinery any more than the above described ring for more easily turning up the screws; as it is obvious that that the screws may be turned up by any power which the operator chooses to apply

dock nor any one of the several minor improvements which I have made in it and which I believe to be my inventions, But I do claim as my invention the above described method of applying the screws whereby the sections are suspended upon the screws and are not forced up by the screws having a fast nut or bearing under water upon which the sections are supported by the above method of applying the screw-in connection with the screw and by having the screws, the part of the screw-rods passing through the sections made so that they may be easily disconnected. I also claim as my improvement the application of weights to the raising of the sections of the screw-dock as above described acting in combination with the screws. I further claim as my improvement the above described method of constructing and preparing the sections by forming the mud-sills through the female screws placed at the ends of the sections whereby the steamboat with her guard and other machinery in may be taken into a dock of a width sufficient to receive her hull. I further claim as my improvement the above combination of the screws with the gearing so as to enable a man by one continued motion of a crank to revolve the whole of the screws at once, and through the medium of the gearing to raise the sections. In witness whereof I have hereunto set my hand and seal this twenty-fifth day of December eighteen hundred and seventy-eight.

Witnesses

Geo. C. Goddard

Stephen C. Williams

Peter C. Ely

2 1870 Model.