

No. 622,527.

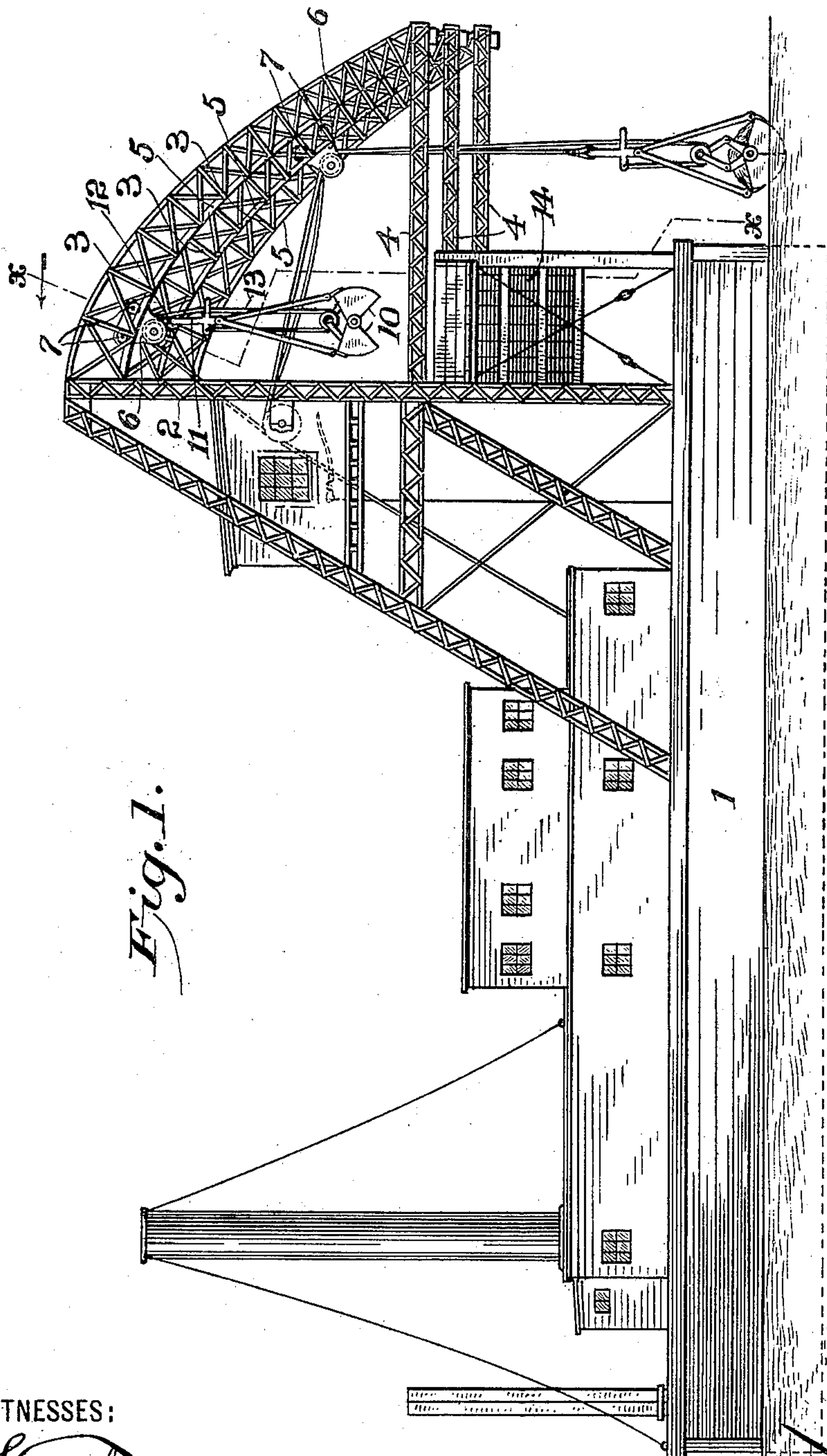
Patented Apr. 4, 1899.

W. H. O'HARA.
DREDGING APPARATUS.

(Application filed Feb. 6, 1899.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

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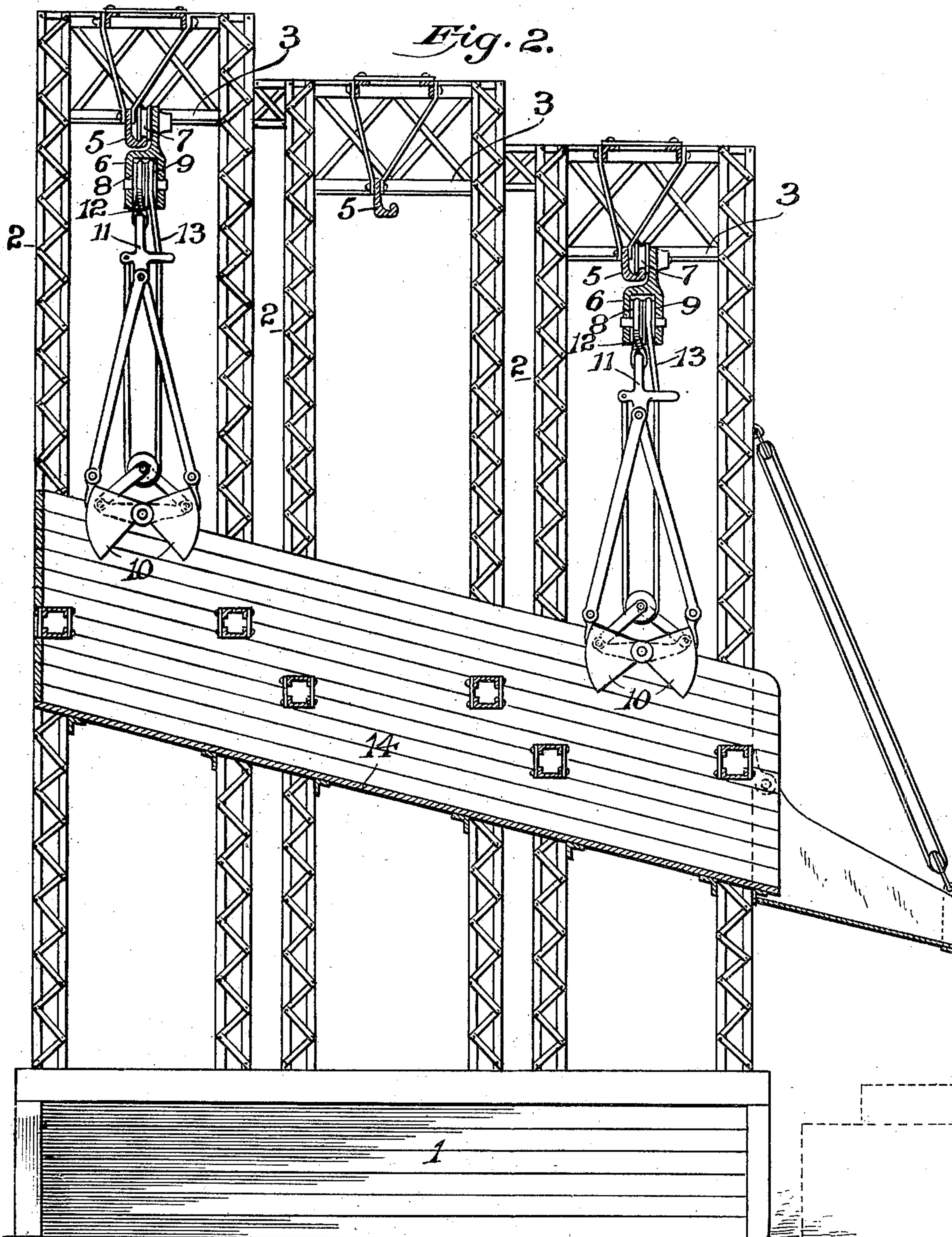
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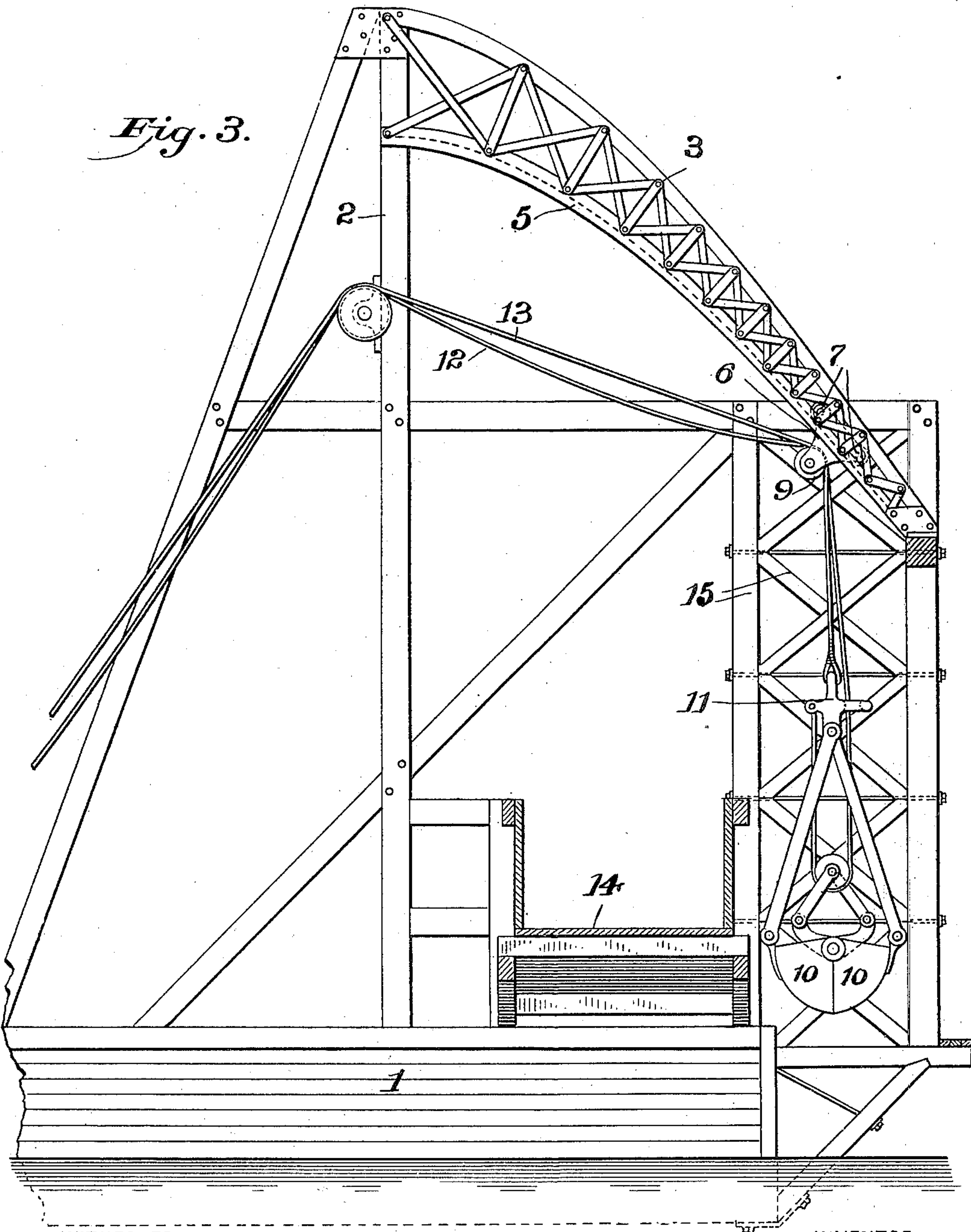
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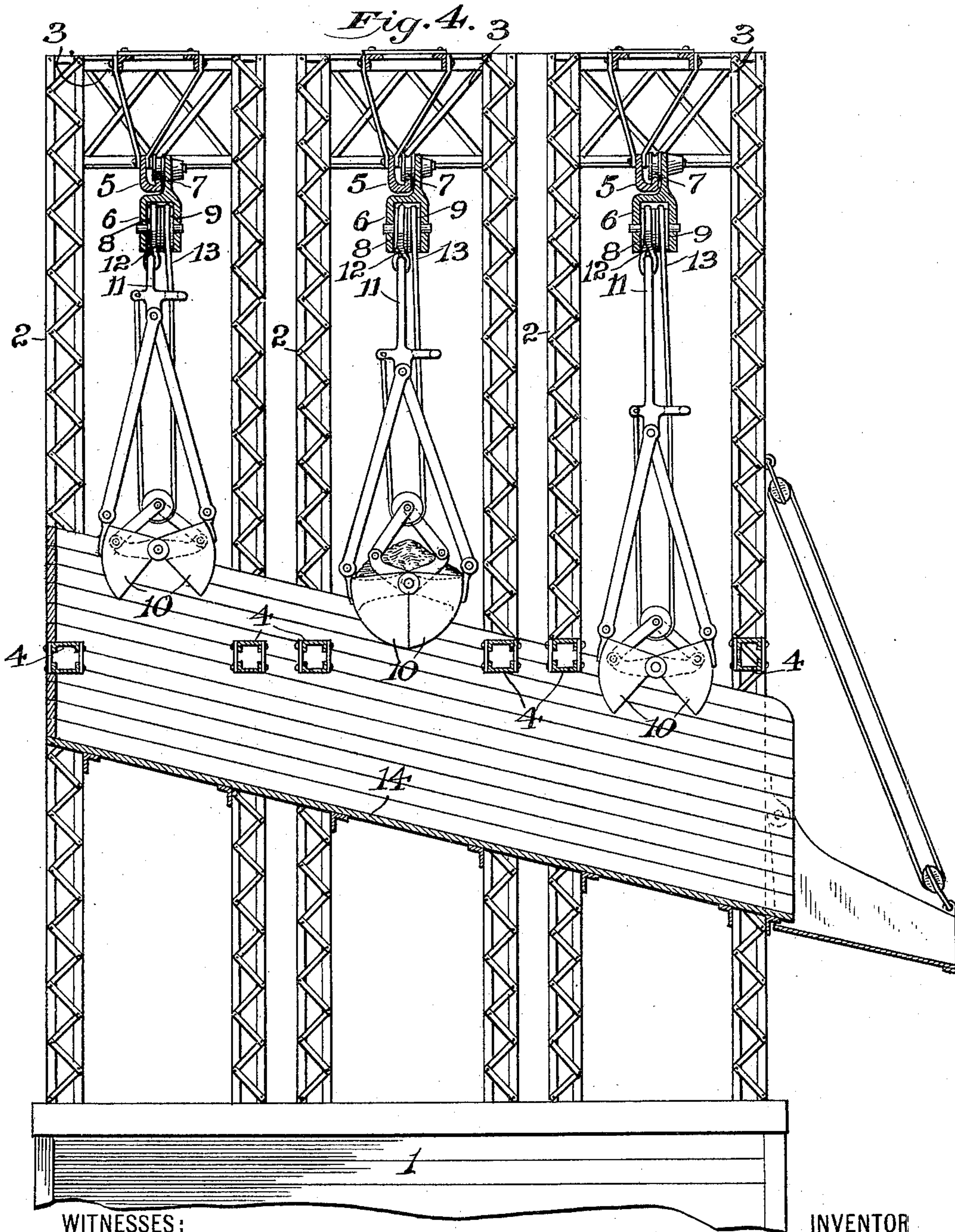
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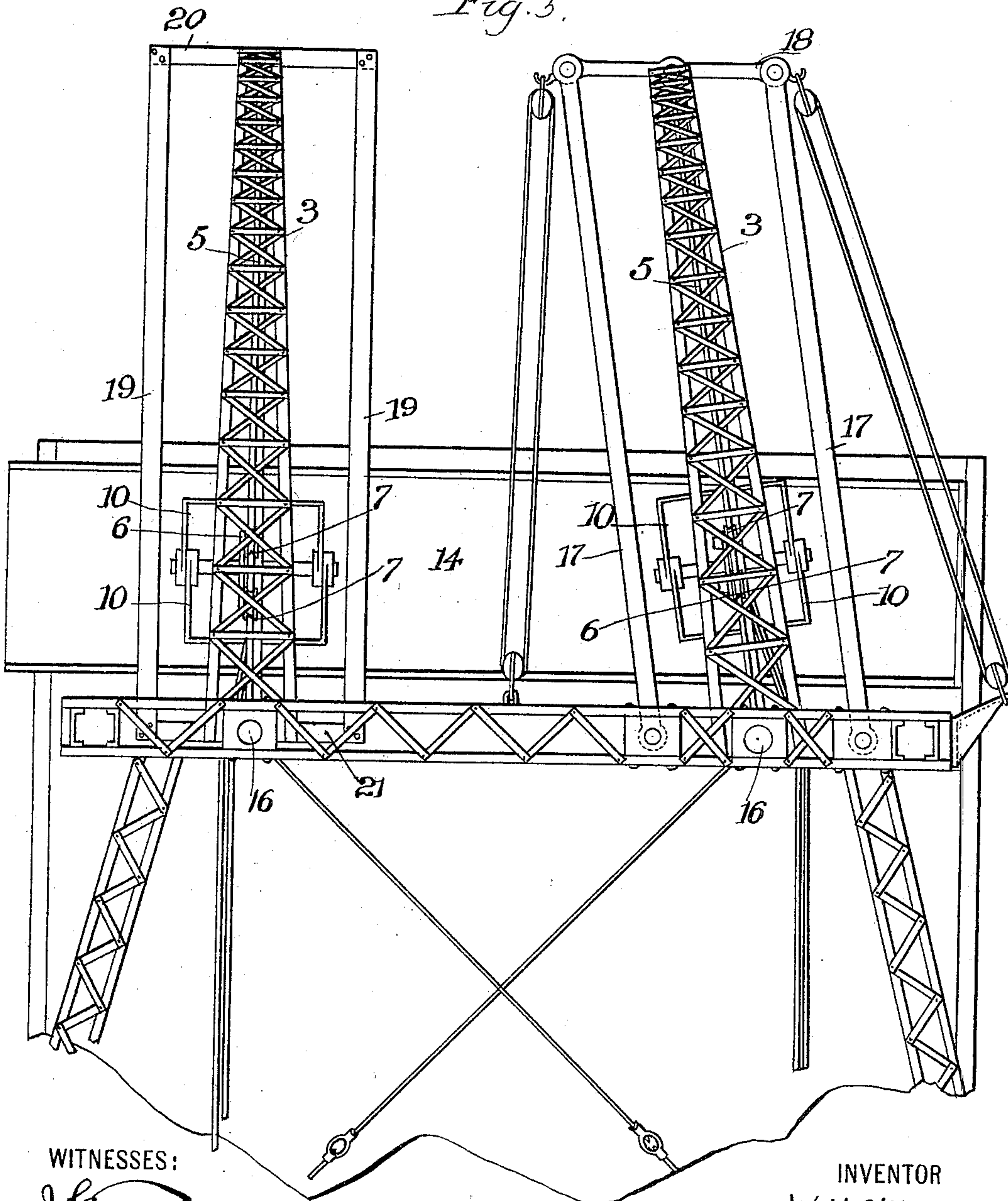
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Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM H. O'HARA, OF NEW YORK, N. Y.

DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 622,527, dated April 4, 1899.

Application filed February 6, 1899. Serial No. 704,655. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. O'HARA, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Dredging Apparatus; 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 certain new and useful improvements in dredging apparatus, and has the following objects in view: first, the adaptation of a plurality of jibs, each carrying an inclined track supporting trolley-carriages, and a series of digging-clams suspended from said carriages in each instance; second, to obtain the maximum efficiency of the digging-clams by discharging the spoil into a stationary inclined chute on the dredge, the point of such discharge being at a minimum distance from the place of dredging; third, to enable the digging-clams to operate throughout a considerable area without moving the boat itself; fourth, to discharge the spoil from a plurality of digging-clams into a stationary inclined chute without the use of auxiliary chutes; fifth, to discharge the spoil from the digging-clams always at the same elevation above the chute.

With these ends in view my invention consists in certain details of construction and combination of parts, such as will be hereinafter fully set forth and then specifically be designated by the claims.

In order that those skilled in the art to which my invention appertains may more fully understand the same, I will proceed to describe its construction and operation, reference being had to the accompanying drawings, which form a part of this application, and in which—

Figure 1 is a side elevation of my improved apparatus; Fig. 2, a section at the line xx of Fig. 1, looking in the direction of the arrow; Fig. 3, a broken sectional elevation illustrating a modification wherein the digging-clams are confined and guided within a cage attached to the hull of the boat; Fig. 4, a view similar to Fig. 2, but illustrating a modified

construction whereby the digging-clams discharge the spoil at the same elevation above the inclined chute; and Fig. 5 is a broken plan view illustrating a modification wherein the jibs are arranged to swing after the manner of a crane.

Similar numbers of reference denote like parts in the several figures of the drawings.

In all the views of the drawings I have shown the same elevation of the digging-clams for the purposes of a clearer understanding of my invention, and I might further add that the twisting of the cables as the clams are elevated or lowered causes various elevations to be presented from the same point of view, and I merely mention this feature in order that it will be clearly understood that there is no defect in the drawings.

Heretofore dredging apparatus has been provided in which a plurality of digging-clams were carried and operated at one end of the boat in vertical guide-cages and the spoil has been discharged into a movable auxiliary chute prior to the delivery of such spoil into a conveyer which delivered the spoil into a scow or any proper receptacle; but great difficulties have attended the use of this movable auxiliary chute in that it had to be arranged to swing into and out of position to receive the spoil and to make way for the hoisting and lowering movements of the digging-clams, and the present invention aims to do away entirely with this auxiliary chute and to utilize a jib or bowstring-girder construction carrying inclined tracks and trolley-carriages as the means whereby the digging-clams may be supported and conveyed into proper dumping position above the inclined chute; but a serious drawback would exist in the use of such jibs or girders except in the instance of a single digging-clam, for the reason that a gang of such jibs or girders being of the same height the spoil from the various clams would be discharged into the inclined chute at different elevations, the result being that no chute or dredging-boat could withstand the impact of the spoils.

In my present improvement I have succeeded in utilizing a plurality of jibs or bowstring-girders in connection with but a single chute, and the spoils are discharged always

at the same elevation above this chute, all of which will be readily understood from the following description.

I have heretofore used the two terms "jib" and "bowstring-girder," since they both answer fairly to the construction which I employ—namely, a curved arch-like structure secured at the upper end to a vertical support or buttress, such structure being subtended by what might be termed a "strut" or "cord;" but in order to have a uniform term I shall hereinafter refer to this arch construction as a "jib," while the lower braces I will call "struts;" but it must be understood that the matter of mere terms is immaterial and that the upper structure may be a true arch, a true incline, or might extend in a parabolic curve.

1 is the hull of the boat, and 2 is a vertical frame or buttress properly secured and braced in any ordinary manner upon the boat and preferably at the bow thereof.

3 are bow-jibs whose upper extremities are secured to the frame, while their lower extremities are connected with said frame by struts 4. 5 are tracks supported by and depending from said jibs and extending throughout the length of the same, said tracks being in different horizontal planes for the purpose presently to be explained. 6 are trolley-carriages having trolley-wheels 7, which rest and are adapted to travel upon these several tracks, and 8 9 are pulleys journaled within the lower portion of each trolley-carriage.

The digging-clams which I employ are of ordinary construction and operation, and I will not herein enter into any description of the same, but will merely designate them by the numeral 10. The head from which the clams are suspended is designated by the numeral 11, and to this head the cable 12 is secured. 13 is the cable by means of which the opening and closing of the clams is controlled, and these cables 12 13 are passed, respectively, over the pulleys 8 9, and thence to the usual winding-drums, (not shown,) which are controlled and operated by any approved motive power.

14 is an inclined chute supported in position at the forward end of the boat, immediately below the jibs, at or about the point where they adjoin the frame 2. The tracks 5 are in different horizontal planes, as hereinbefore set forth; but these planes are in a single inclined plane, which is parallel with the plane of the chute 14, so that it will be readily understood that when the cables have been operated to lift the clams into positions immediately above the chute said clams will all be at the same distance from said chute, so that the spoils will in all instances be deposited with substantially the same minimum of impact against the chute.

In lowering the clams the cables are both slackened so that the clams will touch the soil to be dredged in open condition. The closing of the clams and the consequent dig-

ging function thereof are accomplished by the winding up or pulling of the cable 13 in the usual manner, and thereafter the hoisting of the clams is effected by the continued winding of said cable until the head 11 strikes the trolley-carriage 6, and then the continued winding of such cable will cause said trolley-carriage to travel upward along its track until the clams have been elevated and held suspended immediately above the chute. Then the slackening of said cable 13 will effect the opening of the clams and the spoil will be deposited therefrom immediately upon the chute, whence such spoils are conveyed to any suitable receptacle.

It will be readily understood that during the initial hoisting of the clams and until the head 11 strikes the trolley-carriage 6 there will be no upward movement of said trolley-carriage; but as soon as said head and trolley-carriage come in contact they will practically become one and the same thing, and the further winding of the cable 13 will effect the elevation of such trolley-carriage and head.

It will be noted that the struts 4 for the greater part of their distance overhang the bow of the boat, so that it will be clear that by providing suitable stops for the trolley-carriages—such as cross-pins inserted through the jibs, or stop-chains whose ends are connected, respectively, to the trolley-carriages and the frame, or stop-blocks sliding on the tracks and controlled by ropes—the trolley-carriages may be arrested in their downward sliding movements in various vertical planes, so that the lowering, digging, and hoisting of the clams may be accomplished nearer to or farther away from the bow of the boat, as may be desired. By arresting and controlling the limits of the downward movements of these trolley-carriages in the manner above described the dredging may be effected for a considerable distance in advance of the boat without moving the latter, while in all instances the spoil is deposited in the same vertical plane upon a single inclined chute and from heights always at the same distance from said chute.

If desired, the clams may operate and be guided within any suitable cage 15, as shown at Fig. 3, secured to the boat, and while such construction may be advisable while dredging in a heavy sea nevertheless it is rather a rare precaution than a necessity. In case such cage construction should be used the inner portion of the cage would of course be open, so as to permit the hoisting of the clams along the tracks of the jibs to the point at which the spoils are to be dumped.

In some instances it may be found advisable to arrange the jibs so that they will swing after the manner of cranes, and I have therefore shown at Fig. 5 a construction wherein the jibs are pivoted at 16 to the frame, at the top thereof. In this construction (shown at Fig. 5) I have illustrated two ways in which this pivoting may be accomplished, the con-

struction at the right of the figure showing struts 17, pivoted to the frame and to a cross-piece 18, which latter is pivoted at its center to the lower end of the jib, while at the left of this figure I have shown struts 19, rigidly secured at their ends to cross-pieces 20 21, the inner end of which latter is pivoted to the frame 2 in a direct line with the pivotal point 16. In utilizing these constructions (shown at Fig. 5) the jibs are swung around by any suitable means until the vertical plane is reached in which the dredging is to be effected, and the clams are then hoisted and carried into dumping position in the manner hereinbefore set forth with respect to the construction shown at Fig. 1, and this hoisting of the clams may be accomplished without swinging back the jibs. I do not, therefore, wish to be limited to the stationary jibs, since the gist of my invention resides chiefly in the broad idea of providing a plurality of jibs and so equipping them that when the clams are hoisted and carried into dumping position they will all be at the same height above the chute. This proper delivery of the clams prior to dumping with respect to the inclined chute may be brought about by gradations in the tracks 5, as shown at Figs. 1 and 2, or the tracks may all be in the same horizontal plane, and the proper elevations in the digging-clams may be effected by making the heads 11 of different lengths, as shown at Fig. 4; but I prefer the former construction, since it is more compact, has less weight, will balance on the dredging-ground better, and is probably stronger.

In the operation of my improvement the clams are lowered into digging position by slackening the cables 12 13, and the clams are closed and elevated into dumping position by winding up these cables, care always being taken to keep the cable 13 taut and under strain, so that the load is mainly hoisted thereby. The spoils pass down the chute into any suitable scow, or they may be delivered into a pump, such as usually employed in the reclaiming of land.

I do not wish to be understood as laying any claim in a broad sense to a jib or bow-string-girder construction carrying an inclined track which supports a trolley-carriage; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. In a dredging apparatus, the combination of a plurality of bow-jibs carrying inclined tracks, trolley-carriages adapted to travel on said tracks, a series of independent

digging-clams suspended from said carriages, means for operating said clams, the single inclined chute supported by the dredging-boat, and means for effecting the delivery of said clams in dumping position at a uniform distance from said chute, substantially as set forth.

2. In a dredging apparatus, the combination of a plurality of bow-jibs secured to and overhanging the dredging-boat and provided with tracks, the inclined chute supported at the bow of said boat immediately beneath the upper portions of said tracks; the trolley-carriages provided with trolley-wheels adapted to travel on said tracks, the two pulleys journaled in the lower portion of each trolley-carriage, the digging-clams, the cables extending from said clams over said pulleys, suitable mechanism for hoisting and lowering said cables, and means whereby said clams are held in suspension over said chute at a uniform distance therefrom, substantially as set forth.

3. In a dredging apparatus, the combination of a plurality of jibs secured side by side to and overhanging the dredging-boat and provided with tracks, the inclined chute supported at the bow of the boat immediately beneath the upper portions of said tracks, carriages adapted to travel along said tracks, the digging-clams suspended from said carriages, cables attached to said clams, and means whereby the clams are delivered in dumping position immediately above said chute and at the same distance therefrom, substantially as set forth.

4. In a dredging apparatus, the combination of a plurality of jibs arranged side by side and secured to and overhanging the dredging-boat and provided with tracks in different horizontal planes, the chute supported at the bow of the boat immediately beneath the upper portions of said tracks and inclined to a plane parallel with the inclined plane passed through said tracks, the carriages provided with trolleys adapted to travel on said tracks and having journaled in their lower portions pulleys, the digging-clams, and the cables extending from said clams over said pulleys to suitable hoisting and lowering mechanism, substantially as set forth.

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

WILLIAM H. O'HARA.

Witnesses:

F. W. SMITH, Jr.,
M. T. LONGDEN.