

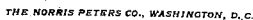
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D. O. PAIGE.

HOIST FOR HANDLING TANK SECTIONS.

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UNITED STATES PATENT OFFICE.

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HOIST FOR HANDLING TANK-SECTIONS.

No. 859,513.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID O. PAIGE, of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Hoists for Handling Tank-Sections; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

10 My present invention relates to improvements in hoisting apparatus, and it has for its purpose to provide an apparatus of this kind which is particularly useful in handling tank sections or other bodies which are usually massive, and which during the course of their manufacture or erection, must necessarily be pivoted or otherwise positioned in order to facilitate the subsequent operations to which the tank sections or other bodies are to be subjected.

20 To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is an elevation of a hoisting apparatus constructed in accordance with my invention showing a tank section suspended in a horizontal position in full lines, the pivoted position which it will subsequently occupy when turned being indicated in dotted lines. Fig. 2 is a fragmentary end view of the device shown in Fig. 1 indicating the relative positions of the tank section. Fig. 3 is a sectional view on the line 3—3 of Fig. 1 showing the locking bolts in section. Fig. 4 is a sectional view on the line 4—4 of Fig. 3 showing the coöperative engagement of the locking bolts and the rivet holes in the flange of a tank section. Fig. 5 is a sectional view on the line 5—5 of Fig. 1 showing the locking device for securing the suspension members in adjusted positions on the supporting beam, and Fig. 6 is a detail view of another form of device constructed in accordance with my invention which is adapted to be used in connection with tank sections, the flanges of which have not been perforated.

The same numerals of reference in the several figures indicate similar parts.

45 An apparatus of the kind described constructed in accordance with my invention embodies in its present form a supporting beam 1 which is preferably composed of an I-beam which may be of sufficient length to enable bodies of the desired width to be suspended from it, and it is provided intermediately of its ends with an attaching ring 2, the latter being adapted to receive the usual hook of a suitable hoisting device.

In the manufacture of tank sections and similar bodies which are usually operated upon in different parts of the shop, it is preferable to use a hoisting crane

which is capable of being moved into various positions, and in the present form of my invention I have shown a hoist of this kind which embodies a fluid pressure cylinder 3 having a suitable connection with a source of fluid pressure supply, and is provided with a controlling valve 4 by means of which a piston 5 which operates therein may be controlled, said piston being provided with a hook 6 to engage the ring 2 of the beam. This cylinder 3 is supported through the hook 7 from a carriage 8 which is mounted on rollers 9, the latter being arranged to travel along the track or support 10. On the beam 1 at either side of the supporting ring 2 are provided a series of spaced notches or apertures 11, and over the lower flange of this beam in which these apertures are formed are the brackets 12—12 which are arranged to slide longitudinally of the beam and are provided with locking devices for retaining them in the desired adjusted positions longitudinally of the beam. This locking device in the present instance embodies a pin 13 which is arranged to pass through apertures in the bracket and through the apertures or notches 11 in the beam to prevent relative longitudinal motion of the parts, a wire or other connection 14 being provided for preventing the loss of the pin 13.

From the brackets 12 are suspended the rods 15, and the lower end of each of these rods is attached to a swivel eye 16, and each of these eyes is pivotally connected by the pin 17 to the attaching devices for the tank sections. These attaching devices which are particularly adapted for use in handling tank sections which are provided with oppositely arranged peripheral flanges and which are to be employed on sections, the flanges of which have been perforated in the usual way to receive the bolts or rivets which are to secure the tank sections together when they are assembled, embody in their present form a bar or member 18, one end of which is provided with one or more projections or extensions 19 which are formed to enter one or more apertures in the flange, and the opposite end of this bar is recessed as at 20 to receive the longitudinally movable bolts 21 which are normally operated upon by springs 22 which are inclosed within the bar 18 and rest behind each bolt, and to each of these bolts is attached a handle 23 which is arranged on the exterior of the bar and is connected to each of the bolts by the screws or pins 24, the latter operating in the slots 25 of the bar to enable the handle 23, and consequently each of the bolts 20, to be simultaneously withdrawn in a direction longitudinally of the bar. Each of these bars 18 is of a length just sufficient to pass freely between the oppositely-arranged flanges of the tank section which are all approximately of uniform dimensions for tanks of a given size, and in placing the bars 18 in position, the relatively fixed projections 19 are first inserted in the apertures in one of the flanges, and while the bolts 21

are withdrawn by the handle 23, the opposite end of the bar is swung into position between the flanges and the handle 23 is released, allowing the bolts 21 to be forced outwardly under the action of the springs 22 into the adjacent apertures 21^a of the flange, and this will obviously lock the bar immovably in position. With the attaching devices secured to the tank in this manner fluid pressure is admitted to the cylinder 3 causing the piston 5 to rise and elevate the beam 1, and this will

10 raise the tank section sufficiently high to enable it to be swung from a horizontal position into a vertical position so that it may rest upon its periphery and this is permitted by the pivotal connection between the swivel eyes 16 which are attached to the suspension rods 15

15 and the bars 18 of the attaching devices. In the same way the tank section may be lifted while it rests upon its periphery and then swung into a substantially horizontal position, and this is useful in facilitating the erection of the tanks, as it enables the different sections

20 to be superposed in relative horizontal positions.

In order to enable tank sections or other objects of different diameters to be accommodated by the supporting beam, the brackets 12 are adjustable relatively to one another on the beam 1 and this will enable the

25 attaching devices to be suspended from the beam at the proper distance apart so that they can be easily applied to the object which is to be lifted or otherwise handled, the pins 13 operating to retain these brackets in their adjusted positions. In moving the brackets

30 12 longitudinally of the beam 1 they should be moved together and equally spaced from the center of the supporting ring 2, for it is particularly desirable to maintain the beam 1 in equilibrium. In handling tank sections the flanges of which have not been perforated, a

35 clamp similar to that shown in Fig. 6 may be employed which is attached by the swivel 16 to the suspension rod 15 in the usual way, and it comprises a bar 26 which is provided at one end with an abutment 27, and opposite to this abutment is provided a clamping screw 28

40 which is arranged to operate upon one of the flanges of the tank section to clamp it firmly against the abutment 27, and at the opposite end of the bar 26 are provided the oppositely-arranged clamping screws 29 and 30 which are arranged preferably in alinement, and are

45 adapted to clamp the opposite flange of a tank section between them, the pivotal connection between the swivel 16 and the bar 26 enabling the tank section or other object to be handled in a manner similar to that hereinbefore described. By providing the relatively

50 fixed abutment 27 at one end of this bar and the oppositely arranged adjusting screws 29 and 30 at the opposite end thereof, variations in the distance between the flanges of the tank sections may be compensated for, and therefore the use of clamps of different sizes is unnecessary. An apparatus for hoisting and otherwise

55 handling tank sections and similar objects is particularly useful when these tank sections have been provided with a lining of enamel or other frangible material which is liable to become damaged or otherwise injured should the usual method of attaching the crane

60 or hoist to the objects be employed, for it will be obvious that the attaching devices are applied to the sections entirely at their outer surfaces, and in a way that will not strain the sections when they are lifted, and in

65 this way all danger of fracturing or otherwise damaging

the enamel is avoided, for it will be obvious that the attaching devices do not come in contact with the enameled surfaces, and as the flanges of the tank sections are of sufficient strength to sustain the weight of the sections, the hoisting apparatus may be employed

70 to good advantage in lifting the tank section from a horizontal position to enable it to be swung around and stood on its periphery in order that it may be readily rolled into any part of the shop.

I claim as my invention:

1. In hoisting apparatus, the combination with a support, a hoist suspended therefrom, and a beam connected to the hoist, of attaching devices supported on the beam and spaced longitudinally thereof, each embodying a member carrying means for detachably locking it to an object and pivotal connections between the beam and the attaching devices for permitting the latter to turn in planes transverse to the beam. 75
2. In hoisting apparatus, the combination with a support, and a hoist supported thereby, of a flanged supporting beam attached intermediately of its ends to the hoist and attaching devices slidably mounted on the flanges of the beam at either side of its point of attachment and capable of being adjusted relatively to each other and means for locking said attaching devices in adjusted relation. 80 85
3. In hoisting apparatus, the combination with a support, and a hoist supported thereby, of a supporting beam attached intermediately of its ends to the hoist, brackets movable longitudinally of the beam at opposite sides of the point of attachment thereof, locking devices for retaining the said brackets in adjusted positions, and attaching devices supported by the brackets. 90 95
4. In hoisting apparatus, the combination with a support, and a hoist suspended therefrom, of a supporting beam attached intermediately of its ends and having a flange at its lower edge provided with spaced notches extending toward its ends in either direction from its center, brackets adjustable longitudinally on the flange of the beam and carrying attaching devices, and locking devices adapted to cooperate with the notches of the beam for retaining the brackets in adjusted positions. 100 105
5. In hoisting apparatus for handling rings having oppositely-arranged perforated flanges, the combination with a support and a hoist connected thereto, of a beam, a member attached to the hoist and adapted to enter between the flanges of the ring and having oppositely-arranged attaching portions thereon for engaging the flange of the ring, one of said portions being movable relatively to the other for engaging and disengaging the said member and the ring and a pivotal connection between the hoist and said member for permitting the latter to swing in a vertical plane arranged transversely of said beam. 110 115
6. In hoisting apparatus, the combination with a support and a hoist connected thereto, of a bar pivotally connected at its center to the hoist and sets of attaching devices provided at either end of the bar, one of said sets of devices being adjustable relatively to the other. 120 125
7. In hoisting apparatus, the combination with a support and a hoist connected thereto, of a member attached to the hoist and attaching projections extending in opposite directions on said member, the projections at one end of the member being adjustable relatively to those at the opposite end and an operating handle carried by said adjustable projections. 130 135
8. In hoisting apparatus for handling rings, the flanges of which are perforated, the combination with a support and a hoist connected thereto, of a member pivotally attached to the hoist to swing in a vertical plane and having sets of oppositely-arranged projections on each end thereof arranged to enter the perforations in the flanges of the ring. 140 145
9. In hoisting apparatus for handling rings having oppositely-arranged spaced flanges thereon, the combination with a support and a hoist connected thereto, of a pair of attaching devices supported by the hoist to turn in vertical planes, each adapted to cooperate with the opposite sides of the ring, embodying a bar having projections upon the ends thereof adapted to cooperate with the flanges at

opposite sides of the ring, one of the projections being adjustable relatively to the other.

10. In hoisting apparatus for use in handling annular tank sections provided with apertured spaced flanges, the combination with a support and a hoist connected thereto, of a pair of reversely arranged attaching devices pivoted to turn on a common horizontal axis each embodying a bar of a length sufficient to enter between the flanges at one side of the section, projections at one end of the bar arranged to cooperate with the apertures in one of the flanges, and a movable locking bolt at the opposite end of the bar arranged to cooperate with the apertures in the opposite flanges.

11. In hoisting apparatus, the combination with a support and a hoist connected thereto, of a pair of attaching devices supported by the hoist to swing in vertical planes, each embodying a bar pivoted intermediately and having a longitudinally-extending projection at one end, a pair of relatively movable bolts mounted in the opposite end of the bar and movable in a direction longitudinally of the latter, and means operating upon said bolts to move them into cooperative relation with the respective flange section.

12. In hoisting apparatus, the combination with a support and a hoist connected thereto, of a beam connected to the hoist having a pair of attaching devices pivoted there-

on to turn in vertical planes each embodying a bar having an outwardly extending projection at one end, a relatively movable bolt mounted in the opposite end of the bar and movable in a direction longitudinally of the latter, a spring operating upon the bolt to move it outwardly from the end of the bar.

13. In hoisting apparatus, the combination with a support and a hoist connected thereto, of a bar connected to the hoist having an outwardly-extending projection at one end, a plurality of bolts mounted in the opposite end of the bar and movable in a direction longitudinally of the latter, and an operating member connected to each of the said bolts for operating them simultaneously.

14. In hoisting apparatus, the combination with a support, a hoist connected thereto, and a supporting beam pivotally connected at a point intermediate its ends to the hoist, of attaching devices connected to the beam at either side of its point of attachment to the hoist, and a pivotal connection between the said beam and the attaching devices for permitting the latter to rotate on axes parallel to the length of the beam.

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Witnesses:

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