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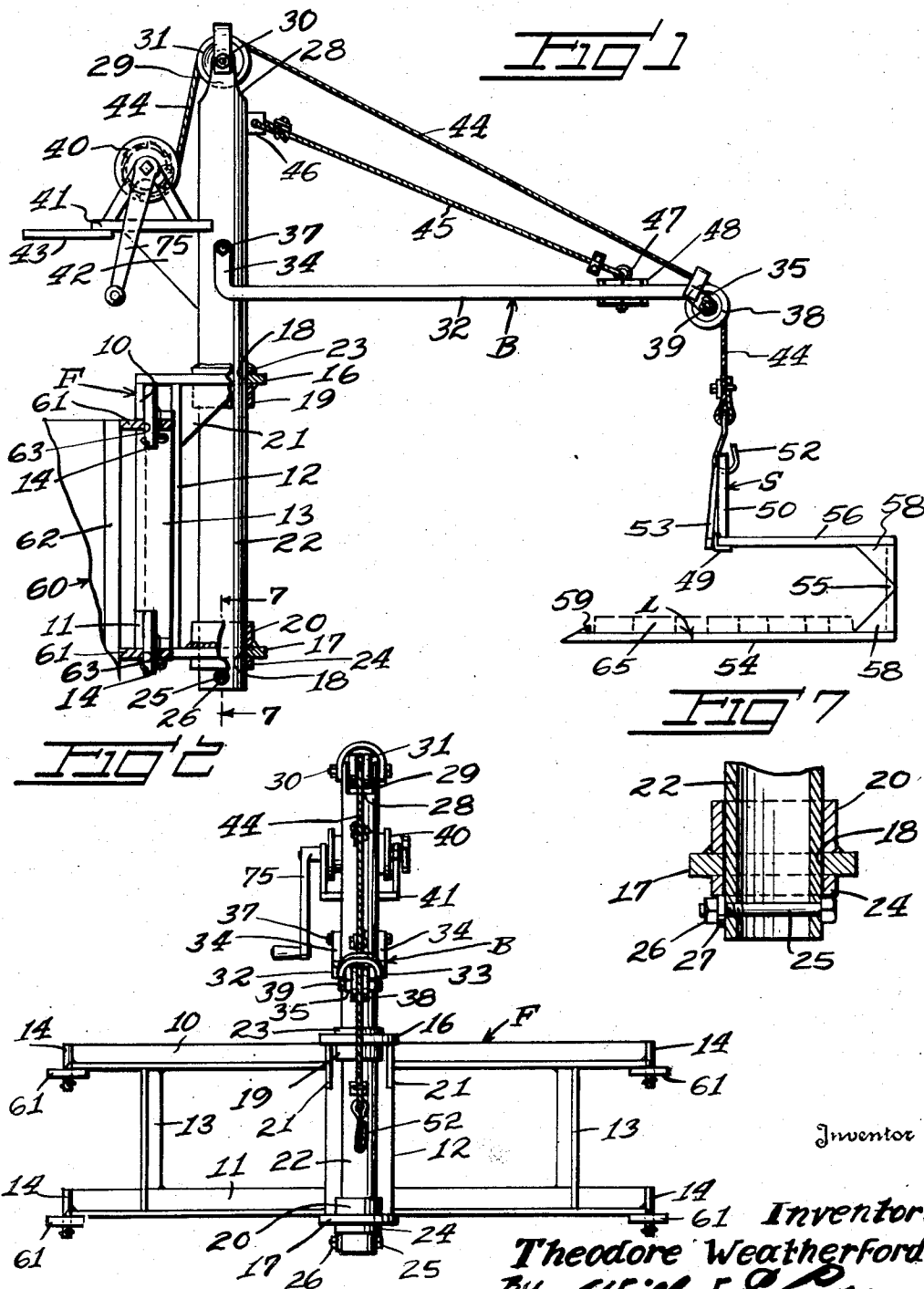
T. WEATHERFORD

2,646,893

HOIST

Filed Sept. 3, 1948

2 Sheets-Sheet 1



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FIG 3

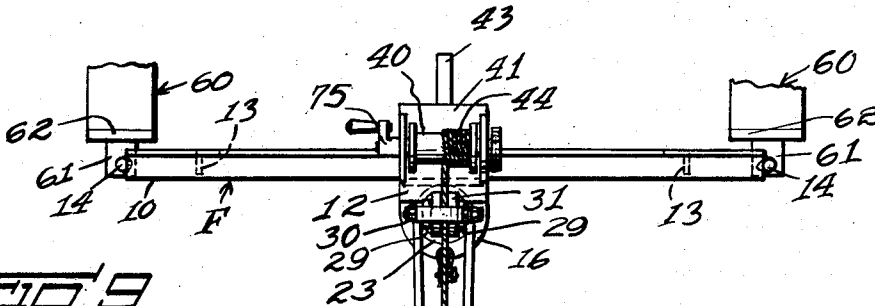


FIG 9

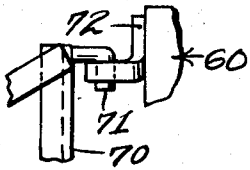


FIG 6

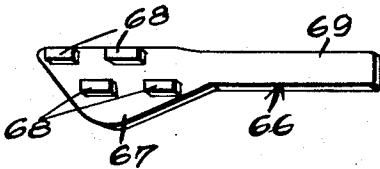


FIG 4

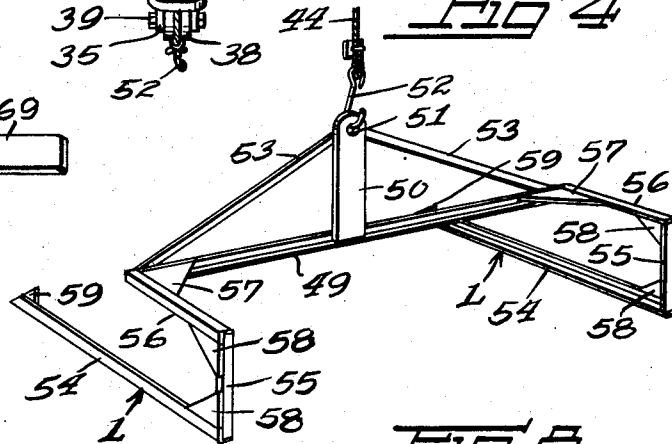


FIG 5

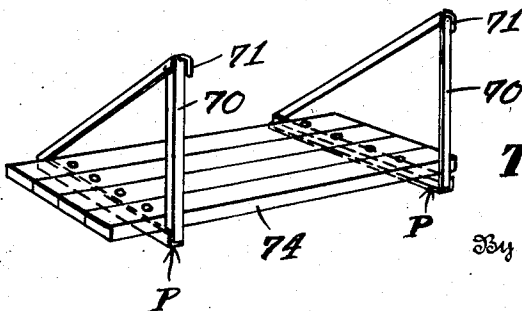
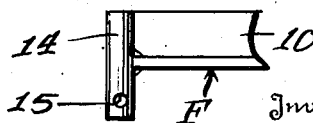


FIG 8



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UNITED STATES PATENT OFFICE

2,646,893

HOIST

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2 Claims. (Cl. 212—61)

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This invention relates to hoists and more particularly to hoists adapted to raise boards and the like for the purpose of erecting scaffolds used in constructing of large steel tanks or the like. The erecting of such scaffolds by hand is a hard, dangerous, slow job, one man standing on a lower scaffold level and passing boards up, one by one, to another man on the next higher level.

The primary object of the invention is to provide a hoist by means of which the boards can be raised easily and safely by one man to the desired level.

Another object of the invention is to provide a hoist adapted to be removably mounted on a movable support, such as a truck used to transport the steel plates for the construction of the tank.

A further object of the invention is to provide a hoist of the character indicated above comprising a structural frame adapted to be removably mounted on a truck or the like and a mast supporting the load lifting means of the hoist and removably mounted on the frame and rotatable about its own axis.

Other objects of the invention not specifically mentioned may appear in the following specification describing the invention with reference to the accompanying drawings illustrating a preferred embodiment of the invention. It is, however, to be understood, that the invention is not to be limited or restricted to the exact construction, arrangement and combination of parts described in the specification and shown in the drawings, but that such changes and modifications can be made, which fall within the scope of the claims appended hereto and specifically pointing out the novel features of the invention.

In the several figures of the accompanying drawings similar parts are indicated by similar reference characters and

Figure 1 is a side elevational view illustrating an apparatus constructed in accordance with an embodiment of the invention, parts being in section and an associated carriage diametrically indicated;

Figure 2 is a view in front elevation of the apparatus with the load bracket omitted;

Figure 3 is a top plan view of the apparatus as shown in Figure 2;

Figure 4 is a view in perspective of the load bracket as herein comprised;

Figure 5 is a view in perspective of the operator's platform supplied;

Figure 6 is a view in perspective of the hand wrench;

Figure 7 is an enlarged detail sectional view taken substantially on the line 7—7 of Figure 1;

Figure 8 is an enlarged fragmentary view in elevation of the rear portion of a top member of the frame; and

Figure 9 an enlarged fragmentary view in elevation showing a means for mounting the operator's platform.

The hoist as disclosed in the accompanying drawings comprises an elongated substantially rectangular base frame F having a top member 10 and a bottom member 11. Preferably these members are made from angle iron and are arranged so that one of the legs of each member is in substantially horizontal position and the other leg extends upwardly therefrom. A substantially rectangular plate 12 is welded onto the edges of the two horizontal legs of and approximately centrally between the end of the frame members 10 and 11 so that the lower end edge of the plate 12 is located approximately in the same plane with the under side of the bottom frame member 11, and that the upper end edge is arranged approximately in the same plane with the upper edge of the top frame member 10. Adjacent the ends of the said frame members stiffeners 13 are secured between them, and are preferably made from angle iron. In each end surface of the top and bottom frame members a pin 14 is welded and extends downwardly beyond the horizontally arranged leg of the respective frame member. A diametrical hole 15 extends through each pin 14 adjacent to its lower end.

A bracket plate 16 is welded onto the upper edges of the central frame plate 12 and the top frame member 10 and another bracket plate 17 is welded to the under side of the bottom frame member 11 and to the lower edge of the central frame plate 12. Both bracket plates 16 and 17 extend beyond the central frame plate 12 and in each bracket plate a hole 18 is provided adjacent to the free end edge of said plate, so that the holes are arranged coaxially. A sleeve 19 is secured to the under side of the upper bracket plate 16 by welding or the like and another sleeve 20 is firmly attached in a similar manner to the upper surface of the lower bracket plate 17 so that said sleeves are located coaxially with the holes 18. A brace 21 is fastened by welding or the like to the central frame plate 12 adjacent to each side edge thereof and extends slantingly upward. The upper edge of each brace is firmly secured to the under side of the top bracket plate 16 to reinforce the same.

A mast 22 is made preferably from a pipe and

fits rotatably in the sleeves 19 and 20. A collar 23 surrounds the mast and is secured in position thereon, so that the major portion of the mast extends upwardly from the upper bracket plate 16, when the collar 23 rests on said bracket plate in the manner of an end thrust bearing. The lower end portion of the mast 22 projects beyond the bottom bracket plate 17, and a loose collar 24 surrounding this mast portion is held in position by means of a bolt 25 extending diametrically through the mast 22 and secured against accidental removal by a nut 26 and a washer 27.

Into the upper end portion of the mast 22 a notch 28 is cut forming diametrically opposite upwardly extending lugs 29, through which a bolt 30 extends. A sheave 31 is rotatably mounted on the bolt 30 between the lugs 29.

A boom B comprises a right hand boom member 32 and a left hand boom member 33. The boom members are made preferably from flat bars and one end portion of each boom member is provided with an arm 34 extending at an angle of approximately ninety degrees to the main portion of the boom member. The other end portion of each boom member is curved as at 35 to extend in the opposite direction to the arm 34. The two boom members 32 and 33 are connected with each other by means of cross braces 36 so that the arms 34 are adapted to be arranged longside of the mast 22. A bolt 37 extends diametrically through the mast and through the arms 34, so that the boom B is pivotally mounted on the mast in such a position that the arms 34 extend upwardly. The boom members are shaped so that they extend toward each other from the mast and a sheave 38 is rotatably mounted between the outer downwardly curved end portions 35 of the boom members 32 and 33 on a bolt 39 extending through said boom end portions.

A winch 40 is rigidly mounted on a platform 41 secured in any preferred conventional manner to the mast 22 so that it extends in opposite direction to the boom B and that the winch is located high enough above the frame F to provide operating clearance for said winch.

To reinforce the platform 41 a brace 42 is provided extending between and welded on the under surface of the platform and the mast 22. A hand lever 43 is secured to the platform 41 and projects therefrom radially for use in turning the mast 22 relatively to the base frame. A flexible lifting means 44, such as a cable, rope, chain or the like is secured with one of its end portions to the winch 40 and is trained over the two sheaves 31 and 38. On the other end portion of the flexible lifting means 44 a load support S is removably attached.

To prevent the boom B from pivoting further downwardly than desired, a flexible supporting member 45, such as a rope or the like is secured with one of its end portions to a perforated lug 46 formed on or fastened on the mast 22 adjacent to the upper end thereof and is attached with its other end portion to an eye bolt 47 extending through a pair of flat bars 48 arranged on the top and bottom edges of the boom B.

A load support S comprises a spreader bar 49 preferably made from angle iron. A flat hanger bar 50 is secured to one of the legs of the spreader bar centrally of the length thereof and extends at right angles to said bar. On the longitudinal center line of the hanger bar 50 a hole 51 is provided adjacent the end edge of the hanger bar. A hook 52 is secured in any conventional manner to the free end portion of the flexible

lifting means 44 and this hook is adapted to extend through the hole 51 and to hold the load support S. A tension rod 53 extends from each end of the spreader bar 49 inwardly and upwardly and is secured by welding or the like with its inner end portion to the hanger bar adjacent to its upper end edge, and with its other end portion to the respective end portion of the spreader bar 49.

A load supporting bracket L comprises a bottom member 54, an end member 55 and a top member 56. These members are preferably made from angle iron and two load supporting brackets L are provided. To each end portion of the spreader bar 49 one end portion of one of the top members 56 is secured so that it extends at right angles to said bar and is located at the same level therewith. To strengthen the connection between the spreader bar and the top members of the load supporting bracket L a gusset plate 57 is provided and fastened to each pair of these parts. The end member 55 of each load supporting bracket L connects the free end portion of the top member 56 with one end portion of the bottom member 54 of said bracket and extends at right angles to each of said members. Gusset plates 58 are arranged between the end member 55 and the top and bottom members 56 and 54 respectively. Each lower bracket member is approximately twice as long as the top bracket member and is provided at its free end with an upwardly extending stop 59.

On a movable base 60, such as a truck or the like four perforated bracket plates 61 are permanently secured on appropriately located upright members 62 and each pin 64 of the frame F is adapted to engage one of said bracket plates by being inserted into the holes 63 therein.

In this manner a hoist as described above can be removably mounted on the movable base 60, which is adapted to carry material for constructing a large tank or the like. Boards 65 and similar material for erecting a scaffold are placed on the two load supporting brackets L and the winch 40 is set in motion to lift the boards to the desired level. The load can be directed to the desired place by pivoting the mast 22 about its axis by means of the hand lever 43 or by pulling the movable base 60 into the desired position relative to the tank being constructed, by means of a hand wrench 66. This hand wrench comprises a back 67 on the under side of which four lugs 68 are formed or secured and arranged so that the shell of the tank can be engaged by said lugs. The back 67 has a handle 69 formed integrally therewith, to increase the leverage power of the wrench 66.

To facilitate the operation of the hoist embodied herein an operator's platform P is removably mounted on the movable base 60. It comprises two right angled triangular brackets 70 preferably made from angle iron. A hook 71 is welded onto one of the side members of each bracket 70 adjacent to one of the acute angles of said bracket. A pair of support bars 72 are permanently secured to the movable base 60 and the hooks 71 of the brackets 70 are adapted to engage the said bars, so that the brackets are removably supported by said bars. Planks 74, or the like, are placed on the brackets 70 to form the floor of the operator's platform P. The bars 72 may be formed in U shape if desired and are arranged at appropriate places on the base 60, to enable an operator located on the platform to reach and

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manipulate the hand lever 43 and the winch 40 easily and comfortably.

In the present embodiment of the invention, the winch 40 is illustrated as being manually rotated by a conventional crank 75. It is believed apparent however that other means may be used for this purpose.

I claim:

1. A device of the class described including a base frame, a mast rotatably and removably mounted on the frame, a boom pivotally mounted for vertical swinging movements on said mast, means extending between said mast and a point adjacent the free end of said boom for limiting the downward swinging movement of the latter, a sheave rotatably mounted on the top of the mast, a second sheave rotatably mounted on the free end portion of the boom, a platform secured to the mast, a winch mounted on the platform, a flexible load lifting means extending from the winch and trained over the two sheaves, and a detachable load support carried at the free end of said load lifting means.

2. The invention as defined in claim 1, with the said boom comprised in a pair of elongated spaced bars converging toward the outer ends

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thereof and their inner ends disposed at opposite sides of said mast and upturned, pivot means extending through said mast and the free ends of the upturned portions of said bars, and said second sheave journaled between the outer ends of said bars.

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