

July 20, 1954

G. A. ESTEL, JR

2,683,902

VEHICLE LIFT

Filed March 16, 1950

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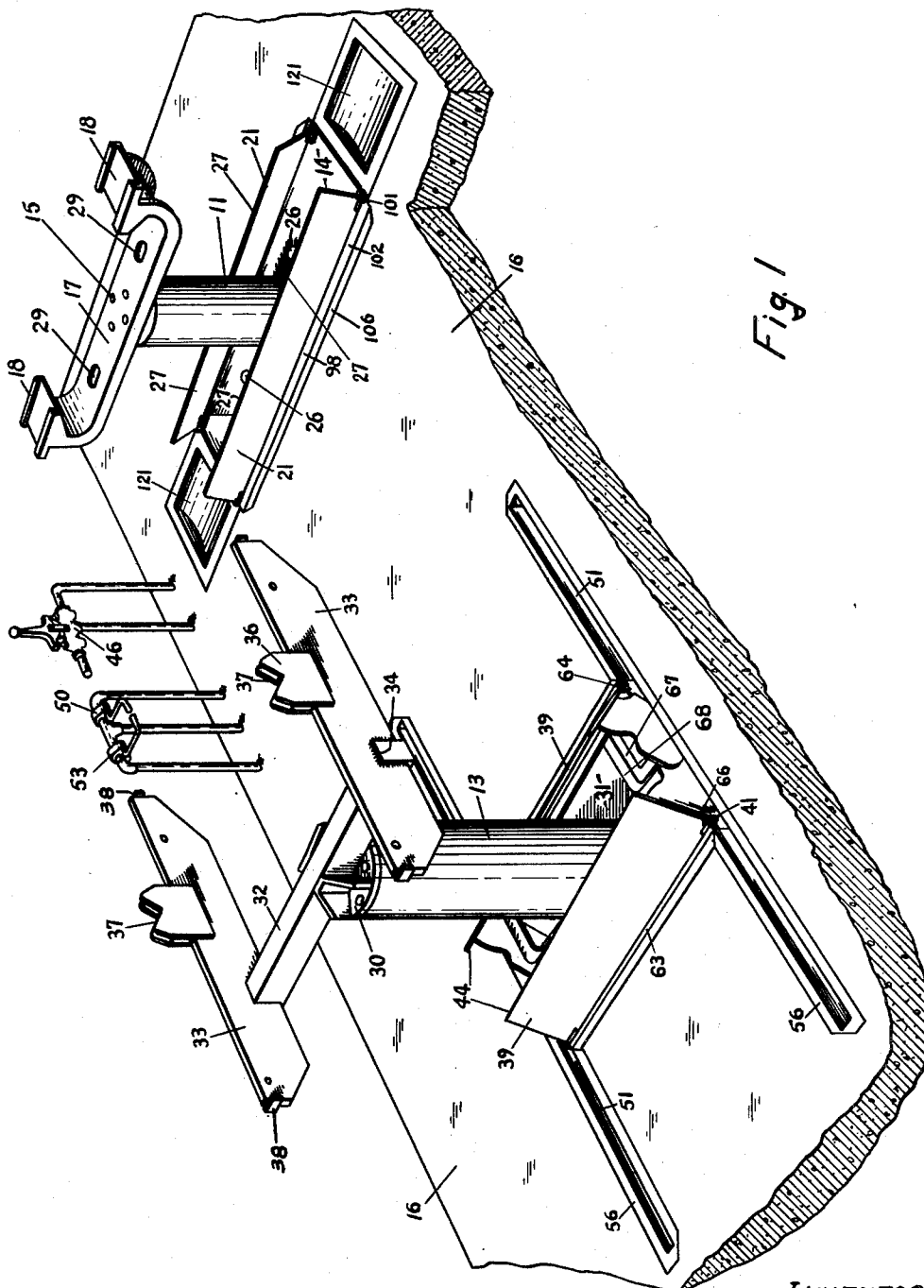


Fig. 1

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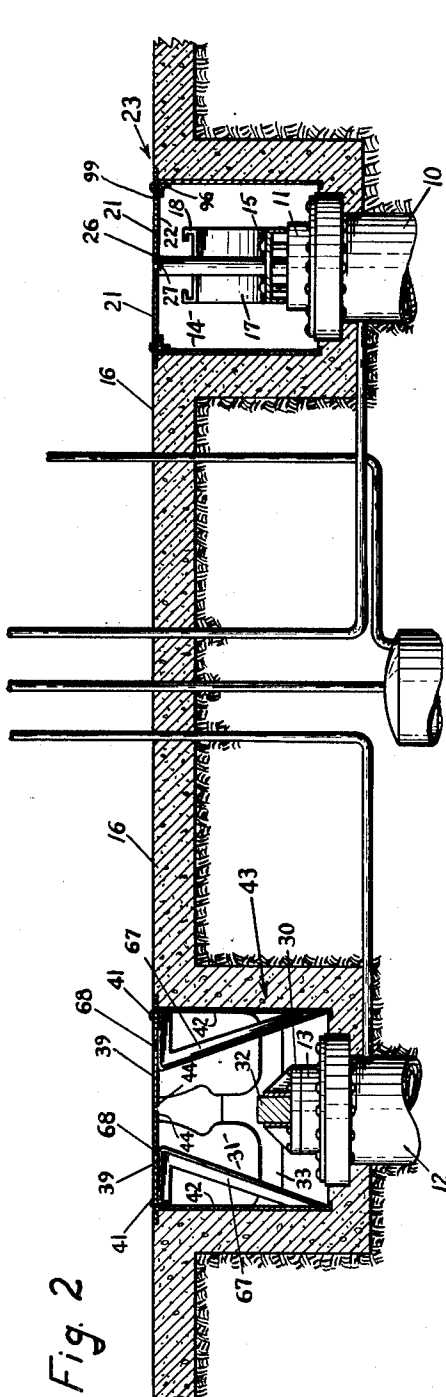
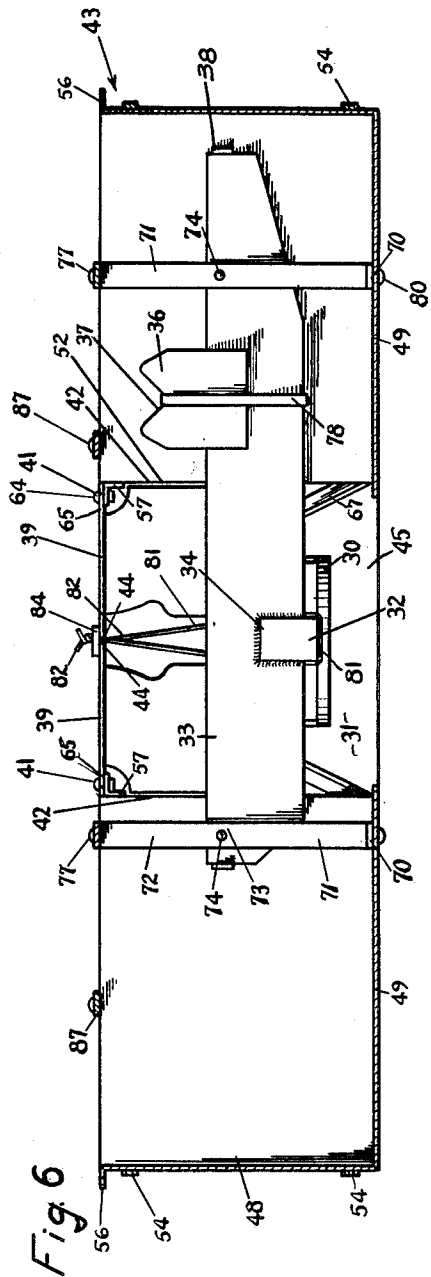
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Filed March 16, 1950

4 Sheets-Sheet 2



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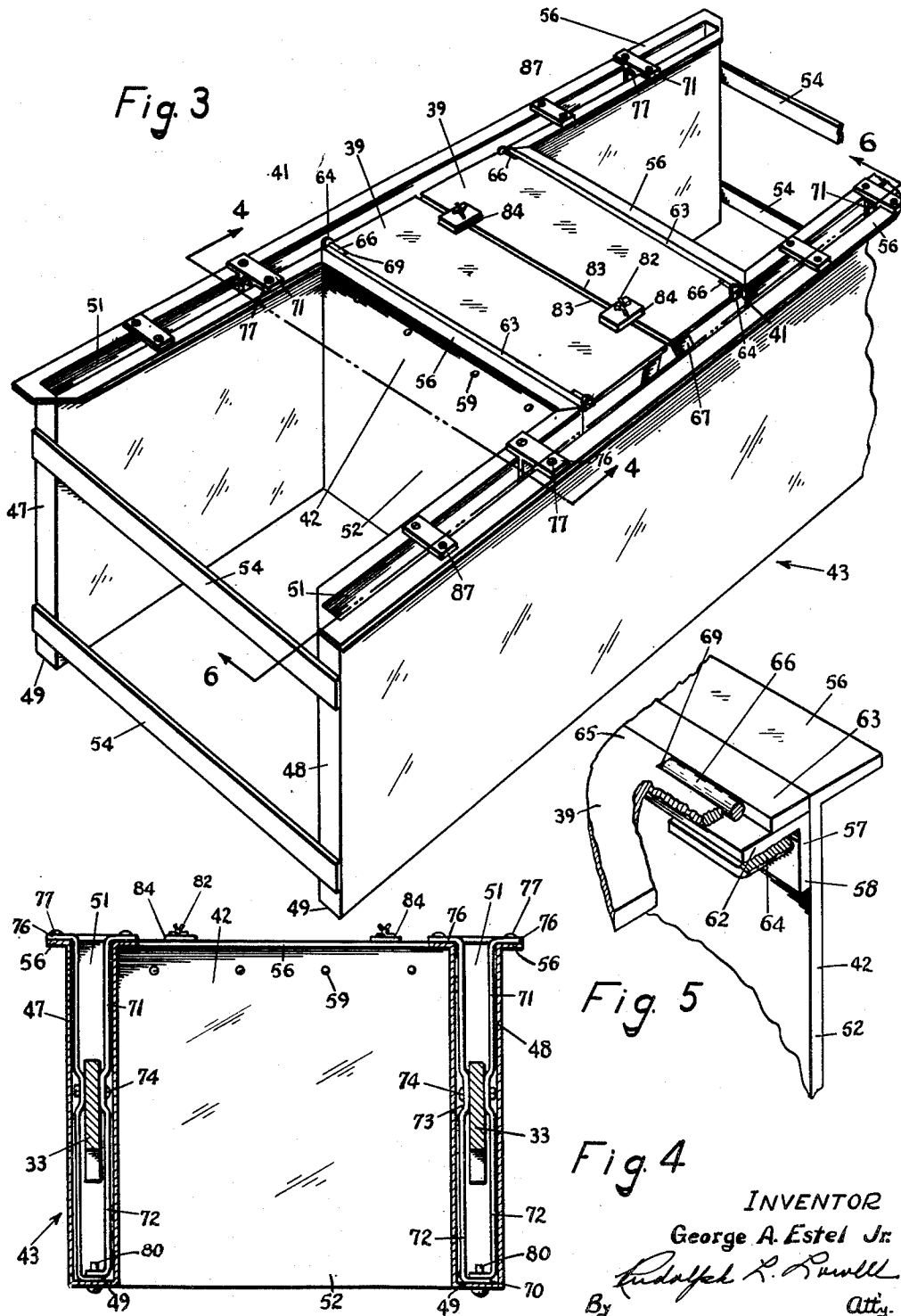
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VEHICLE LIFT

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UNITED STATES PATENT OFFICE

2,683,902

VEHICLE LIFT

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Application March 16, 1950, Serial No. 149,970

1 Claim. (Cl. 20—0.8)

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This invention relates generally to vehicle hoists of pit-mounted type and in particular to a pit form for a hoist of such type and a method for installing the pit form.

In hoists of pit-mounted type it is a common practice to ship the pit forms in a knocked down condition, assemble the pit forms on the job, and then installed the pit form relative to a previously ground imbedded cylinder, prior to the assembly of the hoist superstructure on the lift member or piston operatively associated with the cylinder. By virtue of the assembly requirements for the pit form and its installation relative to, but independent of, the lift member, there is not only an appreciable loss of time and effort, but considerable inconvenience is encountered in moving the pit form to a proper position due to its weight and bulk.

An object of this invention is to provide an improved vehicle hoist.

Yet another object of this invention is to provide an improved method for installing the pit form of a pit-mounted vehicle hoist.

Still a further object of this invention is to provide an improved pit form for a vehicle hoist.

A further object of this invention is to provide a vehicle hoist of pit-mounted type in which a pit form and the lift superstructure are assembled as a unit such that the pit form constitutes a crate for shipping the superstructure, and the superstructure a base for carrying the pit form on a lift member for adjustable movement of the pit form to an installed position in the hoist.

A feature of this invention is found in the provision of a pit-mounted vehicle hoist in which the superstructure for the hoist lift member is secured by clip members in a predetermined relation within a preassembled pit form. After the lift member and its associated cylinder have been installed, the superstructure, with the form thereon, is permanently mounted on the lift member. As a result of such mounting, the lift member functions as an adjustable support to permit adjustable movement of the pit form both vertically and horizontally to a position flush with the floor surface and centered relative to the hoist, with a final adjustment of the pit form being made before the concrete poured about the form has taken a permanent set.

Further objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawing, in which:

Fig. 1 is a perspective view of a two-post hoist of pit-mounted type embodying the pit form of

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this invention, with the hoist being illustrated in an elevated position therefor;

Fig. 2 is a longitudinal sectional view of the hoist in Fig. 1 shown in a lowered position therefor;

Fig. 3 is a perspective view of the pit form for the rear post of the hoist in Fig. 1, with the superstructure for the rear hoist assembled therein for shipping and installation of the assembly as a unit;

Fig. 4 is a sectional view taken on the line 4—4 in Fig. 3;

Fig. 5 is a fragmentary perspective view of the pit cover means for the rear hoist; with certain parts broken away;

Fig. 6 is a sectional view as seen on the line 6—6 in Fig. 3;

Fig. 7 is a longitudinal sectional view of the pit form for the front hoist showing the front hoist superstructure assembled therein for shipment and installation of the assembly as a unit;

Fig. 8 is a transverse sectional view taken along the line 8—8 in Fig. 7;

Fig. 9 is a perspective view of a clip or holding member embodied in the assembly shown in Figs. 7 and 8;

Fig. 10 is a perspective view of a clip or holding member embodied in the assembly shown in Figs. 3, 4 and 6; and

Fig. 11 is an enlarged foreshortened detail perspective view of a hinge assembly forming part of the pit cover unit for the front hoist.

With reference to the drawings, there is shown in Figs. 1 and 2 an automobile hoist of two-post type including front and rear hoists, with the front hoist having a ground embedded cylinder 10 operatively associated with a piston or lifting member 11, and the rear hoist including a cylinder 12 and an associated piston 13.

The front hoist is located in a pit 14 formed in a floor surface, indicated generally at 16, and includes a superstructure having a saddle 17 of a substantially U-shape secured, as by bolts 15, to the top of the piston 11 and having front axle-engaging members 18 at its opposite ends. The opening at the top of the pit 14 is of a size and shape such that the saddle member 17, at the lower-most limit of travel of the piston 11, is received within the pit below the surface of the floor 16. With the saddle 17 thus located within the pit 14, the pit opening is closed by a pair of hinged cover plates 21 which are movable upwardly and away from each other to their open positions, shown in Fig. 1, and downwardly to-

ward each other to supported positions on upright standards 26 located within the front pit 14 (Fig. 2).

When the piston 11 is initially raised, the cover plates 21 are pushed to their open positions by the saddle member 17. On a continued raising of the piston 11, the inner adjacent sides 27 of the cover plates 21 rest against the saddle member 17 and piston member 11 so as to be upwardly inclined toward each other, as shown in Fig. 1. This relative position of the cover plates 21 is maintained until the saddle member 17 is lowered into the pit 14, at which time the plates 21 follow the saddle member to their closed position. The upright standards 26 are arranged at opposite sides of the piston 11 and are loosely received within elongated openings 29 formed in the saddle member 17. It is seen, therefore, that the front hoist at its lower limit of travel is located entirely within the pit 14, the opening of which is closed by the plates 21 to provide a floor surface over the pit continuous or flush with the floor 16, as shown in Fig. 2.

The rear hoist is mounted in a floor pit 31 (Figs. 1 and 2) and includes a super structure having a transversely extended beam member 32 with a base plate 30 at its central portion secured to the top of the piston 13. Each end of the beam 32 extends through a flat upright longitudinally extended supporting member 33. The ends of the beam 32 are fixed to a corresponding member 33 by welding, as indicated at 34, so as to be substantially flush with the outer side surface of such member.

A rear axle-engaging block 36 is movably carried on the top edge of each upright supporting member 33 for movement longitudinally thereof to an axle-engaging position. The top edge of an axle-engaging block 36 is formed with an axle-receiving recess 37 and stops 38 at the opposite ends of each member 33 limits the travel of a corresponding block 36.

The opening of the rear pit 31 is of a size and shape such that when the piston 13 is at its lower most limit of travel (Fig. 2) the rear axle supporting or superstructure is receivable therein at a position below the level of the floor 16. The pit 31, when the rear hoist is in a lowered position, is closed by means including a pair of hinged cover plates 39 which are hinged at 41 to the opposite wall members 42 of a rear hoist pit form designated generally at 43. When the piston 13 is initially raised, the cover plates 39 are moved to their open positions, shown in Fig. 1, by the beam member 32. On a continued raising of the piston 13, the inner adjacent sides 44 of the cover plates 39 rest against the piston 13 so as to be upwardly inclined toward each other, as shown in Fig. 1.

The pistons 11 and 13 are operated in a usual manner by the admission of oil under pressure to the cylinders 10 and 12. Pressure on the oil is maintained by compressed air, the admission and release of which is controlled by an air valve unit 46 (Fig. 1), with the admission and release of oil under pressure to the cylinders 10 and 12 being controlled by oil valves 50 and 53, respectively.

The rear pit form 43 (Fig. 3) is of a substantially H-shape and includes a pair of longitudinally extended side boxes or forms 47 and 48 having closed bottom sides 49 and elongated top openings 51. A transverse box or form section 52, connected intermediate the ends of the side forms 47 and 48, has its ends open to the side

forms 47 and 48 and its lower side 45 (Fig. 6) open at the bottom of the form 43. As best appears in Fig. 4, the openings 51 are of a width to receive the upright plate members 33 in a clearance relation therein. The opposite ends of the side forms 47 and 48 are connected together by brace straps 54 (Fig. 3) and the top edge of the pit form 43 is reinforced by a continuous marginal laterally extended flange 56. The top openings 51 in the side forms 47 and 48 are of a relatively narrow width and are left uncovered at all times. The pit opening 31, which is defined by the transverse form section 52, is closed by the cover plates 39.

With reference to Figs. 1, 3 and 5, it is seen that each cover plate 39 forms part of a unit cover assembly which includes a supporting member 57, of an angle iron construction, having a vertical leg 58 positioned within the transverse form section 52 and detachably secured as by bolts 59 to the side walls 42 of the form section 52. Welded to the top side of the horizontal leg 62 of the supporting member 57, is a spacer bar 63 of a thickness corresponding substantially to the thickness of the cover plate 39, and extending over the full length of the supporting member 57. Welded to the bottom side and at opposite ends of the supporting member 57 are a pair of bracket supports 64 which constitute bearings for pivotally supporting pins 66 secured to and projected longitudinally outwardly from the opposite ends of the cover plate 39. With reference to Fig. 3, it is seen that the brackets 64 project only a slight distance upwardly from the cover member 39 and that the pins 66 are received within cut-away portions 69 formed in the cover plates 39, so as to present a substantially unobstructed surface when the cover plates 39 are closed.

By virtue of this assembly, the outer sides 65, of the cover plates 39, in a closed position of the cover plates, (Figs. 5 and 6) rest on the support members 57 so as to be substantially flush with the level of the floor 16, it being understood that a support member 57 is secured on a side wall 42 of the form section 52 such that a spacer bar 63 is in the plane of the marginal rim 56. The cover plates 39, in a closed position, are further supported on angle rests 67, located within the pit 31 (Figs. 1 and 2) with their upper sections 68 extended horizontally and inwardly from the opposite side walls 42 of the form section 52.

In the assembly and removal of a cover plate assembly, therefore, it is only necessary to remove the bolts 59 whereby a support member 57 and a corresponding cover plate 39 are handled as a unit. Further, the location of the pivot pins 66 substantially within the plane of the cover plates 39 prevents any accumulation of dirt, grease or the like about the pins which might interfere with a free pivoted action of the cover plates 39.

In the shipping of the hoist, the rear pit form 43, which is of a sheet metal construction, constitutes a crate for the rear hoist superstructure which includes the transverse beam 32 and the upright plate members 33. For shipping purposes, the opposite ends of the upright beam members 33 are provided with supporting brackets 71 of a generally rectangular shape and of a length (Figs. 4, 6 and 10) corresponding substantially to the depth or height of a form side section 47 and 48 and of a width to be received within such side sections. The side members 72 of a supporting bracket 71 are indented intermediate

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their ends, as indicated at 73, so that such indented portions 73 are spaced a distance apart corresponding substantially to the thickness of a plate member 33. The brackets 71 are secured to the plate members 33 by bolts 74 extended through the indented portions 73 and the plate members 33. As shown in Fig. 6, an axle-engaging block 36 is secured in a fixed position on a corresponding plate member 33 by a usual steel band 78.

With the brackets 71 and axle blocks 36 thus secured to the plate members 33, the rear hoist superstructure is placed within the pit form 42, with the plate members 33 within the side form sections 47 and 48, and the transverse beam member 32 within the transverse form section 52. When thus received within the pit form 43, the lower end 70 of each bracket 71 rests against the bottom side 49 of a form section 47 and 48 concurrently with the resting, on the marginal flange 56, of oppositely extended lugs 76 formed at the upper ends of the bracket side members 72. Bolts 77 extended through the lugs 76 and the adjacent portions of the marginal flange 56 secure the upper end of a bracket 71 to the pit form 43. The lower end 70 of a bracket 71 is held against movement by a rivet or pin 80 extended through and secured to the bottom 49 of a form side section 47 and 48 for reception within a hole 75 formed in the lower end 70 of a bracket 71.

It is seen, therefore, that the rear hoist superstructure is supported within the pit form 43 at a position determined by the bolt connections 74 of the brackets 71 with the plate members 33. This position of the superstructure corresponds to a lowered position of the rear hoist within the pit 31 for a purpose to appear later.

The cover plates 39 are retained in a closed position (Fig. 6) by extending pieces of wire 81 in a looped fashion about the transverse beam 32 and then extending the free ends 82 of the wire between the adjacent inner sides 44 of the cover plates 39 and through a block member 84 positioned on the top sides of the cover plates. By twisting together the free ends 82 of the wires 81 above the block members 84, the cover plates 39 are positively clamped against opening movement.

Thus, as shown in Fig. 3, the rear hoist superstructure is completely encased or boxed within the pit form 43, with the connecting braces 54 constituting hand grips for facilitating the handling of the complete assembly. To insure the side walls of the side form sections 47 and 48 against being jammed during shipping clip members such as 87 may be secured to portions of the marginal flange 56 arranged at opposite sides of a form section 47 and 48.

In the installation of the hoist, the cylinder 12 and its piston 13 is embedded within the ground and connected with the oil control system in a usual manner. On completion of this installation the wires 81 and blocks 84 are removed to permit opening of the doors 39 to facilitate bolting the base plate 30 of the superstructure directly to the top side of the piston 13, whereby the piston 13 constitutes an adjustable support permitting rotational horizontal movement and up and down movement of the superstructure and form 43 assembly, illustrated in Figs. 3, 4 and 6, as a unit. By virtue of this adjustment, the pit form 43 is capable of being lowered to a position at which the marginal flange 56 is flush with the floor surface 16 and with the rotational movement of the piston providing for the alignment of the pit form

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43 longitudinally and transversely of the hoist to a proper centered position.

With the pit form 43 in such centered position, concrete is poured about the form. Before the concrete has become set, namely, while it is still soft, the alignment of the pit form 43 is finally checked to insure its proper installation. On hardening of the concrete, the clips 87 and bolts 77 are removed so that on elevation of the piston 13, the superstructure is raised from the pit form 43. In this raised position of the superstructure, the steel tapes 78 are removed from the axle-engaging blocks 36 and the brackets 71 from the plate members 33 whereby the rear hoist is ready for use.

In a manner somewhat similar to the crating and installation, above described, for the superstructure and pit form 43 of the rear hoist, a front pit form 23, which defines the front pit 14, and the saddle 17 are relatively constructed for assembly as a unit for shipping and installation purposes. The pit form 23 is of a sheet metal construction and of a rectangular shape having an open top and an open lower end 104 (Figs. 7 and 8). For shipping the saddle or front superstructure 17 and front pit form 23, transverse brackets 91 (Figs. 7, 8 and 9) of a substantially U-shape are secured as by bolts 92 to the under side of the axle-engaging portions 18.

Each front cover plate 21 forms part of a unit cover assembly (Fig. 11) which includes a supporting member 95 of an angle iron construction having on the top of its horizontal leg 97 a spacer bar 98 of a thickness substantially equal to the thickness of a cover plate 21, and of a width less than the length of the horizontal leg 97 so that the outer side 99 of a cover plate 21 is in a supported position on the free end of the leg 97. The supporting member 96 and the spacer bar 98 extend the full length of the pit opening 14, with the opposite ends of the supporting member 96 being provided with upright bearing brackets 101 which are secured, as by welding, to the underside of the horizontal leg 97. Pivot pins 102 positioned longitudinally of and projected outwardly from the opposite ends of a cover plate 21 are received within the bearing brackets 101, whereby to pivotally support a cover plate 21 for pivotal movement relative to the supporting member 96, similar to the pivoted support of a rear cover plate 39 on its corresponding angle support 57.

The supporting member 96 is detachably connected as by bolts 103 (Figs. 7, 8 and 9) to the side walls 25 of the pit form 23 so as to be located within the pit form at a position such that the spacer bar 98 and a cover plate 21, in a closed position therefor, are substantially flush or level with the floor surface 16.

A marginal flange 106 extends laterally outwardly from the side walls 25 of the pit form 23 in substantially the plane of the spacer bar 98.

With the supporting brackets 91 attached to the saddle 17, as previously described, the saddle 17 is positioned within the pit form 23 and certain of the bolts 103 for securing the supporting members 96 to the side walls 25 are extended through slots 107 formed in the upright legs 105 of the brackets 91 (Figs. 7, 8 and 9). The legs 105 are of a length relative to the construction of the saddle 17 and the location of the bolts 103 so as to define a position of the saddle 17 within the pit form 23 corresponding to a lowered position of the piston 11 when the saddle 17 is mounted thereon. Further, the length of a sup-

porting bracket 91 is equal to the width of the pit opening 14 so that the location of the bolt hole 108 centrally of the base portion 109 of the bracket 91, and the location of the bolt opening (not shown) centrally of a saddle portion 18 centers the saddle 17 transversely of the front pit form 23.

The cover plates 21, in their closed positions, have their outer sides 99 resting on the supporting members 96, and their inner adjacent ends 27 (Figs. 2 and 8) resting on the upper ends of the upright tubular supports or standards 26. The lower ends of the standards 26 are supported on transverse brace members 113 connected between the lower ends of the pit form side walls 25. To lock the cover plates 21 in closed positions therefor, looped wires 114 are positioned about the saddle 17 and the free ends 117 of the wires 114 are inserted between the inner adjacent sides 27 of the cover plates 21 and through block members 118 supported on the top sides of the cover plates 21. By twisting the wire ends 117 against the top sides of the blocks 118, the cover plates 21 are clamped in their closed positions.

Where front wheel aligning plates, such as those indicated at 121 in Figs. 1 and 7, are used, these plates may also be shipped within the form 23 by suitably securing them to the saddle member 17 at a position between the upright standards 26 in a manner which will be clearly apparent from a consideration of Fig. 7.

In the installation of the front hoist, the cylinder 10 and its associated piston 11 are embedded within the ground and the cylinder is connected with the hoist control system in a usual manner. On elevation of the piston 11, the saddle 17, while in its shipping position within the form 23, is secured directly to the top end of the piston 11 by the bolts 15 (Fig. 1). To facilitate this assembly of the saddle 17 with the piston 11, the wires 114 are first removed to permit opening of the cover plates 21. As a result, the complete assembly of the saddle 17 and pit form 23 is adjustably supported on the piston 11 for rotational adjustment in a horizontal plane and for up and down movement. With the piston 11 moved to a lowered position therefor, the pit form 23 is horizontally adjusted to a hoist centered position and vertically adjusted so that the flanges 106 are substantially flush or level with the floor 16.

After concrete has been poured about the form 23, and before such concrete has become hardened or set, the form 23 is checked for final alignment. The supporting brackets 91 are then disconnected from both the saddle 17 and the pit form 23, whereby the front hoist is ready for use.

In the installation of the hoist, it is to be un-

derstood that the front form 23 and rear form 43 are concurrently installed and relatively aligned to hoist centered positions.

From a consideration of the above description, it is seen that the invention provides an improved pit form, for a vehicle hoist of pit type, which constitutes a shipping crate for a corresponding hoist superstructure, with such superstructure in conjunction with a lift member, constituting an adjustable supporting means for moving the pit form to a properly aligned position in the installation of the hoist. As a result of this co-operating function between the pit form and its associated superstructure, there is effected a saving in time and money both in the handling and shipping of a form and superstructure assembly, and in the installing of such assembly in a hoist installation.

Although the invention has been described with respect to a preferred embodiment thereof, it is to be understood that it is not to be so limited since changes can be made therein which are within the full intended scope of this invention, as defined by the appended claims.

I claim:

The method of installing a vehicle lift having a lift cylinder embedded in the ground and wherein a lift piston for the cylinder carries a super structure which, when the lift piston is in a lowered position, is within a pit below the level of the floor surface, which consists in embedding the cylinder and piston assembly in the ground at a position below the level of the floor surface equal to substantially the height of the pit, releasably securing said super structure in a centered position within a pit form prior to the attachment of the super structure to the lift piston, attaching said super structure, with the pit form secured thereto, to the lift piston, operating the lift piston to locate the top side of the pit form at substantially the level of the floor surface, rotating said piston to move the pit form and super structure as a unit to an aligned position relative to the longitudinal and transverse axes of the vehicle lift, pouring concrete about the pit form to embed the same in said aligned position, and then releasing the super structure for movement relative to the embedded pit form.

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