ABSTRACT: Load-supporting platform provided with foldable corner posts, connected both when folded and upstanding, at the same relative positions, to the spreader bars of a platform-lifting crane sling.
LIFTING PLATFORMS FOR SUPPORTING LOADS

1. FIELD OF THE INVENTION

This invention relates to lifting platforms for supporting loads during the loading or unloading of the platform into and out of a ship or land vehicle such as an open road or rail truck, as well as for supporting the loads during their transportation within the ship or land vehicle, which platform is of the kind herein called the "kind specified" comprising a load-supporting base of square or rectangular configuration provided at each corner thereof, with a post hingeable relative to the base between an out of use position in which the post extends alongside the base parallel or substantially parallel thereto, and an operative position in which each post is upstanding and, with the platform carrying the load, adapted at the upper end thereof, to engage and support adjacent the corner thereof, the base of a further similar platform so as to permit of a number of loaded platforms being stacked one upon the other, each post at its free or upper end being connectable to one of the connecting means, e.g. lifting hooks of a crane sling, for the purpose of transferring the loaded platform into and out of the hold or in and out of a land vehicle.

2. Description of the Prior Art

With lifting platforms of the kind specified, it is most desirable in order to minimize lateral swinging of the platform during lifting and lowering by the crane, for the crane sling hooks or the equivalent which are engageable with each of the corner posts to be interconnected by spreader bars so that the crane sling embodies a substantially horizontally extending square or rectangular frame of dimensions similar to the peripheral dimensions of the platform base.

Such an arrangement has proved most satisfactory in lifting and lowering the loaded platforms, but although such an arrangement has been in use for some time now, it has not hitherto been possible for the crane sling hooks or the equivalent at the corners of the spreader crane to be engaged with the platform for the purpose of lifting and lowering this when the corner posts are in their out-of-use position.

This is because when the posts are in their out-of-use position they are folded towards the center of the side of the platform, alongside which they lie when in the out-of-use position so that the relative spacing between the free end of the posts is substantially less in a direction along such platform sides, than is the case when the posts are upstanding.

Accordingly, for the purpose of lifting the platforms with the posts in the out-of-use position, it has hitherto been the practice to remove the spreader bars from the sling and to engage the sling hooks or other connecting means of the crane sling with lifting rings or the like provided at the periphery of the platform base at positions spaced away from the corners thereof.

Insofar as with such an arrangement it is necessary specially to remove the spreader bars from the sling when the platform is to be raised with the posts in the out-of-use position and it is necessary to reposition the spreader bars when the platform with the posts in the operative position is again to be raised or lowered, this existing arrangement is a very inconvenient one, and the object of the present invention is to provide an improved construction by which the foregoing disadvantage is avoided.

SUMMARY OF THE INVENTION

According to the present invention the corner posts adjacent their respective hinge connection to the corners of the platform base are each provided with a crane-sling-connecting means engaging portion, each of which engaging portions of the corner posts is, when the posts are in their out-of-use position, vertically aligned with the positions occupied by the crane-sling-connecting means engaging parts at the free ends of the posts when these are upstanding and in their operative positions.

Thus, the hooks or the equivalent at the ends of the spreader bars of the crane sling can be engaged with equal facility with the lifting platform to raise and lower this with the posts in either of their two positions, and it is accordingly unnecessary at any time to remove the spreader bars of the sling for this purpose.

Preferably, the sling hook or equivalent engaging portions of the posts provided adjacent the hinges thereof are disposed at the opposite side of the corresponding hinge axis to the free ends of the posts so that when the posts are displaced into their upstanding position these hook or equivalent engaging portions swing downwardly and inwardly into recesses provided at the corners of the platform base adjacent to but below the level of the adjacent hinge axis.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated in the accompanying drawings, wherein:

FIG. 1 is a perspective view of one form of lifting platform provided with corner posts in accordance with this invention, the corner posts being depicted in their upstanding operative positions, with part of one of the sides of the platform being broken away.

FIG. 2 is a view similar to FIG. 1, but showing all of the corner posts in their out-of-use position.

FIG. 3 is a side elevation to an enlarged scale of part of the construction shown in FIG. 2, illustrating more clearly the positions which the corner posts occupy when in both their operative and their out-of-use positions.

FIG. 4 is a side elevation to an enlarged scale of part of the construction shown in FIG. 2.

FIG. 5 is a sectional view of a detail on the line 5-5 of FIG. 3, showing one of three possible positions of one of the side doors of the construction illustrated in FIG. 1.

FIGS. 6 and 7 are views similar to FIG. 5, but showing each one of the two other positions which may be occupied by the side doors.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, the lifting platform 9 comprises a base 10 of rectangular configuration as viewed in plan, having secured thereto at each of its corners, a post-supporting bracket 11 conventionally formed as a steel casting and shown most clearly in FIG. 3.

Each of these brackets is provided at the side 12 thereof nearest to the platform 10, with an upstanding hinge lug 13 which extends between a pair of horizontally spaced-apart hinge lugs 14, of which only one is illustrated, and which are provided at the lower end 15 of a corresponding corner post 16, the two sets of hinge lugs being connected by a hinge pin 17.

The upstanding hinge lug 13 with its associated hinge pin 17 is disposed at that side of the bracket 11 which is nearest to the base 10 to provide at the opposite side of the hinge lug 13, a space 18 which receives the lower end 15 of the adjacent corner post 16, with the latter in its upstanding operative position as depicted in FIG. 1.

As shown in FIG. 1, the post 16 is provided at its upper end with a load-engaging head 19 having a through hole 20 of slot-like configuration, with the major axis of cross section vertical considering the post upstanding, and each of these post holes 20 is adapted to receive one of the connecting means, namely the pins of shackles 21 provided one at each of the four corners of the spreader bars 22 of the crane sling 23. Alternatively the holes 20 can receive sling hooks provided in place of the shackles 21, so as in either case to effect lifting and lowering of the platform with the posts upstanding, that is to say, when the platform 9 is loaded.

In accordance with the present invention the posts 16 at their lower ends 15 are provided with through holes 24 for engaging with the aforementioned sling hooks or the pins of spreader-hook-engaging shackles 21, these holes 24 being
again of slotlike configuration, but with the major axis of cross section extending perpendicular to the length of the posts, so that the holes 24 are elongated in a vertical direction considering the posts 16 in their out-of-use position.

As will be seen by comparing the position of the holes 24 in relation to a vertical plane containing the hinge axis 17 and as will be seen by making the same comparison in FIG. 3 in respect of the holes 20, the holes 24 with the posts 16 in their out-of-use position are vertically aligned with the positions occupied by the holes 20 at the upper ends of the posts with the latter in their operative position.

Thus the holes 24 as provided at the lower ends of the corner posts 16 are just as equally engageable with the sling-spreader shackles 21 or the equivalent as is the case with the holes 20 at the upper ends of the corner posts with the consequent advantages already mentioned.

The foregoing result is ensured by the fact that the holes 24 are disposed at the side of the axis of hinge 17 which is furthest from the free ends of the posts 16 as will be apparent from FIG. 3, an arrangement which also facilitates the housing of the lower ends 15 of the posts within the recess 18, considering the posts upstanding, in which position the lower ends of the posts are vertically aligned with the portion 11a of bracket 11 which is furthest from the adjacent platform base 10.

The lower extremity of the bracket 11 is itself provided with through holes 25 also of slotlike configuration with their major axis of cross section vertical, and these are adapted to receive coupling pins not shown for connecting the same to the holes 20 provided at the upper ends of the upstanding posts of a further similar platform 9 therebeneath, so as to permit of a number of similar platforms 9 of the form depicted in FIGS. 1 and 2 of the drawings being connected together and lifted and lowered at one and the same time.

All of the holes 20, 24 and 25 are elongated in a vertical direction when in position for engaging with the sling hooks or equivalent to facilitate engagement and disengagement therewith in the known manner.

To assist in maintaining the posts 16 in their upstanding position depicted in FIG. 1, each of the four posts is provided with a detachable extensible stay 26, each stay as best shown in FIG. 4 being in the form of a tube provided at each end with a nut 27, the two nuts being of opposite hand, and engaging with a correspondingly threaded shank 26b of an eye 29, each eye having mounted therein a part-spherical bearing 30 of known form.

The bearing at one end of the stay 26 is connected permanently to pin 31, on the adjacent horizontal side member 10a of base 10. The eye 29 at the opposite end of stay 26 is adapted through its associated bearing 30 to engage detachably with a hook 32 (see FIG. 3) provided on the post 16 near the free end thereof, the arrangement ensuring that each post 16 is maintained truly vertical when in its operative position, as shown in FIG. 1. The adjustability in the overall length of the stay 26 provided by the two nuts 27, the threads of which are of opposite hand, enables the length of the stay to be varied slightly to take care of deflections of the base 10 under the weight of the supported load.

As shown in FIG. 4, when it is desired to swing the corner posts 16 into their out-of-use position, the stays 26 can be disengaged from the post hooks 32 and swung about their aforementioned pivots 31 into a position in which they lie alongside the adjacent base member 10a, on which they are supported by platelike brackets 33 extending outwardly from the base member 10a, and which, see FIG. 5, are formed with recesses 33a for receiving the so-disposed stays 26.

The platform 9 is provided along each of the four sides of the rectangular base 10, with hinged walls, which in the case of the two ends of the platform are provided by a reinforced metal sheet 34, extending between the two posts 16 at the corresponding end of the base 10, the arrangement being such that the so-formed end walls fold down with the posts, when these are disposed in their out-of-use position shown in FIG. 2.

The aforesaid walls at the sides of the rectangular base 10 are provided along each of the two sides by a pair of doors 35, each hinged to the adjacent base member 10a, each door being formed as a reinforced length of metal sheet, and being hinged to the base member 10a at a number of positions, as shown three positions spaced along the base member, so that each door is supported on three hinges.

Each of these hinges 36 is constructed as shown in FIGS. 5 to 7 of the drawings, in such a manner as to permit of each door 35 occupying a dependent platform-loading position, as shown in FIG. 5, an upstanding loading-containing position deicted in FIG. 6 and a collapsed position as shown in FIG. 7, to facilitate the stacking of a number of platforms one upon the other, as already described.

For this purpose, each hinge 36 comprises a bracket 37, secured to each of the two base members 10a, so as to project outwardly therefrom, the bracket being pivoted at 38 to one end of a two-armed lever 39, the opposite end of which lever is pivoted at 40 to a hinge lug 41 secured to the adjacent edge of the corresponding door 35, i.e. to the lower edge considering the door upstanding.

The hinge lug 41 is of L-shape, with one arm 42 being adapted to overlie the adjacent arm of lever 39, to which it is detachably connected by removable hinge pin 43, which is adapted to pass through the two-armed lever 39 at the junction 39a between the two arms.

With the removable hinge pin 43 in position, the hinge lug 41 is locked against pivotal movement relative to lever 39, and the door 35 can then only swing about pivot 38 between the dependent loading position depicted in FIG. 5 and the upstanding containing position depicted in FIGS. 1 and 6. When it is required to dispose each door 35 in the collapsed position, for the purpose of stacking the empty platforms, the hinge pin 43 is removed, thus permitting of the hinge lug 41 together with the door 35 swinging about pivot 40 relative to two-armed lever 39, thus bringing the now unconnected hinge lug arm 42 into an upstanding position as shown in FIG. 7, in which the door 35 lies horizontal on the upper side of the adjacent part of the platform base 10.

The side doors 35 are supported in their upstanding containing position depicted in FIG. 1, by sliding bolts 44, provided at each end of the free edge of each door, which bolts 44 engage with the corner post 16 and also with a center post 45, the lower end of which is a detachable fit in a socket 46 mounted on the adjacent base member 10a.

With platforms 9 as above described, it will be understood that when the corner posts 16 are in their upstanding position, as depicted in FIG. 1, these at their upper ends are adapted to support in the known manner the base of a further similar platform, which may be a loaded platform, with its own corner posts upstanding, as depicted in FIG. 1, or alternatively an empty platform, with its corner posts folded down, as depicted in FIG. 2. In the former case, the uppermost of the two platforms may through its upstanding corner posts, support a further platform thereon.

Also, with the corner posts in their collapsed or inoperative position, as depicted in FIG. 2, and the platform empty, a number of so-arranged platforms may be stacked one upon the other.

I claim:
1. A load lifting and supporting platform of the kind which is engageable with crane-sling-connection means, said platform comprising a load-supporting base of square or rectangular configuration, a post hingely connected at one end to each corner of the base for movement in relation thereto between an out-of-use position in which each post extends substantially horizontally alongside the base and an upstanding load-supporting position, each of said posts having at each end thereof an opening formed therein for receiving crane-sling-connection means, where the opening at the top is vertically positioned and the opening adjacent said hinge end is horizontally positioned when said post is in said upstanding load-supporting position, each of said openings extending
within the post in a direction transverse to the length of the post with the edges of each opening lying in a plane transverse to the axis of hinging of the associated post relative to the supporting base with the opening at the hinge end of each post so offset in a horizontal direction in relation to a vertical plane containing the axis of hinging that when the post is hinged into its horizontal out-of-use position, said post opening at the hinge end thereof is vertically aligned in respect of the position occupied by the opening at the opposite i.e. upper end of the post considering the latter in its upstanding position.

2. A platform according to claim 1 wherein the hinge axis of each post is disposed at a horizontal level above that of the opening in the hinge end of the post when the latter is in its upstanding position.

3. A platform according to claim 1 wherein the base is provided on each of two opposite sides thereof with a hinged door, connected to the base through hinging means arranged to permit of the door occupying any one of three different positions, namely a loading position in which the door depends from the hinge and associated base, an upstanding load-containing position and an inoperative position in which the door lies on the upper face of the platform base, each of said door-hinging means comprising a two-armed lever, one end of which is fulcrummed to the base, and the opposite end of which is fulcrummed to a hinge lug connected to the door, the hinge lug having connected thereto an arm, the free end of which is adapted to be removably locked to the two-armed lever intermediate opposite ends thereof, so as to permit of the door being swung together with the two-armed lever between its dependent and upstanding position, and with the hinge lug arm unlocked from the two-armed lever of the hinge lug and door being swung relative to the lever into a position in which the door lies horizontally on the upper side of the platform base.