of the device during installation. A cavity of a specific geometry on the pier shaft is also required to accommodate the device to be installed.

[0005] Thus, there is a need to provide a device and method for turning an elevated structure that seek to address some of the above problems or provide a useful alternative.

SUMMARY

[0006] According to a first aspect of the present invention, there is provided a device for turning an elevated structure about a support structure, the device comprising:

an upper plate member configured to be attached to the elevated heavy-load structure; and

a lower plate member configured to be attached to the support structure,

wherein the upper plate member is rotatable with respect to the lower plate member for turning the elevated heavy-load structure about the support structure; and

wherein the lower plate member comprises a raised central portion extending from an upper surface, the central portion configured to abut a lower surface of the upper plate member such that a contact area between the upper plate member and the lower plate member is equal to a fraction of a surface area of the lower plate member.

[0007]

[0008] The lower plate member further may comprise a flat lower surface, the lower surface having a recessed central portion opposite the raised central portion.

[0009] The lower plate member may further comprise a raised peripheral portion extending from the upper surface, the raised peripheral portion configured to abut the lower surface of the upper plate member.

[0010] The lower surface of the upper plate member and the upper surface of the lower plate member excluding the raised central and peripheral portions may define a fluid-tight chamber there between, the chamber configured to receive a hydraulic fluid.

[0011] The hydraulic fluid may comprise a lubricating oil.

[0012] A pressure of the hydraulic fluid may be determined based on the weight of the elevated heavy-load structure such that the device hydraulically supports the elevated heavy-load structure.

[0013] The upper plate member may comprise a fluid inlet for introducing the hydraulic fluid into the chamber, and a fluid outlet for removing the hydraulic fluid from the chamber.

[0014] The lower plate member may further comprise a plurality of attachment brackets extending outwardly from a peripheral wall of the lower plate member, for setting ~~the~~ a horizontal position and attaching the lower plate member to the support structure.

[0015] The support structure may comprise a pier shaft and the elevated heavy-load structure comprises a pier head.

[0016] According to a second aspect of the present invention, there is provided a method of constructing an elevated heavy-load structure, the method comprising the steps of:

forming the elevated heavy-load structure at a first position relative to a support structure, comprising securing the lower plate member of the device as defined in the first aspect to the support structure and securing the upper plate member of the device to the elevated heavy-load structure, the upper plate member being received by the lower plate member;

turning the elevated heavy-load structure about the support structure from the first position to a second position, wherein turning the elevated heavy-load structure comprises providing a hydraulic fluid through a fluid inlet disposed in the upper plate member into a chamber of the device and rotating the upper plate member with respect to the lower plate member;

removing the hydraulic fluid from the chamber through a fluid outlet disposed in the upper plate member of the device at the second position; and

securing the elevated heavy-load structure to the support structure at the second position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Embodiments of the invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[0018] Figure 1a is a top perspective view of a device for turning an elevated structure or a heavy load before assembly according to an example embodiment.

[0019] Figure 1b is a bottom perspective view of the device of Figure 1a.

[0020] Figure 1c is a cross-sectional view of the device of Figure 1a.

CLAIMS

1. A device for turning an elevated heavy-load structure about a support structure, the device comprising:

an upper plate member configured to be attached to the elevated heavy-load structure; and

a lower plate member configured to be attached to the support structure,

wherein the upper plate member is rotatable with respect to the lower plate member for turning the elevated heavy-load structure about the support structure; and

wherein the lower plate member comprises a raised central portion extending from an upper surface, the central portion configured to abut a lower surface of the upper plate member such that a contact area between the upper plate member and the lower plate member is equal to a fraction of a surface area of the lower plate member.

2. The device as claimed in claim 1, wherein the lower plate member further comprises a flat lower surface, the lower surface having a recessed central portion opposite the raised central portion.

3. The device as claimed in claim 1 or 2, wherein the lower plate member further comprises a raised peripheral portion extending from the upper surface, the raised peripheral portion configured to abut the lower surface of the upper plate member.

4. The device as claimed in claim 3, wherein the lower surface of the upper plate member and the upper surface of the lower plate member excluding the raised central and peripheral portions define a fluid-tight chamber there between, the chamber configured to receive a hydraulic fluid.

5. The device as claimed in claim 4, wherein the hydraulic fluid comprises a lubricating oil.

6. The device as claimed in claim 4 or 5, wherein a pressure of the hydraulic fluid is determined based on the weight of the elevated heavy-load structure such that the device hydraulically supports the elevated heavy-load structure.

7. The device as claimed in any one of claims 4 to 6, wherein the upper plate member comprises a fluid inlet for introducing the hydraulic fluid into the chamber, and a fluid outlet for removing the hydraulic fluid from the chamber.

8. The device as claimed in any one of the preceding claims, wherein the lower plate member further comprises a plurality of attachment brackets extending outwardly from a peripheral wall of the lower plate member, for setting ~~the~~ a horizontal position and attaching the lower plate member to the support structure.

9. The device as claimed in any one of the preceding claims, wherein the support structure comprises a pier shaft and the elevated heavy-load structure comprises a pier head.

10. The device as claimed in any one of the preceding claims, wherein the upper plate member further comprises a cross-shaped rib having a plurality of bolt holes disposed thereon, and wherein the upper plate member is configured to be attached to the elevated heavy-load structure using bolts installed into said bolt holes.

11. A method of constructing an elevated heavy-load structure, the method comprising the steps of:

forming the elevated heavy-load structure at a first position relative to a support structure, comprising securing the lower plate member of the device as claimed in any one of claims 1 to 10 to the support structure and securing the upper plate member of the device to the elevated heavy-load structure, the upper plate member being received by the lower plate member;

turning the elevated heavy-load structure about the support structure from the first position to a second position, wherein turning the elevated heavy-load structure comprises providing a hydraulic fluid through a fluid inlet disposed in the upper plate member into a chamber of the device and rotating the upper plate member with respect to the lower plate member;

removing the hydraulic fluid from the chamber through a fluid outlet disposed in the upper plate member of the device at the second position; and

securing the elevated heavy-load structure to the support structure at the second position.