distribution. Preferably there is a single winch for the two reeving systems such that the two reeving systems in fact form a single combined telescopic system provided at both sides of the base boom section.

There is also disclosed a locking system for an extendable lattice type crane boom, including the features of claim 8. Such a locking system can provide a solid locking of an extendable boom in at least an extended position, and is relatively easy and quick in operation. An extendable lattice type crane boom can also comprise a plurality of telescopic boom sections, wherein each telescopic boom section is lockable with a contiguous telescopic boom section via such a locking system. In this way, a still larger and/or compacter extendable crane boom can be provided.

According to an embodiment of the disclosure, a crane is disclosed according to the features of claims 10-12. The crane comprises an extendable lattice type crane boom as described above. Said lattice type boom is movable between a transit position, in which said lattice type boom is in a substantially retracted and substantially horizontal position, and a working position, in which the lattice type boom is extended. The crane also comprises a crane base to which said extendable lattice type boom is pivotably connected, such that the crane boom can be rotated around a substantially horizontal axis between said transit position and said working position. The crane base can optionally also be made rotatable around a substantially vertical axis. The crane further comprises a boom hoisting system arranged to rotate the extendable boom between said transit position and said working position, and a load hoisting system configured to hoist a load. The boom hoisting system can preferably be connected to a distal end of the base boom section as well as to a distal end of the telescopic boom section, which can provide a relatively stable, well-balanced and reliable crane. Alternatively, the boom hoisting system may also be connected to one of a distal end of the base boom section and a distal end of the telescopic boom section. The boom hoisting system may also be

In a preferred embodiment of the crane, the crane base can be mountable around a leg of a jack up platform. Such a crane can provide a relatively compact yet efficient crane, even in a harsh off-shore environment. The crane base may also be mountable on a standard pedestal with a slewing bearing arrangement. However, providing the crane base around a leg of the jack-up platform provides for a space efficient solution for the use of the space on a deck of the jack-up platform.

According to a further embodiment of the disclosure, there is disclosed in claims 13-18 a method for operating a crane including an extendable lattice type crane boom, providing one or more of the above-mentioned advantages.

According to a further embodiment of the disclosure, the features of claims 19-20 disclose a jack up platform comprising a crane according to an embodiment, providing one or more of the above-mentioned advantages.

According to an alternative embodiment of the disclosure, an extendable or telescopic boom with a base boom section and at least one telescopic boom section is proposed. As previously described, the sections are of a lattice type construction with a square, rectangular or possibly triangular cross section, with longitudinally extending chords in each corner of the cross-section which are connected to each other with trusses. The telescopic section has smaller cross-sectional dimensions in comparison with the base boom section, which base boom section at least partly encloses the inserted part of the telescopic boom section. The telescopic section can be moved relative to the base boom section in order to extend or shorten the boom. The telescopic boom section is adjustable with respect to the base boom section between a retracted position, in which the telescopic boom section is substantially inside of the base boom section, and an extended position, in which the telescopic boom section is substantially outside of the base boom section. The telescopic boom section is preferably locked with

- releasing the aligning system to re-establish the contact between the guides between the telescopic boom section and the base boom section
- retracting the remaining locking pins
- lowering the telescoping system until the telescopic boom section reaches the retracted position
- insert the locking pins into the apertures arranged in the chords of the telescopic boom section which correspond with the retracted position of the telescopic boom section, if locking in a retracted position is provided. Advantageously, prior to retracting the locking pins, the locking pin to be retracted is first unloaded as to be able to retract the pin. For unloading the locking pin, the telescopic system can be operated to adjust the telescopic boom as to unload the said locking pin. This can be done for each locking pin to be retracted, or for a set of locking pins at the same time. Advantageously, the locking pins are retracted in reverse order as they were inserted.

In case the boom has multiple telescopic boom sections, the method can be repeated for each consecutive telescopic boom section.

In view of the above, according to a first aspect of the disclosure, there is provided an extendable lattice type crane boom for a crane, the boom comprising a lattice type base boom section and at least one lattice type telescopic boom section, wherein the at least one telescopic boom section is adjustable with respect to the base boom section between a retracted position, in which the telescopic boom section is inside of the base boom section, and an extended position, in which the telescopic boom section is at least partly outside of the base boom section, further comprising a locking system configured to lock the at least one telescopic boom section with respect to the base boom section in at least the extended position, wherein said locking system includes a plurality of pins, each pin being configured to extend, in at least the extended position of the boom, at least

partly through a corresponding pin receiving aperture provided in one of the base boom section and the at least one telescopic boom section, wherein the plurality of pins comprise at least one primary pin adapted to be received in a corresponding primary pin receiving aperture, and at least one secondary pin adapted to be received in a corresponding secondary pin receiving aperture, wherein the at least one primary pin receiving aperture is slotted or egg-shaped or droplet shaped such that a size of the at least one primary pin receiving aperture is larger than a cross-sectional dimension of a corresponding primary pin for engaging in the primary pin receiving aperture to allow movement of the primary pin in the corresponding primary pin receiving aperture.

According to another aspect of the disclosure, there is provided a locking system for an extendable lattice type crane boom as described herein, wherein said locking system is arranged to lock, at least in an extended position of the boom, a base boom section or a telescopic boom section of the extendable boom with respect to a contiguous telescopic boom section of the extendable boom, wherein said locking system includes a plurality of pins, each pin being configured to extend, in at least the extended position of the boom, at least partly through a corresponding pin receiving aperture of the locking system in the contiguous telescopic boom section, wherein the plurality of pins comprise at least one primary pin adapted to be received in a corresponding primary pin receiving aperture, and at least one secondary pin adapted to be received in a corresponding secondary pin receiving aperture, wherein the at least one primary pin receiving aperture is slotted or egg-shaped or droplet shaped such that a cross-section of the at least one primary pin receiving aperture is larger than a cross-section of the corresponding at least one primary pin to allow movement of the primary pin in the corresponding primary pin receiving aperture.

According to another aspect of the disclosure, there is provided a crane comprising an extendable lattice type crane boom as described herein, wherein said lattice type boom is movable between a transit position, in which said lattice type boom is in a substantially retracted and substantially horizontal position, and a working position, in which the lattice type boom is extendable; a crane base to which said extendable lattice type boom is pivotably connected; a boom hoisting system arranged to move the extendable boom between said transit position and said working position; a load hoisting system configured to hoist a load.

According to another aspect of the disclosure, there is provided a method of operating a crane including an extendable lattice type crane boom, preferably a boom as described herein, and preferably a crane as described herein, wherein the extendable lattice type boom comprises a lattice type base boom section and at least one lattice type telescopic boom section, the method comprising the steps of: operating a boom hoisting system to bring the extendable lattice type boom from a transit position to a working position; operating a telescopic system to adjust the at least one telescopic boom section with respect to the base boom section from a retracted position, in which the telescopic boom section is substantially inside of the base boom section, to an extended position, in which the telescopic boom section is substantially outside of the base boom section; inserting at least one primary pin least partly through a corresponding pin receiving aperture to substantially determine a position of the telescopic boom section with respect to the base boom section, wherein the primary pin receiving aperture is slotted or egg-shaped or droplet shaped to allow movement of the primary pin in the corresponding primary pin receiving aperture; adapting an angular position of the telescopic boom section with respect to the base boom section until a secondary pin receiving aperture corresponds with a secondary pin; inserting at least one secondary pin in a corresponding secondary pin receiving aperture.

According to yet another aspect of the disclosure, there is provided a jack up platform including a crane as described herein.

The disclosure will further be elucidated on the basis of exemplary embodiments given by way of non-limitative description and illustration. It is noted that the figures are only schematic representations of embodiments of the disclosure that are given by way of non-limiting example. Various modifications, variations, and alternatives are possible, as well as various combinations of the features described. The specifications, drawings and examples are, accordingly, to be regarded in an illustrative sense rather than in a restrictive sense. Embodiments according to the disclosure will, by way of non-limiting example be described in detail with reference to the accompanying drawings. In the drawings:

Claims

1. Extendable lattice type crane boom for a crane, the boom comprising a lattice type base boom section and at least one lattice type telescopic boom section, wherein the at least one telescopic boom section is adjustable with respect to the base boom section between a retracted position, in which the telescopic boom section is inside of the base boom section, and an extended position, in which the telescopic boom section is at least partly outside of the base boom section,
further comprising a locking system configured to lock the at least one telescopic boom section with respect to the base boom section in at least the extended position, wherein said locking system includes a plurality of pins, each pin being configured to extend, in at least the extended position of the boom, at least partly through a corresponding pin receiving aperture provided in one of the base boom section and the at least one telescopic boom section, wherein the plurality of pins comprise at least one primary pin adapted to be received in a corresponding primary pin receiving aperture, and at least one secondary pin adapted to be received in a corresponding secondary pin receiving aperture, wherein the at least one primary pin receiving aperture is slotted or egg-shaped or droplet shaped such that a size of the at least one primary pin receiving aperture is larger than a cross-sectional dimension of a corresponding primary pin for engaging in the primary pin receiving aperture to allow movement of the primary pin in the corresponding primary pin receiving aperture.

2. Extendable lattice type crane boom according to claim 1, wherein said locking system comprises a support structure from which the plurality of pins extend, optionally, wherein said support structure is provided at a distal end of the base boom section.

3. Extendable lattice type crane boom according to any of the preceding claims, wherein the corresponding pin receiving aperture is provided at a chord of the telescopic boom section, preferably at a proximal end of the telescopic boom section, more preferably of every chord of the telescopic boom section.

4. Extendable lattice type crane boom according to any of the preceding claims, wherein the locking system comprises a secondary set of pins and corresponding pin receiving apertures provided at a lower chord of the base boom section and of the telescopic boom section, wherein preferably at least one of the pin receiving apertures has a size which is larger than a cross-sectional dimension of the corresponding pin to be received.

5. Extendable lattice type crane boom according to any of the preceding claims, comprising a guiding system configured to guide a movement of the telescopic boom section along the base boom section, optionally, wherein said guiding system is provided on a chord of the base boom section and/or the telescopic boom section under an angle of substantially 45° with respect to an upper or a lower side of the boom.

6. Extendable lattice type crane boom according to any of the preceding claims, further comprising a measuring system configured to detect a position of the telescopic boom section with respect to the base boom section.

7. Extendable lattice type crane boom according to any of the preceding claims, further comprising a telescopic system arranged to adjust the at least one telescopic boom section between said retracted position and

said extended position, wherein said telescopic system comprises at least one reeving system, optionally, wherein the telescopic system comprises two reeving systems, each provided on an opposite side of the base boom section, preferably on lateral sides of the base boom section.

8. Locking system for an extendable lattice type crane boom according to any of the preceding claims, wherein said locking system is arranged to lock, at least in an extended position of the boom, a base boom section or a telescopic boom section of the extendable boom with respect to a contiguous telescopic boom section of the extendable boom, wherein said locking system includes a plurality of pins, each pin being configured to extend, in at least the extended position of the boom, at least partly through a corresponding pin receiving aperture of the locking system in the contiguous telescopic boom section, wherein the plurality of pins comprise at least one primary pin adapted to be received in a corresponding primary pin receiving aperture, and at least one secondary pin adapted to be received in a corresponding secondary pin receiving aperture, wherein the at least one primary pin receiving aperture is slotted or egg-shaped or droplet shaped such that a cross-section of the at least one primary pin receiving aperture is larger than a cross-section of the corresponding at least one primary pin to allow movement of the primary pin in the corresponding primary pin receiving aperture.

9. Extendable lattice type crane boom according to any of the preceding claims 1-7, comprising a plurality of telescopic boom sections, wherein each telescopic boom section is lockable with a contiguous telescopic boom section via a locking system according to claim 8.

10. Crane comprising

- an extendable lattice type crane boom according to any of the preceding claims 1-7 or 9, wherein said lattice type boom is movable between a transit position, in which said lattice type boom is in a substantially retracted and substantially horizontal position, and a working position, in which the lattice type boom is extendable;
- a crane base to which said extendable lattice type boom is pivotably connected;
- a boom hoisting system arranged to move the extendable boom between said transit position and said working position;
- a load hoisting system configured to hoist a load.

11. Crane according to claim 10, wherein the boom hoisting system is connected to a distal end of the base boom section as well as to a distal end of the telescopic boom section.

12. Crane according to any of the preceding claims 10-11, wherein the crane base is mountable around a leg of a jack up platform.

13. Method of operating a crane including an extendable lattice type crane boom, preferably a boom according to any of the preceding claims 1-7 or 9, and preferably a crane according to any of the preceding claims 10-12, wherein the extendable lattice type boom comprises a lattice type base boom section and at least one lattice type telescopic boom section, the method comprising the steps of:

- operating a boom hoisting system to bring the extendable lattice type boom from a transit position to a working position;
- operating a telescopic system to adjust the at least one telescopic boom section with respect to the base boom section from a retracted position, in which the telescopic boom section is substantially inside of the base boom

section, to an extended position, in which the telescopic boom section is substantially outside of the base boom section;

- inserting at least one primary pin least partly through a corresponding pin receiving aperture to substantially determine a position of the telescopic boom section with respect to the base boom section, wherein the primary pin receiving aperture is slotted or egg-shaped or droplet shaped to allow movement of the primary pin in the corresponding primary pin receiving aperture;

- adapting an angular position of the telescopic boom section with respect to the base boom section until a secondary pin receiving aperture corresponds with a secondary pin;

- inserting at least one secondary pin in a corresponding secondary pin receiving aperture.

14. Method according to claim 13, wherein during operation of the telescopic system to extend or retract the telescopic boom section with respect to the base boom section, the boom hoist system is controlled to follow the telescopic system to facilitate the movement of the telescopic boom section.

15. Method according to any of the preceding claims 13-14, wherein during operation of the telescopic system, a crane boom angle is approximately 80 degrees.

16. Method according to any of the preceding claims 13-15, wherein during operation of the telescopic system, a measurement system determines an actual position of the telescopic crane boom section with respect to the base boom section, optionally, wherein the measurement system provides output of a determined actual position to an output module.

17. Method according to claim16, wherein, upon approaching a desired extended position, the measurement system controls a speed reduction of the telescopic system.

18. Method according to claim 16 or 17, wherein upon reaching a desired extended position, the at least one primary pin is inserted in the at least one primary aperture after visual inspection by an operator and/or after determination of a final position of the pin receiving aperture by the measurement system.

19. Jack up platform including a crane according to any of the preceding claims 10-12.

20. Jack up platform according to claim 19, wherein the crane base is mounted around a leg of the jack up platform.