

[54] **DOUBLE SLEWING CRANE  
CONSTRUCTION**

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[58] Field of Search..... 212/3, 47, 48, 58 R, 66,  
212/67, 68, 69

[56] **References Cited**

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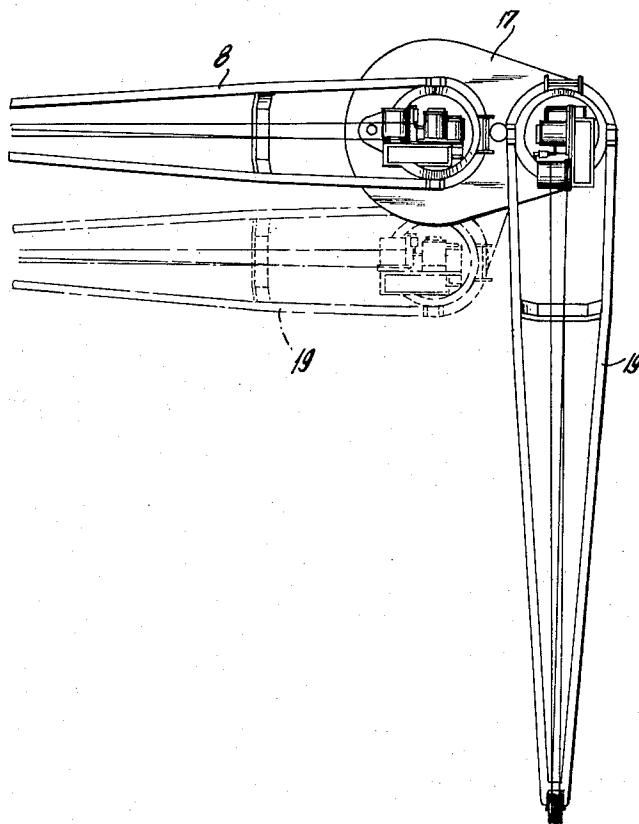
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[57] **ABSTRACT**

A double slewing crane comprises a vertical column support which directly supports a first crane thereabove and which rotatably supports a jib bracket for rotation about the axis of the support and the vertical axis of the first crane. The jib bracket carries a second crane and it is revolved with the jib bracket around the first crane. The drive for revolving the jib bracket with the second crane about the first crane comprises two separate diametrically opposite driving motors having drive shafts with drive pinions which engage a gear ring disposed around the first crane and the support structure.

**7 Claims, 3 Drawing Figures**



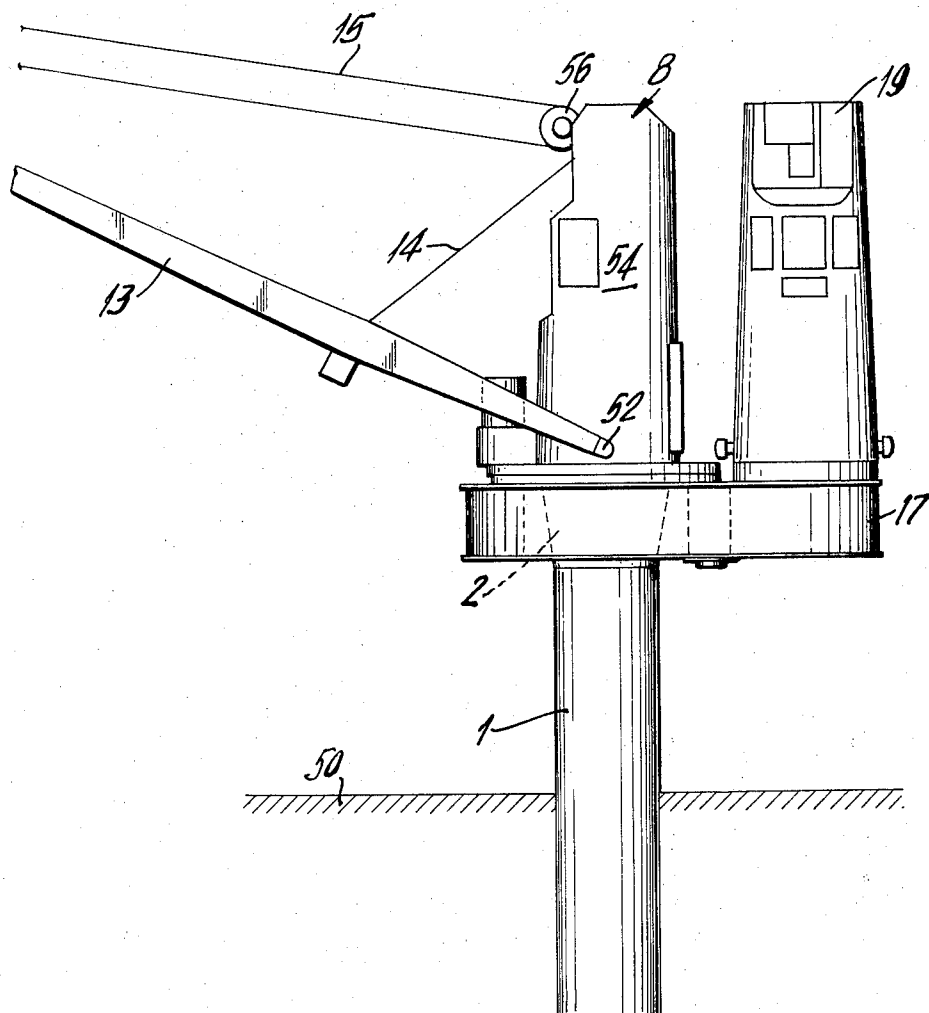


FIG.1

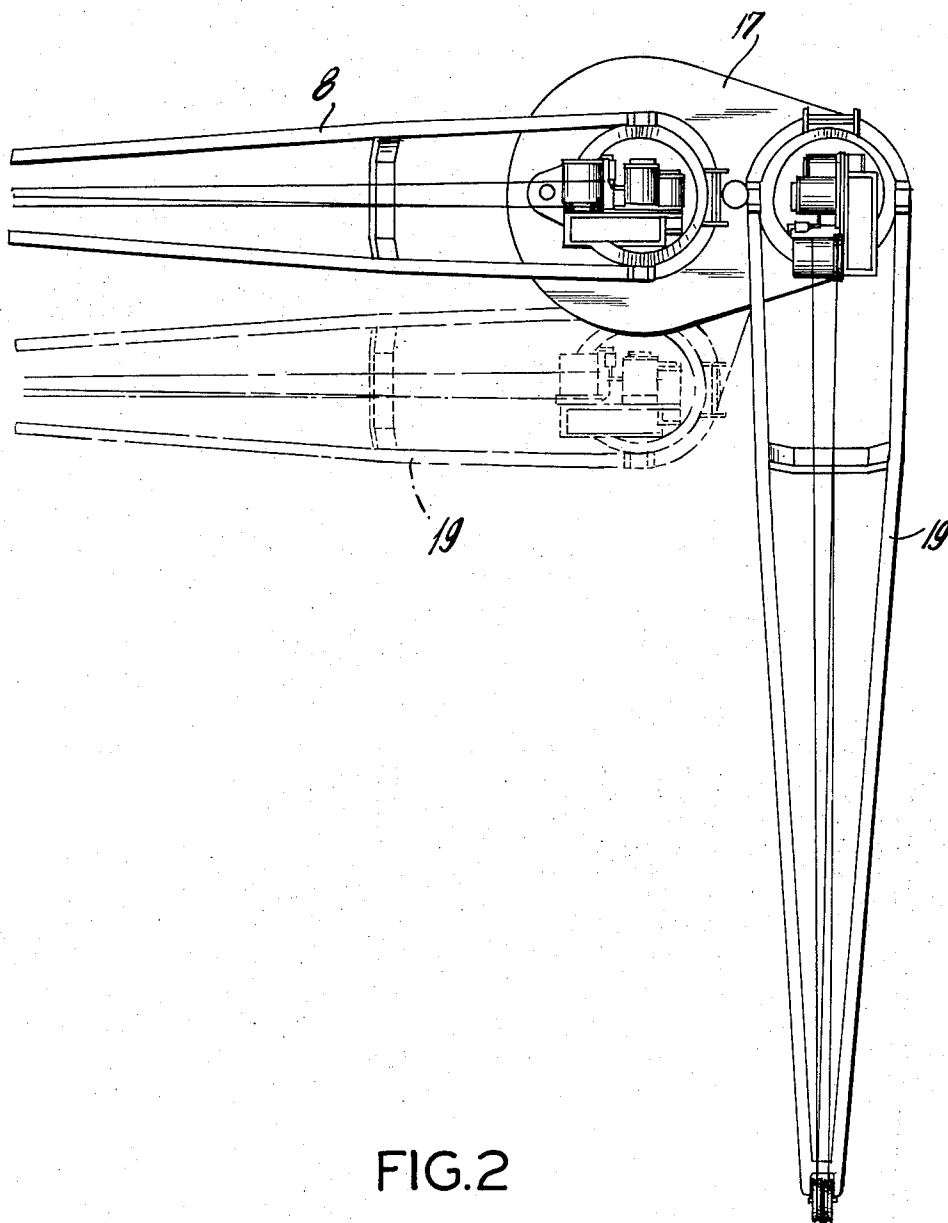
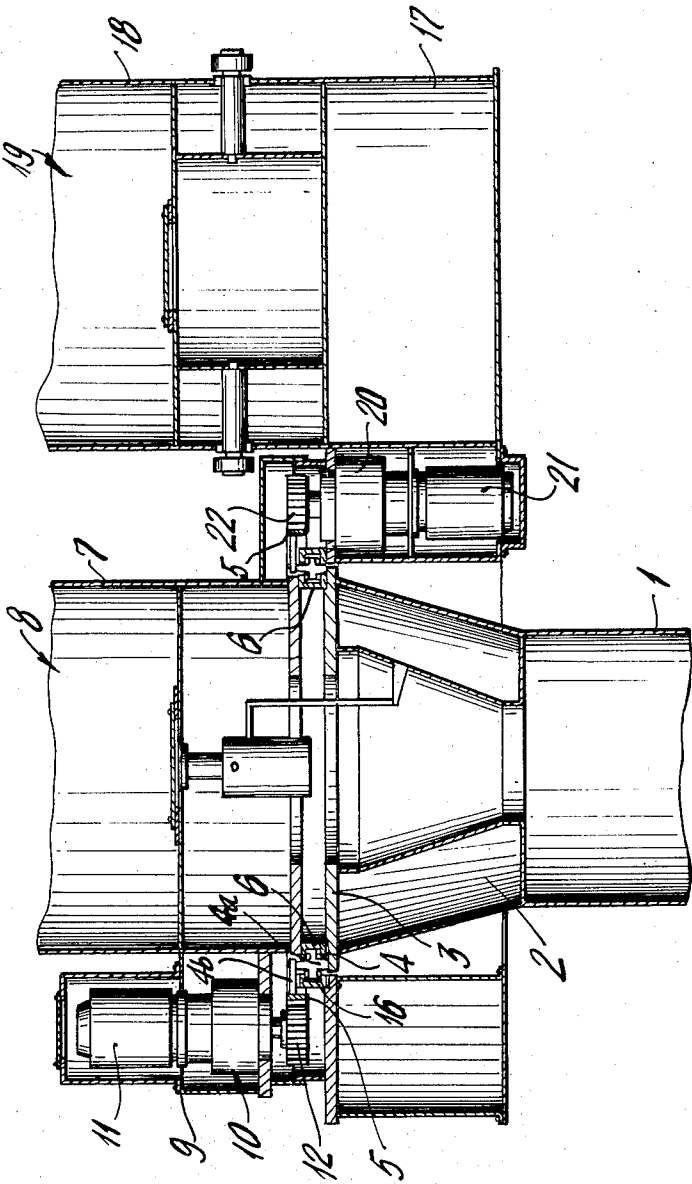


FIG.2



## DOUBLE SLEWING CRANE CONSTRUCTION

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates in general to a construction of cranes and, in particular, to a new and useful double slewing crane which are carried on a common support and with one of them being mounted on the support for revolving movement about the axis of the other which is carried directly on the support.

#### 2. Description of the Prior Art

There is a well known double slewing ship crane which has two crane jibs which are rotatable about a common vertical axis and which are also adapted to swivel about foot-end horizontal axes. At the foot end, each jib is rotatable about a common vertical axis and both jibs are mounted on a turntable which is provided with a mast, cross-beam, trestle, or the like, for slinging the hoisting ropes. In another construction, each crane jib is rotatable at its foot-end about a vertical axis and mounted on a turntable through which a mast of the ship extends. This mast supports a cross-beam provided for slinging the hoisting ropes and it is rotatable to the same extent as the turntable. In both constructions, each crane jib is adapted to swivel about the foot-end vertical axis and the turntable is provided with a swivel drive. Also the crane jibs may each be mounted on a turntable and both turntables are mounted on a first turntable support. Both jib turntables are provided with separate swivel mechanisms which are particularly useful in the cooperation of the two slewing cranes during the double work of the crane. This construction must be provided with three toothed rims and four swivel mechanisms including four swivel motors. In addition, the known construction requires the use of three live ring connections or three similar rotary displacement seatings which have to absorb the tilting forces.

Still another double slewing ship crane of the same construction is known which has three toothed rims and three displacement seatings which are secure against rotation and tilting but have four instead of only two swivel motors which can be selectively connected to the driving pinions by engaging and disengaging geared clutches. The disadvantage is the requirement for the geared clutch as well as the necessity to provide special locking devices by which the swivel mechanisms along with their cranes are retained.

In still another construction corresponding to the previous ones in its effect, there is an arrangement in which the clutch comprises a vertically shiftable pinion shaft which, in its upper position, engages with its pinion into the swivel mechanism of one of the cranes. In its lower position, it engages by its lower pinion into the swivel mechanism of the main turntable. Such a construction shows the same disadvantages of the others in that it requires special locking devices and additional driving mechanisms.

### SUMMARY OF THE INVENTION

In accordance with the invention, there is provided a double slewing crane which permits each of the single cranes to be brought into any swivelling position and also permits both cranes to work in a double operation. The invention provides a swivel driving mechanism of simple construction which permits the slewing crane to perform all of the desired work both in single and dou-

ble operation. The invention also provides an arrangement in which the mounting of the crane is simplified and which ensures that the cranes will be secured against rotation and tilting and thereby reduce the costs.

In the arrangement of the invention, the vertical swivel axis of one of the cranes is mounted so as to be coaxial of a rotatable jib bracket which supports the other crane. The rotation drive requires only one rotatable rim for all of the desired operations and only two rotational mechanisms without requiring clutches or particular locking devices. The crane support which is rigidly fixed to the ship may be provided with a geared rim which engages with the pinions of both of the slewing cranes. The driving motors of both rotational drives may be operated in synchronism in order to obtain a simple construction for the double work operation. When the crane is performing a double working operation, only one control operation is necessary to swivel both cranes simultaneously and uniformly.

With the inventive arrangement, it is useful from the standpoint of saving space, to join the rotatable jib bracket to the crane support by means of a live ring connection. In the same manner, the first crane may be joined to the crane support by means of a live ring connection. The two live ring connections are assembled along with a middle ring to a single construction unit and the four-race middle ring is rigidly connected to the crane support.

The first crane may be mounted so as to be rotatable eccentrically about the common swivel axis. In case, for example, the disturbing radius of the rotatable jib bracket should be too large, the first crane may be connected to the live ring connection eccentrically in accordance with another feature of the invention.

Accordingly, it is an object of the invention to provide a double slewing crane which comprises a support with a first crane assembly carried by the support and a second crane assembly carried by a jib bracket which is rotatable around the support and the first crane.

A further object of the invention, is to provide a double slewing crane particularly for ship use, which is simple in design, rugged in construction and economical to manufacture.

For an understanding of the principles of the invention, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a partial side elevational view of a double slewing crane constructed in accordance with the invention;

FIG. 2 is a top plan view of the crane shown in FIG. 1; and

FIG. 3 is a vertical cross sectional view of the crane shown in FIG. 1.

### GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, in particular, the invention embodied therein comprises a crane which includes an upright crane support or mast 1 which is rigidly fixed, for example, to a hull of a ship 50. The crane support 1 extends substantially vertically upwardly and carries a conical head 2 at its upper end which is connected at

its widened top to a top plate 3. A middle ring 4 of a four-race ball-bearing ring connection is fixed to the top of the top plate 3 and projects upwardly therefrom. The middle ring 4 includes a bearing mounting portion 4a and a top ring portion 4b which is provided with an external annular gear rim 5. An inner ring 6 of the live ring connection is mounted on the inner side of the bearing support portion 4a of the middle ring 4 and it is firmly secured to the lower end of a revolving turret portion 7 of a first crane 8. The revolving turret 7 is provided with a bracket 9 which supports a first swivel or rotatable drive 10. The drive 10 includes an electric driving motor 11 having a drive shaft with a drive pinion 12 which is in meshing engagement with the external gear rim 5. The crane 8 is rotated by the swivel drive 10.

In the embodiment shown, the crane 8 is a luffing crane which comprises a jib 13 pivoted at its inner end on a horizontal axis 52 of a mast 54. A luffing rope 14 extends from the crane jib 13 to the mast 54. A hoisting rope 15 engages around a pulley 56 carried at the top of the mast 54.

As seen in FIG. 3, the double crane includes an outer ring 16 which forms the top of a jib bracket 17 which is rotatable around the vertical axis of the first crane 8 and the support 1. A revolving turret 18 of a second crane 19 is secured to the jib bracket 17 and it is of a construction which is substantially the same as the first crane 8. The jib bracket 17 also supports a second swivel drive 20 which includes a motor 21 which drives a pinion 22 which also meshes with the toothed rim 5.

The invention provides a construction which permits all of the working operations required from a double slewing crane and, at the same time, it is of a most simple and inexpensive construction.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A double slewing crane, comprising a support, a first crane assembly carried by said support and having a mast portion with a jib extending outwardly there-

from and pivoted about a substantially horizontal axis, a jib bracket rotatable around said support and the axis of said first crane mast, a second crane assembly carried by said jib bracket and having a mast portion extending upwardly therefrom at a spaced location from the mast portion of said first crane, said second crane also having a jib extending outwardly from said mast portion and pivotal at its inner end about a horizontal axis, and drive means carried by said support for revolving said jib bracket and said second crane around the axis of said first crane and said support.

2. A double slewing crane, according to claim 1, wherein said crane support comprises a mast adapted to be connected to a ship, said support having an annular external gear rim, said drive means including a drive motor carried by said first crane and having a drive pinion engaged with said gear rim.

3. A double slewing crane, according to claim 1, wherein said support includes an annular gear rim eccentrically arranged in respect to the axis of said first crane and a first drive motor having a drive pinion engaged with said gear rim and being supported on said first crane and a second drive motor having a drive pinion engaged with said gear rim supported on said jib bracket.

4. A double slewing crane, according to claim 3, wherein said first and second drive motors can be operated in synchronism.

5. A double slewing crane, according to claim 1, including a live ring connection connected between said support and said jib bracket.

6. A double slewing crane, according to claim 5, wherein said first crane is also connected to said support by means for a live ring connection, said live ring connection including an intermediate ring portion connected to said support and having a raised portion with an external gear ring, said intermediate portion rotatably supporting said first crane at its inner end and rotatably supporting said jib bracket at its outer end.

7. A double slewing crane, according to claim 1, including a double ring connection between said support and said first crane assembly, said first crane assembly having an axis of rotation which is eccentric to the axis of rotation of said jib bracket.

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