United States Patent

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[33] **Japan**
[31] **43/56,110**

[54] **MARINE DERRICK SYSTEM**
3 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **212/3,** 212/58, 212/48, 254/178
[51] **Int. Cl.** **B66c 23/52**
[50] **Field of Search** 212/3, 58, 59, 48; 254/178

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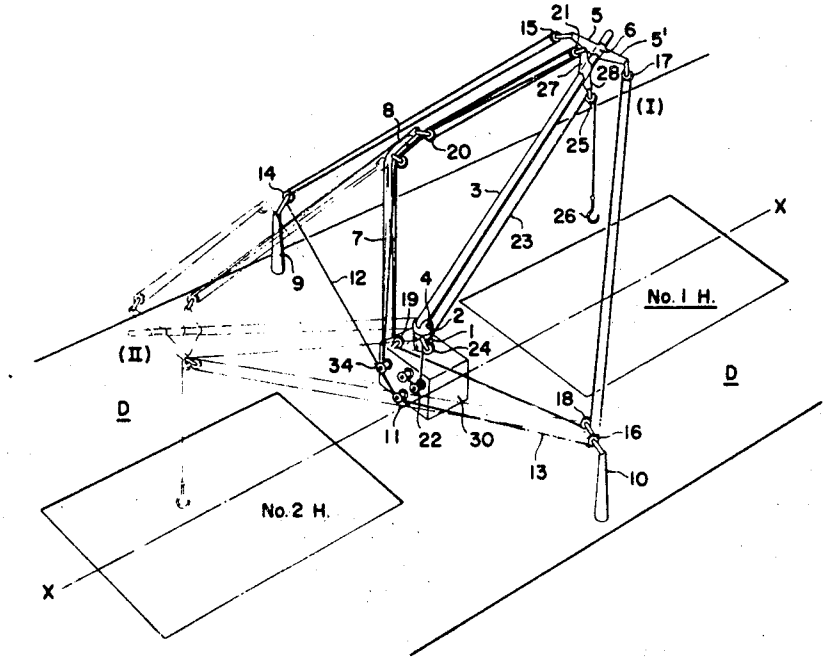
ABSTRACT: A marine derrick system consisting a derrick post erected on deck at a point away from the longitudinal center plane of a ship and having a top end thereof bent inboardly so that it will come within the longitudinal center plane, and a derrick boom having a lower end pivotally mounted on deck at a point within the longitudinal center plane and having an overall length greater than the height of the derrick post so as to render the derrick boom operable in the area both forward and aftward of the derrick post.



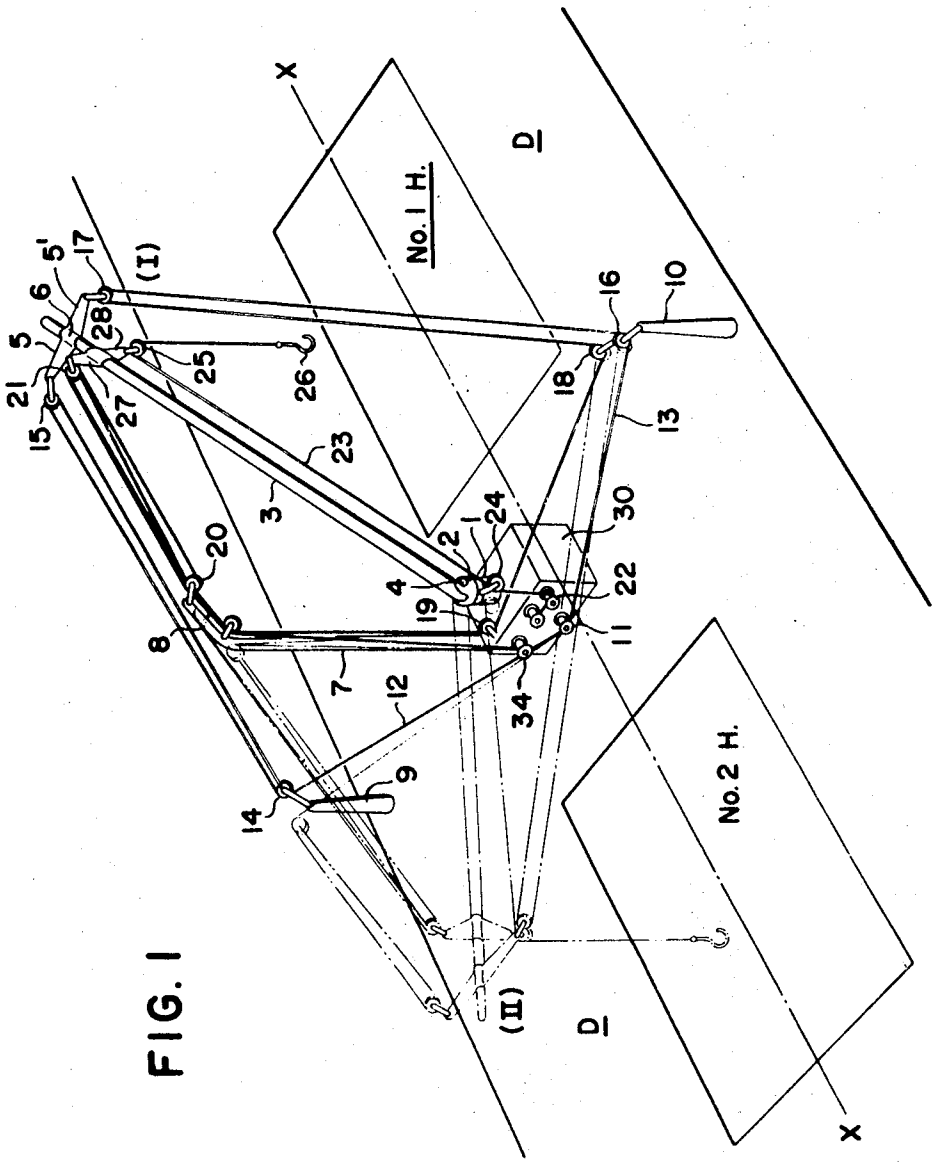


FIG. 1

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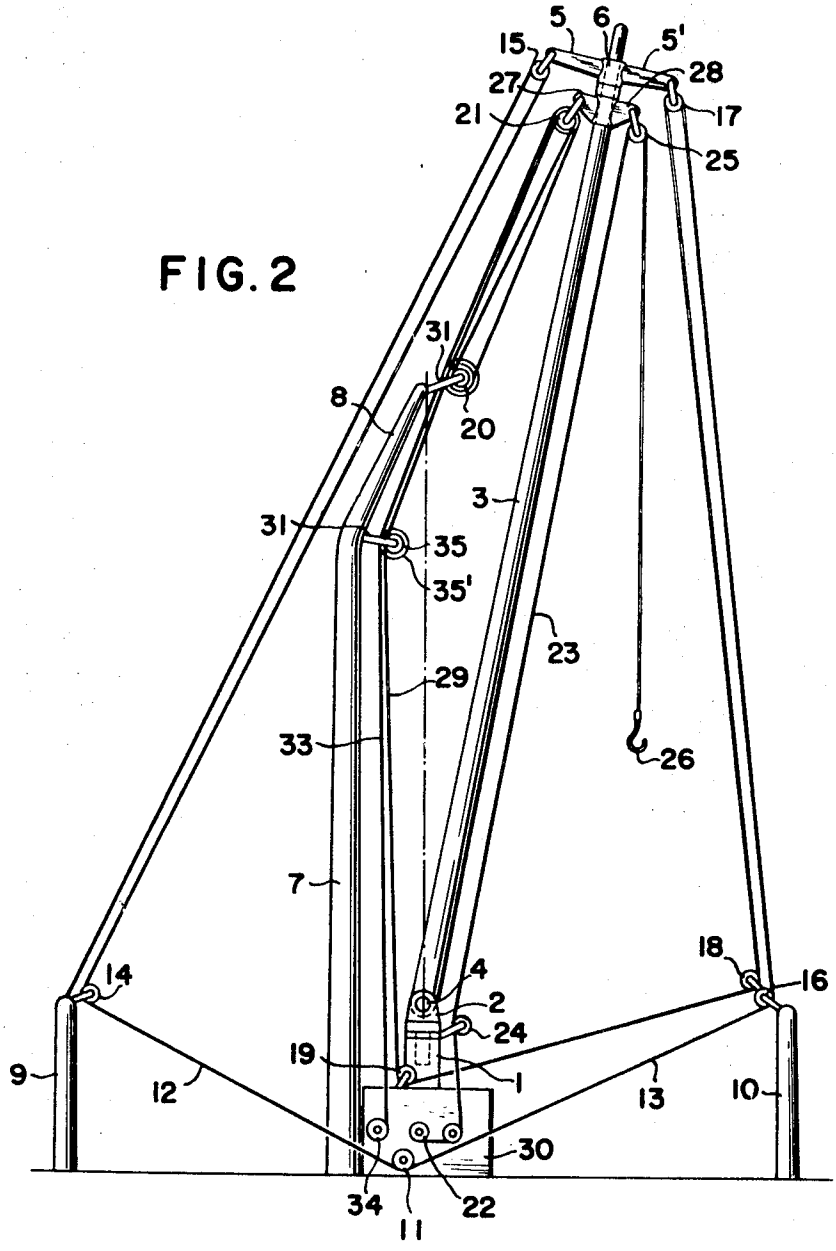
FIG. 2



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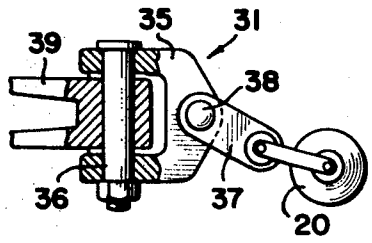


FIG. 3a

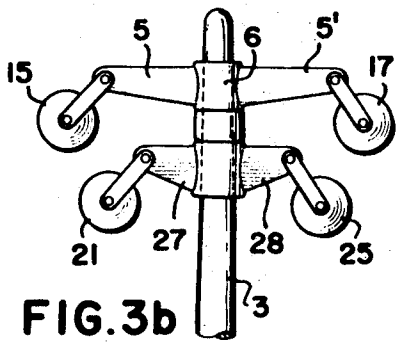
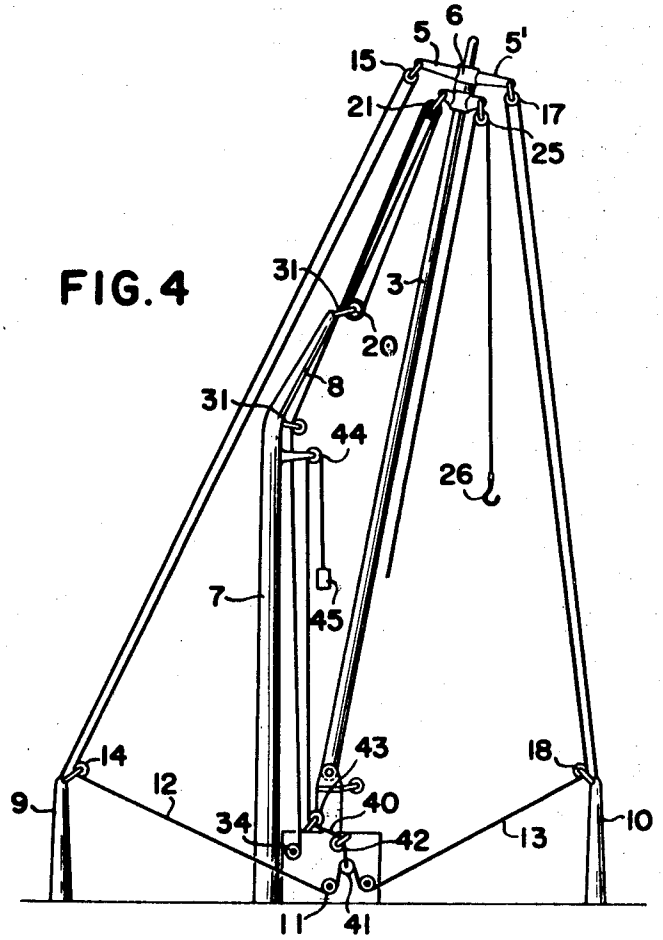


FIG. 3b

FIG. 4



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MARINE DERRICK SYSTEM

The present invention relates to a marine derrick system, more particularly to a marine derrick system rendered operable in the area both forward and aftward of the derrick post.

In the prior art marine derrick system, a derrick boom has been operable only in an area either forward or aftward with reference to the derrick post and therefore, it was necessary to provide the derrick post with two derrick arrangements, one operable forwardly and the other operable aftwardly of the derrick post.

It is a primary object of the present invention to provide a marine derrick boom operable selectively in an area either forwardly or aftwardly of the derrick post.

It is another object of the present invention to provide an economical marine derrick system in which a single derrick boom is rendered operable selectively in the area either forwardly or aftwardly of the same derrick post, thereby permitting any other derrick boom to be eliminated from the derrick post except the single boom as mentioned above.

According to the present invention, there is provided a marine derrick system, comprising a derrick post erected on deck at a point deviated athwartships from longitudinal centerline of a ship and having a top end thereof bent inboardly so as to have said top end located directly above said centerline, a derrick boom having a lower end thereof pivotally connected to the ship's structure on said longitudinal centerline and an overall length greater than height of said derrick post, and a pair of lugs secured on a swivel ring member rotatably mounted on said boom at the top end thereof so as to have guy pendant sheaves depended therefrom.

Now, one preferable embodiment of the marine derrick boom system according to the present invention will be described in detail by way of an example with reference accompanying drawings in which:

FIG. 1 is perspective view showing the marine derrick system according to the present invention;

FIG. 2 is a front view showing the marine derrick system as shown in FIG. 1;

FIGS. 3*a* and 3*b* are side elevation views in enlarged scale showing the fittings used for the derrick system according to the present invention; and

FIG. 4 is a front view showing a variation of the marine derrick system as shown in FIG. 1.

Referring to drawings, FIG. 2 shows a derrick post 7 erected on deck D at a point deviated athwartships from the longitudinal centerline X—X of the ship and having a top end portion 8 bent inboardly so as to have a tip end thereof located above the centerline X—X, and a derrick boom 3 having a lower end thereof pivotally mounted on a housing 30 fixed on the deck D by means of a gooseneck 2 and having an overall length greater than the height of the derrick post 7. A pair of guy posts 9, 10 are disposed one in each side of the derrick post 7 and boom 3 adjacent to the outside shell platings on an extension of the straight line connecting the lower end of the derrick post and that of the boom. In FIG. 1, a mark I denotes a position of the derrick boom used forwardly of the derrick post 7 and 11 a position of the same derrick boom used aftwardly of the post 7.

As shown in FIG. 2, the derrick boom 3, which is swingingly and swivelingly mounted on the housing 30 through intervention of the gooseneck 2 inserted into a socket 1, is provided adjacent to the top end thereof with a metallic swivel ring 6 rotatably fitted over the boom 3 and having both lugs 5, 5′ projected therefrom for depending guy pendant sheaves 15, 17. Another pair of lugs 27, 28 are provided on the derrick boom 3 immediately below the swivel ring 6.

As shown in FIG. 2, a guy pendant 12 in one side, say portside, is connected to the top end of guy post 9 at one end thereof, led upwardly, passed around a sheave 15 depending from the lug 5 of the boom, and around another sheave 14 mounted on the top end of the guy post 9 and then wound around a drum of the guy winch 11.

Another guy pendant 13 in the other side, say starboardside, is wound around the drum of the guy winch 11 at one end thereof in a direction opposite to that of the guy pendant 12, led outboardly, passed around a sheave on top of the starboardside guy post 10, a sheave 17 depending from the lug 5′ of the boom 3, another sheave 18 connected to the top end of the guy post 10, and a sheave 19 located adjacent to the lower end of the derrick post 7, and, then led upwardly to a connector 29. A topping lift wire 33 is wound around a drum of topping lift winch 34 at one end thereof, led upwardly through a sheave 35 depending from the post 7, passed doubly around a pair of sheaves 21 and 20, led downwardly via another sheave 35′ depending from the post 7, and then connected to the connector 29 which will connect the guy pendant 13 and the topping lift wire 33 together so as to maintain the guy pendant 13 taut at all times. At this point, it is noted in FIG. 2 that the sheave 21 is depending from a lug 27 on top of the boom 3 and the sheave 20 is secured on the top end of the derrick post 7 by means of a fitting 31.

A cargo fall 23 is wound around a drum of cargo winch 22 at one end thereof, passed around a sheave 24 adjacent the lower end of the boom 3 and another sheave 25 at the top end of the boom 3, and then terminates in a cargo hook 26.

As shown in FIG. 3*a*, the fitting 31 mounted on the top end of the post 7 comprises a bar member 39 fixedly mounted on the post 7, a yoke 35, and connecting link 37. The yoke 35 is swivelingly connected to the bar member 39 by means of a pin 35. The connecting link 37 is pivotally mounted on the yoke 35 by means of another pin 38 so as to permit the sheave 20 to be swiveled forwardly and aftwardly of the post and to be pivoted upwardly and downwardly about the pin 38.

FIG. 3*b* shows a swivel ring 6 rotatably mounted on the boom 3 at the top end thereof. Lug pieces 5, 5′ are welded to the ring 6 for connecting the sheaves 15, 17 as described hereinabove.

FIG. 4 shows a variation of the embodiment of the marine derrick boom according to the present invention. Both side guy pendants 12 and 13 are secured at one end thereof respectively on the top end of both side guy posts 9 and 10, led respectively to the sheave 15 and 17 at the top end of the boom, brought back respectively to the sheave 14 and 18 on top of both side guy post 9 and 10, and wound around a drum of the guy winch 11 in a direction opposite to each other. One of the guy pendant, for instance, 13 is passed around a sheave 41 which is urged upwardly at all time, as seen in FIG. 4, by means of a wire which is connected to a counterweight 45 via several sheaves 42, 43 and 44. In this manner, the sheave 41 will act to operate as a tensioning means for the guy pendant 13 so as to maintain the latter taut at all times.

Now, operation of the marine derrick system according to the present invention will be described hereinafter. Assuming that the boom 3 is shifted from the position forwardly of the derrick post 7 to that aftwardly of the same, that is, for instance, from the cargo-handling position for No. 1 hatch to that for No. 2 hatch as shown in FIG. 1, the derrick boom 3 is first swing to the side remote from the derrick post 7 over No. 1 hatch by adjusting both side guy pendants so as to have the boom 3 directed to the guy post 10 located oppositely to the derrick post 7 and then the boom is brought into substantially vertical position until it is held in an angle less than 10° with the vertical by winding up the topping lift wire 33. As the boom is swung into one side as described hereinabove, the gooseneck 2 will be rotated until the pin 4 at the bottom end of the boom 3 is placed in a position substantially parallel to the longitudinal centerline of the ship, although there is a small amount of error in the direction of the pin due to friction and clearance at the gooseneck.

When the gooseneck 2 is rotated by an angle of 10° to 40° manually or by using a suitable mechanical means, the boom 3 will be also rotated clockwise as shown in FIG. 1 at a small angle to the vertical and brought into the position for handling the cargo above No. 2 hatch. And then, the boom 3 will be lowered to a desired angle to the vertical by paying out the

topping lift wire. At this point, it is noted that since the swivel ring **6** is rotatably mounted on the boom **3** at the top end thereof, each of both side guy pendants can be maintained in untwisted condition at all times. Also, since the length of boom **3** is sufficiently greater than the height of the derrick post **7**, the guy pendant located in the side, toward which the derrick post **7** is deviated or shifted from the longitudinal centerline of the ship, that is the guy pendant **12** in FIG. **2** will swung over the derrick post **7** without being interfered by the latter.

Since the top end **8** of the derrick post **7** and the gooseneck **4** of the boom **3** are located in the same vertical line, and since both guy post **9**, **10** are located on athwartship straight line connecting the lower end of the derrick post **7** to that of the boom **3**, the derrick boom **3** can be operated to handle the cargo aftwardly as well as forwardly of the post. Accordingly, one set of derrick system will suffice where two sets of derrick systems are normally required.

And, both side guy pendants are maintained taut at all times in the derrick system according to the present invention, since one of them is connected to the slackness absorbing member, such as the topping lift wire or counterweight means.

What is claimed is:

1. A marine derrick system for use aboard a ship comprising only a single derrick spot erected vertically on the deck of the ship, said post being located at a point athwartship from the longitudinal centerline of the ship;

a bent portion atop the derrick post and bent inwardly forming a unitary extension of said post, so that the top end of the bent portion is located directly above the centerline of the ship and supports a guide sheave;

gooseneck means rotatably mounted on the deck on the longitudinal centerline of the ship;

a derrick boom attached at its lower end to the gooseneck means, said boom having a greater length than the derrick post;

first and second pairs of lugs rotatably mounted on the upper end of the boom, both pairs of lugs supporting sheaves;

a topping winch;

topping means extending from the topping winch, past the guide sheave on the post and through the sheave on one of said first pair of lugs, to change the vertical angle of the boom;

a cargo-moving cable passing through the sheave on the other side of said first pair of lugs;

a first guy post positioned athwartship near the outer edge of the deck and supporting a guide sheave;

a second guy post positioned athwartship near the other outer edge of the deck, transversely opposite the first guy post, supporting a guide sheave; said first and second guy posts being located on an athwartship straight line connecting the lower end of said derrick post to that of the boom,

a pendant winch;

a first guy pendant extending from the pendant winch through the first guy post sheave and then through the sheave on one of said second pair of lugs on the boom;

a second guy pendant extending from the pendent winch through the second guy post sheave and then through the sheave on the other of said second pair of lugs on the boom, the athwartship's mounting of said post and guy posts and said mounting of the boom on the centerline permitting the boom to rotate and operate on either the forward or the aft sides of an athwartship vertical plane including the derrick post without rotating the post, and also permitting said boom to operate forwardly and aftwardly of said single post.

2. The marine derrick system of claim **7**, wherein at least one of the guy pendants is connected to the topping means at the end thereof opposite to the end in contact with the topping winch.

3. The marine derrick of claim **7**, further including means connected to at least one of the guy pendants for absorbing slack.