F. E. HULETT & R. E. SHEAL.

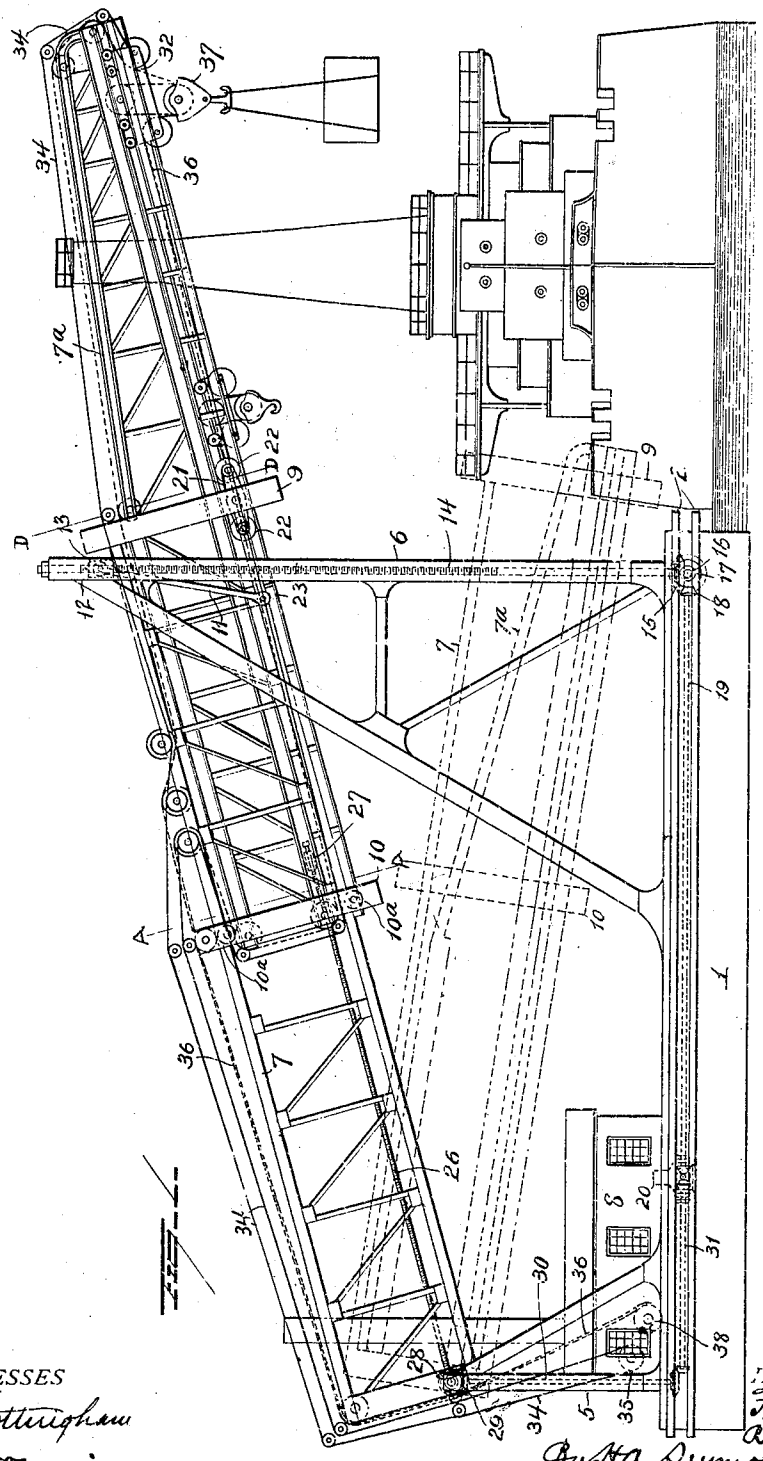
PONTOON CRANE.

APPLICATION FILED JUNE 15, 1914.

1,161,680.

Patented Nov. 23, 1915.

2 SHEETS--SHEET 1.



WITNESSES

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2 SHEETS—SHEET 2.

FIG. 2.

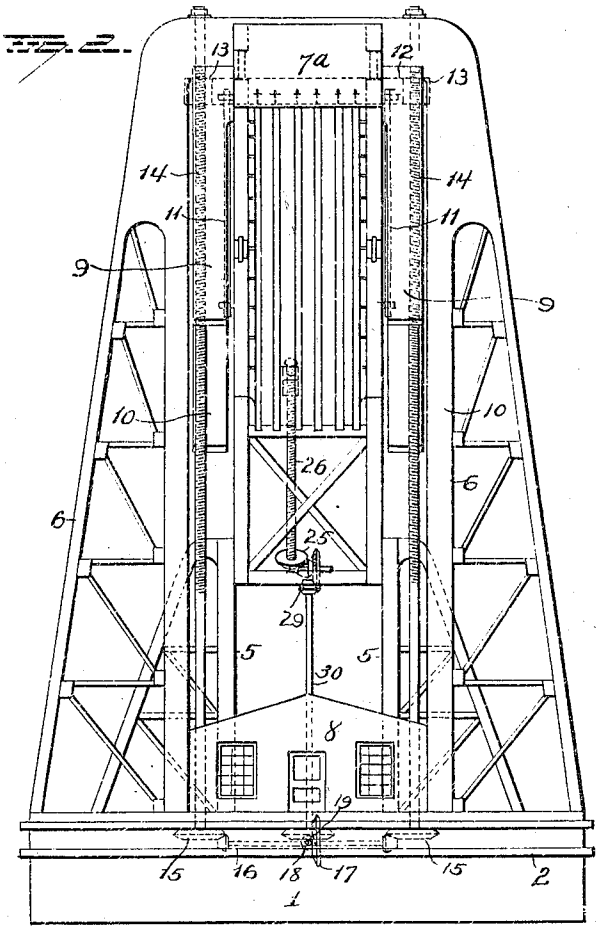


FIG. 3.

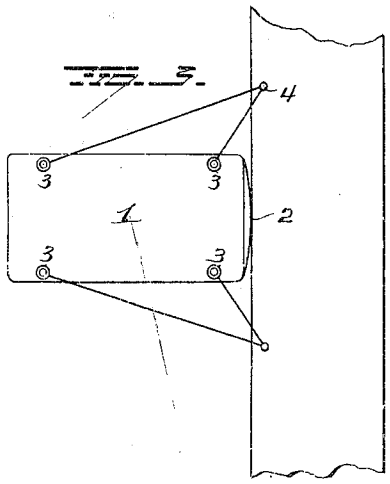


FIG. 4.

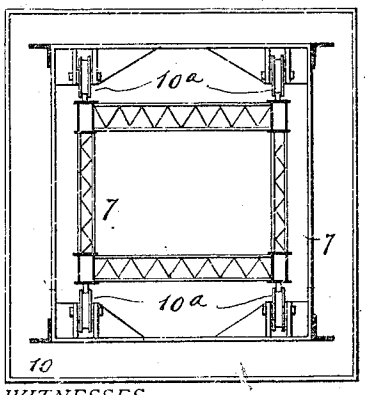
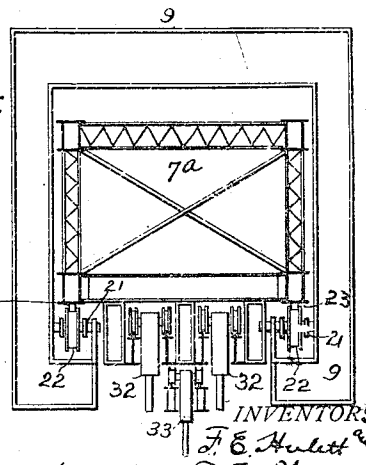


FIG. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PONTOON-CRANE.

1,161,680. Specification of Letters Patent. Patented Nov. 23, 1915.

Application filed June 15, 1914. Serial No. 845,270.

To all whom it may concern:

Be it known that we, FRANK E. HULETT and ROBERT E. SHEAL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pontoon-Cranes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in pontoon cranes.

Pontoon cranes, in use at the present time, are of two types, one known as the bridge type, and the other as the revolving type having a boom with a variable radius. The chief objection to the bridge type is instability in rough waters and the difficulties of maneuvering it, to place it properly in position alongside of a ship, and the chief objections to the rotating type are instability in rough water; requires a large and unwieldy pontoon; and cannot be used to advantage in making lifts from large boats on account of the limited space on the boats for the rotation of the boom. Again both of these types of pontoon cranes are limited to use in inland and still waters and it has never been considered safe to take either of these heavy and high cranes to sea in an assembled condition.

The object of this invention is to provide a pontoon crane possessing the advantages of both the bridge and revolving types, and without some of the objectionable features of each, and it consists in the parts and combinations of parts as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation showing the crane moored to the side of a vessel; Fig. 2 is a view in end elevation; Fig. 3 is a diagrammatic view in plan, showing the shape of the front end of the pontoon and also the method of mooring the same to the side of a vessel; Fig. 4 is a view in section on the line A—A, of Fig. 1 and Fig. 5 is a similar view on the line D—D, of Fig. 1.

1 represents a pontoon, rectangular in shape, and provided at its front end with a curved fender 2, adapted when resting in contact with the side of a vessel, to permit the pontoon to be swung slightly so as to carry its boom into position over the hatch or a particular part of the deck. As shown in Fig. 3 we provide the pontoon with four capstans 3, located adjacent the four corners, and connect a cable or chain from each, to fixed fastenings 4 on the vessel, so that by proper manipulation of the capstans, the pontoon can be swung in either direction, the side of the vessel forming the fulcrum for the pontoon.

5 are boom carrying frames projecting upwardly from the rear end or stern of the pontoon, and 6 is a boom elevating and lowering frame of greater height than frame 5, and located adjacent the front end or bow of the pontoon. The boom 7 is journaled at its rear end to the frames 5, at the top of the latter, so that in both its elevated and lowered positions there will be ample room below it at the rear end of the pontoon, for boiler and engine house 8. The boom is made telescopic, the front section 7^a being mounted and movable within the rear or main section 7. This rear section 7 is in skeleton form as shown, preferably square or other angular shape in cross section and is provided at its free end in front of frame 6, with the yoke 9, and at a point intermediate the frames 5 and 6 with the yoke 10. The free end of the section 7 of the boom, is supported on links 11, one at each side, which are connected at their upper ends to the beam 12, which latter is located between and is guided by the two side members of the upright frame 6, between which the section 7 of the boom passes. This beam 12 is provided adjacent each end with a nut 13, which nuts are engaged by the elevating screws 14, journaled at their upper ends in the top of frame 6, and at their lower ends in bearings on, or adjacent the deck of the pontoon. Each screw is provided at its lower end, preferably below the deck, with a bevel gear 15 which meshes with bevel pinions on the shaft 16, the latter having a driving gear 17 thereon which meshes with pinion 18 on drive shaft 19, connected up with a motor 20. With this construction and arrangement of parts, both screws 14 will be rotated simultaneously to elevate or lower the beam 12, and the free end of boom 7 is as before explained, suspended from said beam by the links 11.

Section 7^a of the boom is similar in construction to the main section 7, but is smaller, and is carried by, and telescopes

with the latter. The main section 7 of the boom, is provided preferably at the yoke 10, with wheels 10^a located above and below section 7^a of the boom and at both sides of same, for supporting the rear end of the said section 7^a, as shown in Fig. 4, and it is also provided at its yoke 9, as shown in Figs. 1 and 5, with the equalizing trucks 21, one at each side of the boom and below the section 7^a thereof, for supporting said latter sections at the outer end of boom 7. Each equalizing truck 21 is pivoted centrally to the yoke 9, and carries two wheels 22 on which the rails 23, secured to the lower face of section 7^a rest and move. The rails 23 secured to the lower face of section 7^a of the boom rest and move on the lower wheels 10^a and 22, and section 7^a is provided on its upper surface with rails 25 which move in contact with the upper wheels 10^a which support the rear or inner end of the section 7^a when the latter is in its projected position.

The main section 7 of the boom, is approximately as long as the pontoon, and preferably projects slightly beyond the front end thereof, as shown in Fig. 1, and with the construction so far described it will be seen that it can be elevated to the position shown in full lines in Fig. 1, which is its normal working position, or it can be lowered so that its front or free end can be well down on the deck. The section 7^a of the boom is carried by and within the main section, and is adapted to be projected, as in full lines in Fig. 1 so as to overreach or overhang a vessel, or be withdrawn into the main section and lowered as shown in dotted lines in Fig. 1. The mechanisms for elevating and lowering the boom, and also for projecting and retracting the inner longitudinally movable section thereof, are not material to our invention. We have however described screw mechanism for raising and lowering the boom, and have also shown a screw 26 for projecting and retracting section 7^a thereof. This screw is carried by section 7 of the boom at the rear end of the latter, and passes through a nut secured to section 7^a, and is provided at its rear end with a bevel wheel 28 which meshes with the bevel pinion 29 on upright shaft 30, the latter being geared up to drive shaft 31 suitably coupled up to the motor 20. By rotating the screw 26 the section 7^a of the boom may be wholly or partly projected or retracted.

The main boom is open on its lower side or face as shown in Fig. 5, to permit of the necessary travel of the trolleys, and the latter are mounted on trackways at the underside of the movable section 7^a of the boom. In the drawings, Fig. 5, we have shown trackways for two main trolleys 32, and an intermediate trackway for an auxiliary trolley 33. These trolleys may be propelled by any suitable means, but for the purpose of illustration we have shown traversing means for one, consisting of a cable 34 secured to the outer end of a main trolley 32, and passing forwardly to the front end of section 7^a, and up over the latter and also over main section 7 of the boom, and thence down in rear of the latter and around the trolley drum 35, which may be driven by a suitable motor. The cable 34 is wound several times around this drum 35 and then passes up to the rear of section 7^a and over the latter to a point in advance of the rear end of section 7^a, when the latter is in its fully projected position, and thence back and down to the lower side of said section 7^a, and is secured at its other end to the rear end of trolley 32, the cable being sustained and guided in its circuit around the boom's sections, by suitable sheaves as shown. With this construction the cable is kept taut during the projecting and retracting movement of section 7^a and also while the latter is at rest, and by rotating the drum, the trolley 32 will be moved on its trackway carried by the boom.

The hoist cable 36 illustrated by dotted lines in Fig. 1, carries the hoist block 37 and passes up and around the sheaves on the trolley 32. One part of said cable then passes forwardly to the end of section 7^a, and up and over the latter, and the other part extends rearwardly below section 7^a to the rear end thereof, and up and then forwardly to a point in advance of the rear end of section 7^a, when the latter is fully projected, and both parts then pass rearwardly over main section 7 of the boom to the rear end of the latter, and thence down and are secured to the hoist drums 38, the cable being supported and carried on sheaves on the two sections of the boom. By this arrangement the cable is kept taut during the movements of section 7^a of the boom, and by actuating the drum 38 the cable will elevate or lower the block, the direction of movement of the latter being dependent of course on the direction of rotation of hoist drum 38.

It is not necessary that the free end of the boom come within the outlines of the pontoon, as it can be readily elevated before bringing the bow of the latter into contact with the side of a vessel. It can be made to clear obstructions by retracting and elevating it, and when in its lowest position gives a very low center of gravity and consequently increases its stability, which makes it possible to be towed to sea in an assembled condition, and also available for moving around inland harbors and bays, from one location to another, with decidedly less danger.

By rounding the end of the pontoon, and the arrangement of capstans as shown, the pontoon can be slightly rotated relative to the work on which it is engaged, thus hav-

ing the advantage of the rotating type in regard to placing and displacing connecting members of a vessel.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of our invention. Hence we would have it understood that we do not wish to confine ourselves to the exact construction and arrangement of parts shown and described but,

Having fully described our invention what we claim as new and desire to secure by Letters-Patent, is:—

1. The combination of a pontoon having a curved front end whereby it may be partly rotated with relation to the work, a longitudinally movable boom adapted to be projected over said curved end and a trolley adapted to travel on said longitudinal movable boom.

2. The combination of a potoon having a curved front end, a plurality of capstans at each side of the pontoon, a telescopic boom adapted to be projected over or in advance of said curved end, means for raising and lowering the boom and a trolley traveling on the same.

3. The combination of a pontoon, a frame on and adjacent one end of the latter, a telescopic boom pivoted at its rear end to said frame, means adjacent the other end of the pontoon for raising the boom from the deck of the pontoon to working position, and a trolley traveling on said boom.

4. The combination of a support, a telescopic boom pivoted at its inner end to said support, means located on and adjacent the other end of the support whereby the free end of the boom may be raised from the support to working position, and a trolley traveling on said boom.

5. The combination of a pontoon, a boom pivotally supported at one end on a bearing on said support, fixed means straddling the boom adjacent its free end for raising the latter from its lowered position on the support to its operative position, a trolley mounted to travel on said boom and means for actuating the trolley.

6. The combination of a pontoon, two frames thereon, a telescopic boom one member of which is pivoted to one of said frames and straddled by the other, means carried by said latter frame for raising the free end of the boom from the deck of the pontoon, a trolley carried by said boom and means for actuating the trolley.

7. The combination of a pontoon, a telescopic boom one member of which is pivoted at one end to a support on said pontoon, means also engaging said pivoted member of the boom for raising and lowering the free end of the latter, and means for projecting and retracting the sliding member of the boom.

8. The combination of a pontoon, two frames thereon, one adjacent each end of the pontoon, a telescopic boom pivoted to one of said frames, and means carried by the other frame for raising and lowering the free end of the boom.

9. The combination of a pontoon, two frames thereon, one adjacent each end of the pontoon, a telescopic boom pivoted to one of said frames, means carried by the other frame for raising and lowering the free end of the boom, and means for projecting and retracting the movable member of the boom.

In testimony whereof, we have signed this specification in the presence of two subscribing witnesses.

FRANK E. HULETT.
ROBERT E. SHEAL.

Witnesses:
W. H. SHEPARD,
F. J. MACDONALD.