G. H. HULETT.

COUNTERWEIGHT FOR PONTOON CRANES.

APPLICATION FILED AUG. 28, 1908.

960,225.

Patented May 31, 1910.

3 SHEETS—SHEET 1.

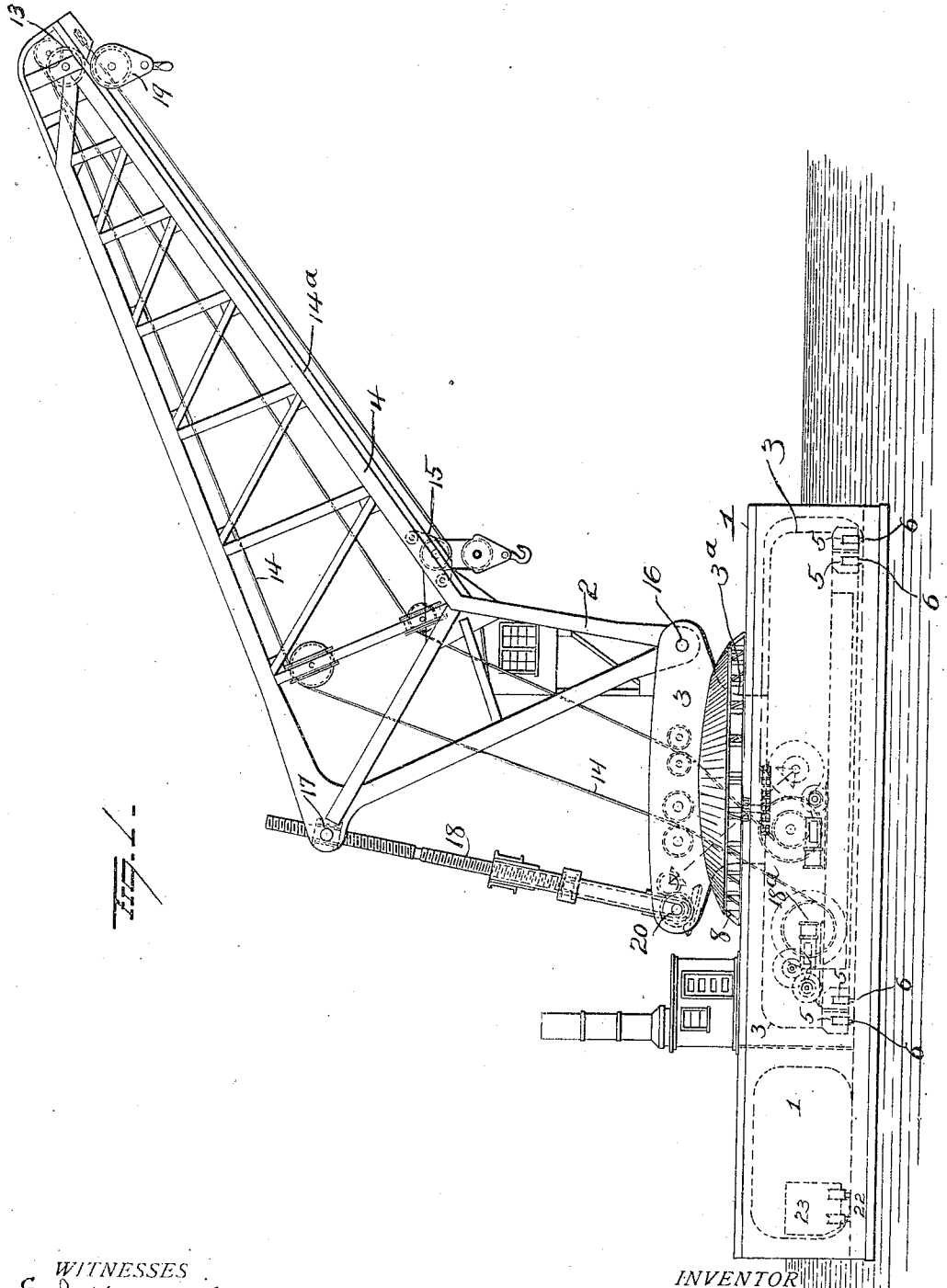

Fig. 1.

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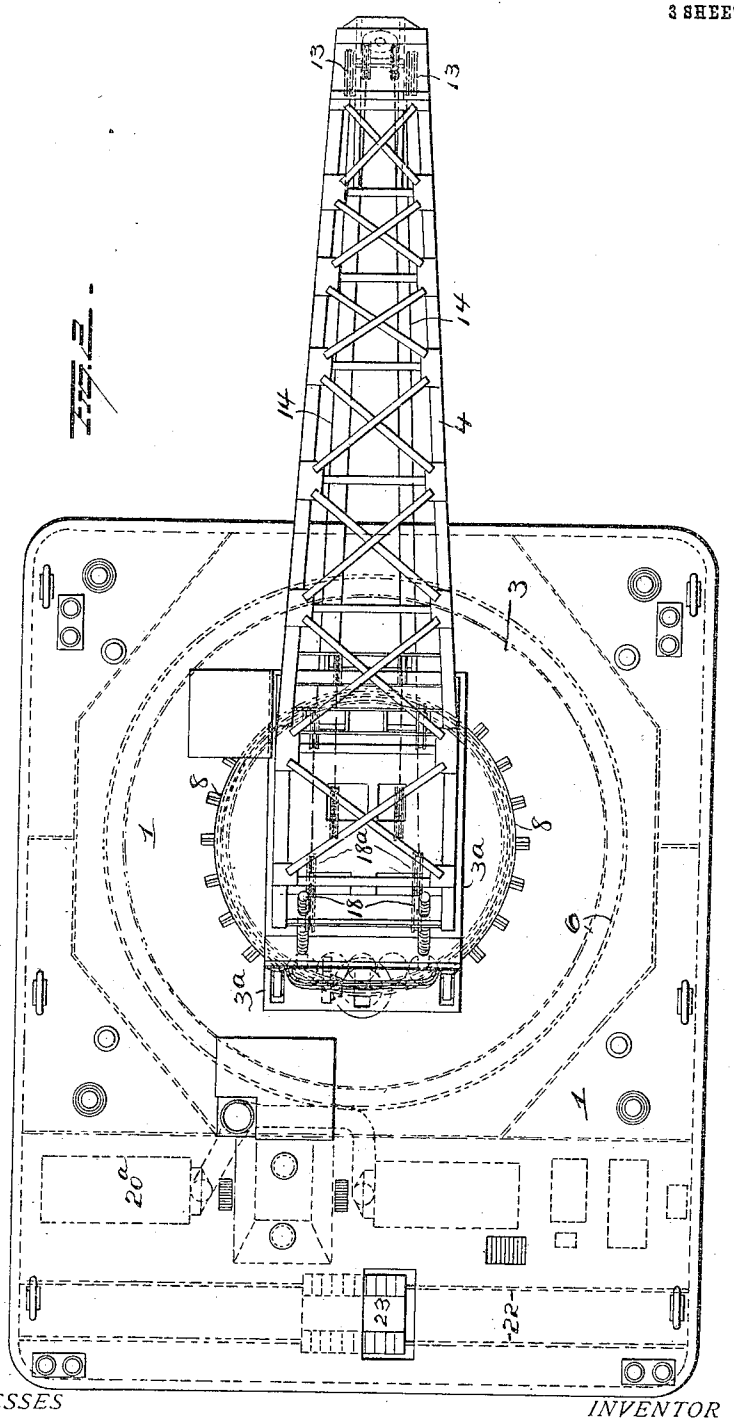

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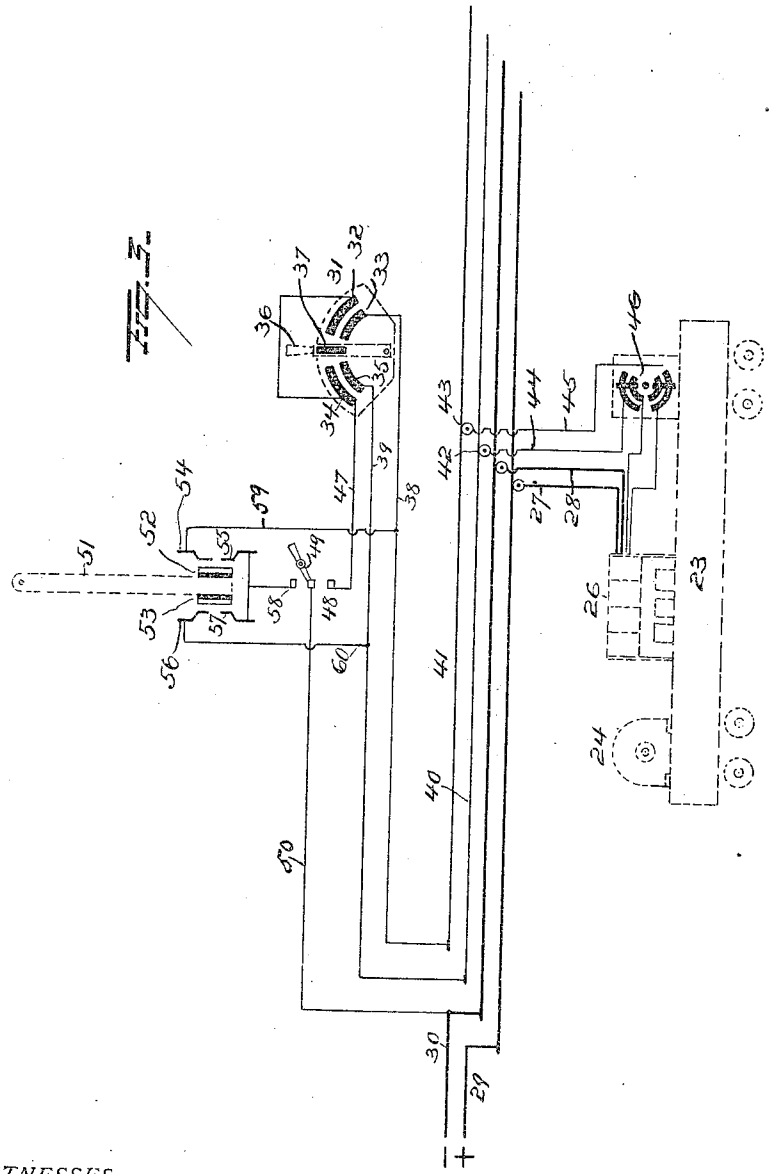

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UNITED STATES PATENT OFFICE.

GEORGE HENRY HULETT, OF CLEVELAND, OHIO, ASSIGNOR TO THE WELLMAN-SEAVER-MORGAN COMPANY, OF CLEVELAND, OHIO.

COUNTERWEIGHT FOR PONTOON-CRANES.

960,225. Specification of Letters Patent. Patented May 31, 1910.

Application filed August 28, 1908. Serial No. 450,766.

To all whom it may concern:

Be it known that I, GEORGE HENRY HULETT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Counterweights for Pontoon-Cranes; and I 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.

My invention relates to an improvement in counterweights for pontoon cranes, the object being to provide automatically controlled means movable transversely of the pontoon for counterbalancing the weight of the load carried by the boom.

With this object in view my invention consists in a crane mounted to turn and a counterbalance movable on the crane base, and preferably in a plane below the surface of the water of flotation.

My invention further consists in a pontoon, a crane carried thereby, the base of the crane being in a plane below the deck of the pontoon, a counterweight movable on the base of the crane and automatic devices actuated indirectly by the weight of the load for controlling the movements of the counterweight.

My invention further consists in the parts and combination 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 of a pontoon crane embodying my invention. Fig. 2 is a view in plan of the same, the deck of the pontoon being broken away to show the base of the crane and the counterweight, and Fig. 3 is a diagram of the counterweight and manual and automatic devices for actuating the same.

1 represents a pontoon, and 2 the crane, the latter comprising a base 3 and a boom 4. The pontoon 1 is rectangular in shape, and is provided in its deck, between its transverse center and one end, or nearer one end than the other, with an opening preferably circular in form, through which the neck 3^a of the base 3 of the crane 2 protrudes. This base is rectangular in shape as shown in Fig. 2 and is provided at its ends with track wheels 5 which latter rest and move on the circular tracks 6 secured to the bottom of the pontoon in a plane below the surface of the water in which the pontoon is floating. The neck 3^a of the crane is located midway the base 3 and as before explained projects upwardly through the opening in the deck of the pontoon, and is then expanded or enlarged as shown in Fig. 1 for the attachment of the boom or jib 4. By means of the engines and gearing, the base carrying the boom or jib may be rotated so as to carry the free end of the boom carrying the hoist chain over either side or end of the pontoon.

The boom 4 may be of any approved form but for the purposes of illustration I have shown it in skeleton form, and is provided at its extreme outer end with sheaves 13 over which the hoist chains 14 pass and is also provided on its under side with tracks 14^a on which the trolley or auxiliary hoist 15 travels. This boom is pivoted at 16 to the base 3 and is provided with the nuts 17 which are engaged by screws 18 pivoted at 20 to the neck of the base 3. These screws are geared to rotate in unison, and when rotated, operate to raise or lower the outer end of the boom.

Located on the base 3 within the pontoon 1 is a pair of hoisting engines. These engines are located on the base on the end thereof removed from the overhanging boom so as to act as counterweight for the latter. From the drums 18^a of these engines, cables 14 are led over suitable sheaves in the base 3 and boom, and around sheaves 13 at the free end of the boom and down and around sheaves in the hoist block 19 and then up to the boom to which the free ends are attached in the usual manner.

The boilers 20^a are located within the pontoon at the rear end thereof in a position to counterbalance the weight of the crane. The rotating base also carries the engine and drum for actuating the auxiliary trolley 15, which as before explained is mounted to travel on the tracks 14^a on the boom 4, and is employed for lifting and transferring lighter articles.

The pontoon is provided transversely its length at its rear end with the trackway 22 on which the counterweight 23 travels. For the purpose of propelling the counterweight 23 and for controlling the movements of the same the devices now to be described will be employed: An electric motor 24 is shown

mounted upon the counterweight for propelling the latter, but this motor may be carried by the pontoon and connected by cable or chain, or in any other well known manner, for moving the counterweight on the pontoon.

A magnetically operated controller 26 for the motor may be located upon the counterweight and connected by conductors 27—28 and trolley wheels with the leads 29—30 from any convenient source of electrical energy. A manually operated controller 31 is provided, and comprises a suitable support for two pairs of contact strips 32—33 and 34—35, and a lever 36 having a contact plate 37 for connecting the contact strips of the respective pairs of strips. Conductors 38—39 are connected with the contact strips 33 and 35 and these conductors are connected with trolley wires 40—41. Trolley wheels 42—43 are adapted to travel in contact with said wires and these trolley wheels are connected by conductors 44—45 with the terminals of a reversing switch 46, the other terminals of said switch being connected with the controller 26.

The contact strips 32—34 of the switch 31 are electrically connected together, and the strip 34 is connected, by a conductor 47 with the contact block 48 of a double throw switch, the lever 49 of which is connected by a conductor 50 with the lead 30.

A pendulum 51 is mounted in any convenient position on the apparatus, and carries at its free end, contact plates 52—53, disposed between pairs 54—55 and 56—57 of contact fingers. The fingers 55—57 are electrically connected together and electrically connected with the contact block 58 of the double throw switch. The contact finger 54 is connected, by a wire 59 with the conductor 38, and the contact finger 56 is connected by a wire 60, with the conductor 39.

It is apparent that when the switch lever 49 is closed on the contact block 58, the tilting of the pontoon will cause the pendulum 51 to swing and connect one or the other pair of contact fingers. The circuit which includes the controller 26, reversing the limit switch 46 and motor 24, will thus be closed, and the motor caused to operate to propel the counterweight 23 from one end of the base to the other. When the counterweight shall have reached the end of its travel in one direction, it will operate to right the pontoon,—causing the pendulum to swing and open the circuit, and the reversing switch 46 will be operated to reverse the motor circuit, so that the motor will operate to run the counterweight back to the other end of its trackway when the pontoon tilts sufficiently in the opposite direction to cause the pendulum to coöperate with the other pair of contact fingers and thus again close the circuit.

When a load is taken upon the boom, and the latter is turned it will cause a certain and predetermined amount of movement of the pontoon in the direction of the load. The pendulum, swinging in the same direction, would record this movement and after the predetermined amount of movement has been reached, the pendulum will close the circuit as before explained and thus cause the operation of the motor to move the counterweight 23 toward the opposite side of the pontoon, thus balancing the pontoon and loaded boom. When the load is gradually released from the end of the boom, the pontoon will rise at the side from which the boom projects and lower on the opposite side and when it has passed the horizontal position a predetermined extent, the pendulum will have swung from one pair of contact fingers (thus opening the circuit) and then connect the other pair of contact fingers to again close the circuit. The motor connections having been changed by the operation of the reversing switch 46, the motor will now operate to move the counterweight back to its original position where it is designed to balance the pontoon when there is no load on the boom.

It will be seen that with the use of my improvements the movements of the counterweight 23 for balancing the pontoon when the crane is loaded and when unloaded, is electrically controlled, and that such control is automatic.

Should it be desired to control the electrical devices for moving the counterweight 23, this can be accomplished with the use of the manually operated switch 31. When the switch 31 is employed, the lever 49 of the double pole switch, will be thrown to make contact with the contact block 48, thus closing the circuit to the switch 31 and opening that portion of the circuit which includes the contact fingers 54—57.

One of the most important features of my improvement is that of counterweighting the crane. As shown and described the crane opposite or in rear of the boom is counterweighted by the engines, drums and other parts, and this weight together with the movable counterweight is sufficient to counterbalance the boom. By supporting the base of the derrick on the bottom of the pontoon, and mounting the engines and counterweight below the water line, the center of gravity of the entire crane is kept at the lowest possible point, and the highest stability obtained.

It is evident that changes in the construction and relative arrangements of the several parts might be made without avoiding my invention and hence I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described, but,—

Having fully described my invention what

I claim as new and desire to secure by Letters-Patent, is:—

1. The combination with a pontoon and a crane thereon, of a movable counterweight on the pontoon, and electrically controlled means for moving said counterweight.

2. The combination with a pontoon and a crane thereon, of a movable counterweight on the pontoon, an electric motor for propelling said counterweight, and means for controlling the operation of said motor.

3. The combination with a pontoon and a crane thereon, of a movable counterweight on the pontoon, an electric motor for propelling said counterweight, and means operative automatically by the tilting of the pontoon for controlling the operation of said electric motor.

4. The combination with a pontoon and a crane thereon, of a movable counterweight on the pontoon, an electric motor for propelling said counterweight, circuit closing means included in circuit with said motor and operative automatically by the tilting of the pontoon, and a reversing switch for reversing the circuit through the motor when the counterweight reaches one end or the other of its travel.

5. The combination with a pontoon and a crane thereon, of a movable counterweight on the pontoon, an electric motor for propelling said counterweight, a pendulum, and a circuit closer included in circuit with said motor and controlled by the swinging of the pendulum.

6. The combination with a pontoon and a crane thereon, of a movable counterweight, an electric motor for propelling said counterweight, a circuit closer comprising two pairs of contacts and a pendulum between the pairs of contacts, and electric circuits including said circuit closer and the motor.

7. The combination with a pontoon and a crane thereon, of a movable counterweight, an electric motor for propelling said counterweight, a multiple contact circuit closer, a pendulum for automatically operating said circuit closer, an electric controller, a reversing switch, and electric circuits including said motor controller, multiple circuit closer and reversing switch.

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

GEORGE HENRY HULETT.

Witnesses:

HERBERT P. GLIDDEN,

H. A. PELOUBET.