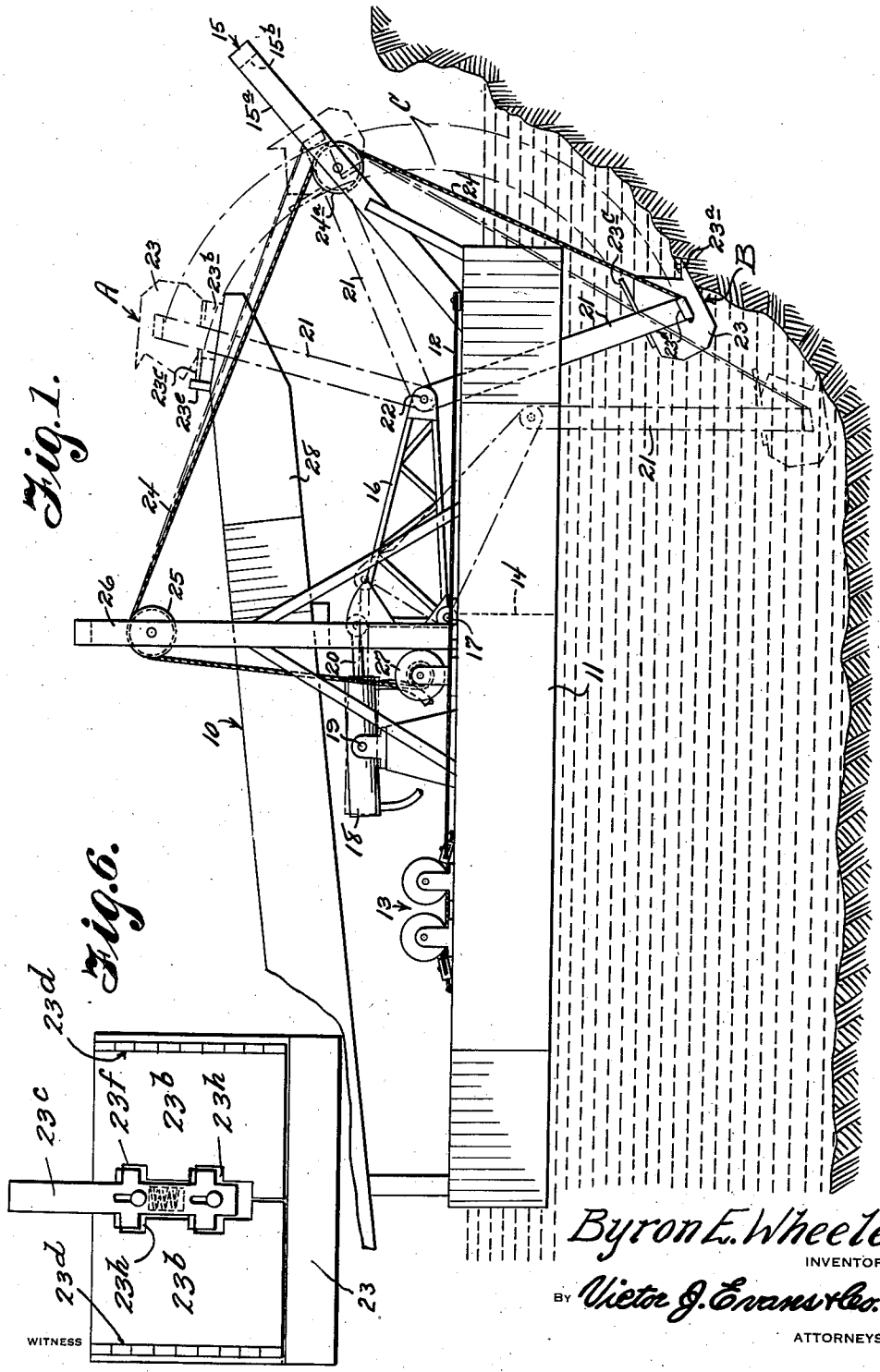
Sept. 2, 1941. B. E. WHEELER 2,254,464

DREDGE

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DREDGE

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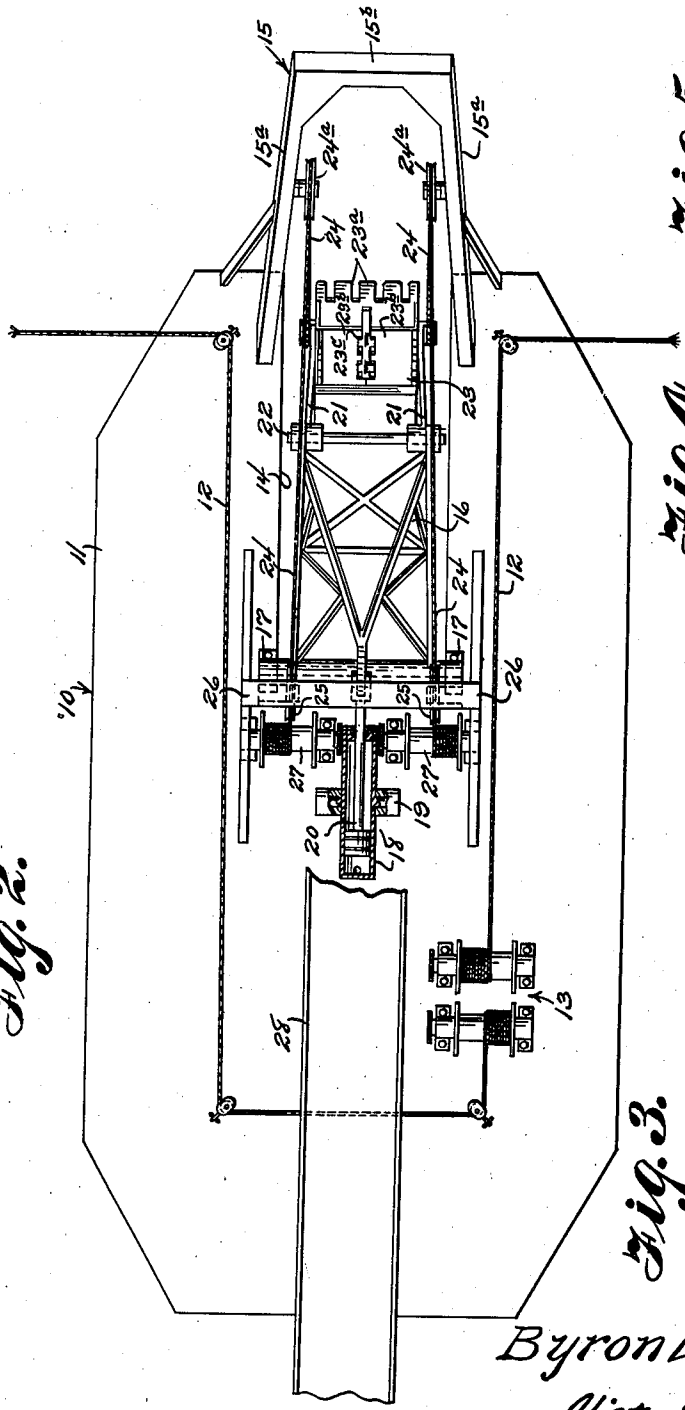


Fig. 2.

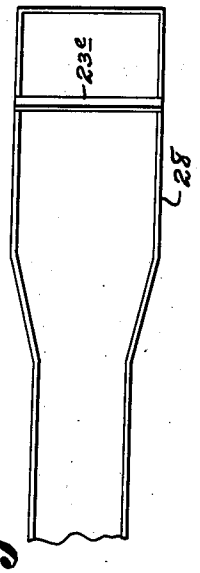


Fig. 3.

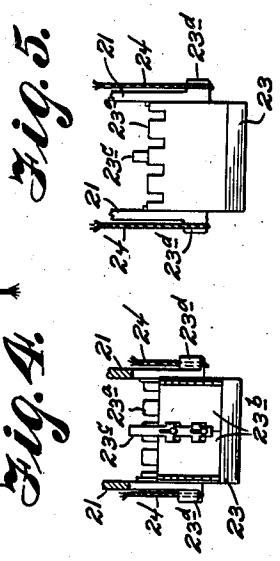


Fig. 4.

Fig. 5.

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WITNESS

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DREDGE

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Application February 6, 1940, Serial No. 317,585

4 Claims. (Cl. 37—71)

This invention relates to improvements in dredges and especially is concerned with new and improved means for mounting a dredging bucket upon a dredge jib whereby facile action of the machine is facilitated.

In most types of dredges now in use it is necessary in unloading the bucket to swing more than one jib. That is to say, if the bucket were carried upon a first jib and its motion is controlled by cables extending from a second jib, it normally is necessary to move both jibs in unloading the bucket if the bucket contents are to be substantially completely removed. This is necessitated by reason of the cables by which the bucket is moved since these cables normally are carried in guideways mounted upon the second jib and, to assure maximum efficiency, the second jib during use occupies a substantially horizontal position whereas, in raising the bucket, the second jib usually occupies an oblique or semi-vertical position.

It is an object of the present invention to provide a novel and improved dredge construction which includes means for permitting the raising of the bucket carrying jib without necessitating movement of the jib or gantry which serves as a support for the bucket cable guides.

Another object of the present invention is to provide a novel type of dredge construction permitting the discharge of effluent by gravity from the rear of the dredge barge as contrasted to common types of dredges which require pumping or other means of artificial transfer for removing effluent after receiving the same from the dredging bucket.

A further object of the present invention is to provide a novel type of dredge including means for easily but quickly and accurately adjusting the arc of sweep of the dredging bucket, thereby facilitating dredging of a pool to a predetermined depth.

An advantage of the novel dredge construction according to this invention over existing types of dredges is that in this instance means are provided for facilitating alignment of operating cables and cable guides whereas heretofore it has been necessary during use of dredges to adjust manually or otherwise perform operations upon the cables to cause them during use to return to or remain in cable guides.

Noteworthy among the features of the novel dredge construction according to the present invention are its simplicity and ruggedness of construction which serve both to reduce the cost of manufacture of the dredge and also to minimize the expense or necessity for repair under conditions of ordinary use.

Other objects, advantages and features of the new and improved dredge according to the present invention will be apparent to those skilled in this art during the course of the following description.

Regarded in certain of its broader aspects a novel dredge according to this invention comprises on a floating base, an outwardly extending rigid gantry extending across the mouth of a wellway formed in the base, a bucket carrying jib swingable within said gantry and into said wellway, cable guides on parts of said gantry nearest the path of movement of the bucket, and lugs connected to operating cables mounted on said portions of the bucket whereby, during swinging of the bucket into raised position, the cables are raised and removed from the guides but, upon return swinging motion of the bucket, the cables are replaced in the guides.

In order to facilitate a fuller and more complete understanding of the present invention a specific embodiment thereof herein illustrated will be hereinafter described, it being clearly understood, however, that the illustrated embodiment, although presently preferred, is provided solely by way of example of the practice of this invention and not by way of limitation thereof except insofar as the invention is recited in the subjoined claims.

Referring then to the drawings,

Figure 1 is substantially a side elevational view of a dredge according to the presently preferred embodiment of this invention showing the dredging bucket in several positions assumed during use,

Fig. 2 is a top plan view partially in section of the device illustrated in Fig. 1, parts being broken away for clearness of illustration,

Fig. 3 is a top plan view of a portion of the sluiceway, and

Figs. 4 and 5 respectively are bottom and top views of the dredging bucket.

Fig. 6 is an enlarged bottom plan view of the dredging bucket, showing the lock for holding the swinging doors closed.

In the accompanying figures of drawing the instantly preferred embodiment of this invention generally designated by the numeral 10 will be seen to comprise a floating base or barge 11 moored by lines 12 operated by winches 13 whereby the position of the barge can be adjusted to suit requirements of the work. A wellway 14

opening on the front end of the barge is provided to increase the scope of movement of the dredging bucket without requiring shifting of the center of gravity of the machine to a precarious position near the barge edge.

A gantry 15 comprising upright frames 15a connected by a cross piece 15b is mounted across the mouth of the wellway 14 and projects outwardly obliquely with respect to the barge substantially as shown. A boom 16 vertically swingably mounted in bearings 17 attached to parts of the barge near the closed end of the wellway 14 is movable by means including a hydraulic motor 18 pivotally mounted in bearings 19 attached to parts of the barge, and connected to the boom by means of a piston rod 20 whereby reciprocation of the piston rod causes oscillation of the boom in a vertical plane.

Jibs 21 freely swingably mounted upon the distal end of the boom 16 by means including a pivot shaft 22 carry on their free ends a dredging bucket 23 which, it will be noticed, is disposed in a manner such that the open end of the bucket is substantially at right angles to the axis of the jibs. One side of the bucket 23 is provided with a serrated edge 23a to facilitate biting of the pool bottom or side and the opposite side of the bucket comprises swinging doors 23b which may be held in closed position by a lock 23c. It will be noticed that the doors during use of the bucket normally form the top side, but when the bucket is inverted for emptying, as will be hereinafter described, the doors form the bottom side. The doors 23b are hinged at 23d to the sides of the bucket and are provided at their inner edges with oppositely arranged cut away portions 23h. The lock 23c is normally outwardly spring held and supported by the bucket. The side edges of the lock are provided with oppositely arranged outwardly extending lugs 23f, which normally engage the outer faces of the doors and hold them in their closed position, as shown in Figure 6. The longitudinal movement of the lock, caused by its engagement with the cross piece 23e, brings the lugs 23f below the cut away portions 23h to allow the doors to swing downwardly. The lugs are beveled in order that the lock will be moved longitudinally by engagement with the cut away portions when the bucket is moved back to its dredging position.

Operating cables 24 connected to the bucket 23 by outwardly projecting lugs 23d mounted on the bucket sides are received in cable guides 24a freely rotatably mounted upon portions of the gantry 15 nearest the path of motion of the bucket 23 in a manner such that, as the bucket 23 carried on the arm 21 is swung about the axis defined by the shaft 22, the cables 24 are raised and removed from the guides 24a when the bucket is moved into raised position and returned to the guides when the bucket is moved into lowered position.

The operating cables 24 are passed over freely rotatable pulleys 25 carried on standards 26 mounted upon the barge or base 11 substantially as shown and the free ends of the cables are attached to winches 27 operated by suitable means (not shown) whereby the bucket 23 may be moved by tensioning or relieving tension in the cables. When the bucket 23 is moved upwardly into raised position generally designated by the reference character A in Fig. 1, the lock 23c engages a cross piece 23e mounted across the open mouth of a sluiceway 28 whereby the doors are unlocked and, swinging under action of gravity, move into opened position. As the bucket 23 is moved downwardly after emptying to occupy the lowered position shown in Fig. 1 and designated by the reference character B, the doors close and lock by action of gravity and the bucket then may be swung through its cycle of motion to fill the same with parts of the pool bottom or sides as the case may be.

As will be apparent from consideration of the accompanying drawings, the boom 16 may be raised or lowered by means of the hydraulic motor 18 whereby the arc of sweep of the bucket can be raised or lowered to suit the requirements and conditions of use. In each instance, however, the course of travel of the bucket is substantially that shown by the dotted lines C in Fig. 1 whereby during a portion of the motion of the bucket the lugs 23d over-ride the cable guides 24a, thereby raising the cables from the guides as has been hereinabove described.

It is to be understood that this invention is capable of extended application and is not confined to the precise illustrated forms nor described construction and, therefore, such changes and modifications may be made therein as do not affect the spirit of the invention nor exceed the scope of the appended claims.

Having thus described the present invention, what it is desired to secure by Letters Patent is:

1. In a dredge construction of the type including a floating base having a dredging wellway therein, the improved means for mounting the dredging bucket which comprises an obliquely outwardly extending gantry mounted on said base across the open end of said wellway; a boom, swingable about a horizontal axis mounted at its proximal end on said base near the closed end of and movable into a position overlying a major portion of said wellway; a jib, mounted on the distal end of said boom, vertically swingable within said gantry into said wellway; a dredging bucket on the free end of said jib; cable guides on parts of said gantry nearest the path of movement of the bucket; operating cables extending over said guides; and outwardly projecting lugs on the sides of said bucket attached to said cables whereby when said bucket is raised through said gantry the cables are raised from the guides and are returned thereto when the bucket is lowered.

2. In a dredge construction, the combination with a support, an obliquely outwardly extending rigid gantry, a boom pivotally mounted on said support, means for raising and lowering said boom, a jib pivotally connected to the outer end of the boom, a dredging bucket rigidly carried by the outer end of the boom and having a swinging dump side, pulleys carried by the gantry, a cable passing over the pulleys and secured to the outer end of the jib, outwardly projecting lugs on the sides of said bucket so that during the raising of the bucket through the gantry the cable will be raised from the pulley and lowered on the pulley during the lowering of the bucket.

3. In a dredge construction, the combination with a support, an outwardly extending rigid gantry, a boom pivotally mounted on said support and swinging through said gantry, means for raising and lowering said boom, a jib pivotally connected to the outer end of the boom, a dredging bucket rigidly carried by the outer end of the boom and having a swinging dump side, pulleys carried by the gantry, a driven cable passing over the pulleys and connected to outwardly extending arms carried by the jib, a con-

veyor above the support, and means carried by the conveyor for releasing the swinging dump side of the bucket.

4. A dredge construction, comprising a support, an obliquely outwardly extending rigid gantry carried thereby, a boom pivotally mounted on said support, a jib pivotally connected to the outer end of the boom and swinging through said gantry, means for raising and lowering the boom, a standard carried by the support, a driven drum carried by the support adjacent the standard, pulleys carried by the standard, cables wound on the drum and passing over the pulleys carried by the standard and over pulleys carried by the gantry and secured to laterally extending arms carried by the jib, a bucket rigidly carried by the outer end of the jib, whereby the winding of the cables on the drum swings the jib on the boom and causes the cables to pass free of the pulley carried by the gantry.

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