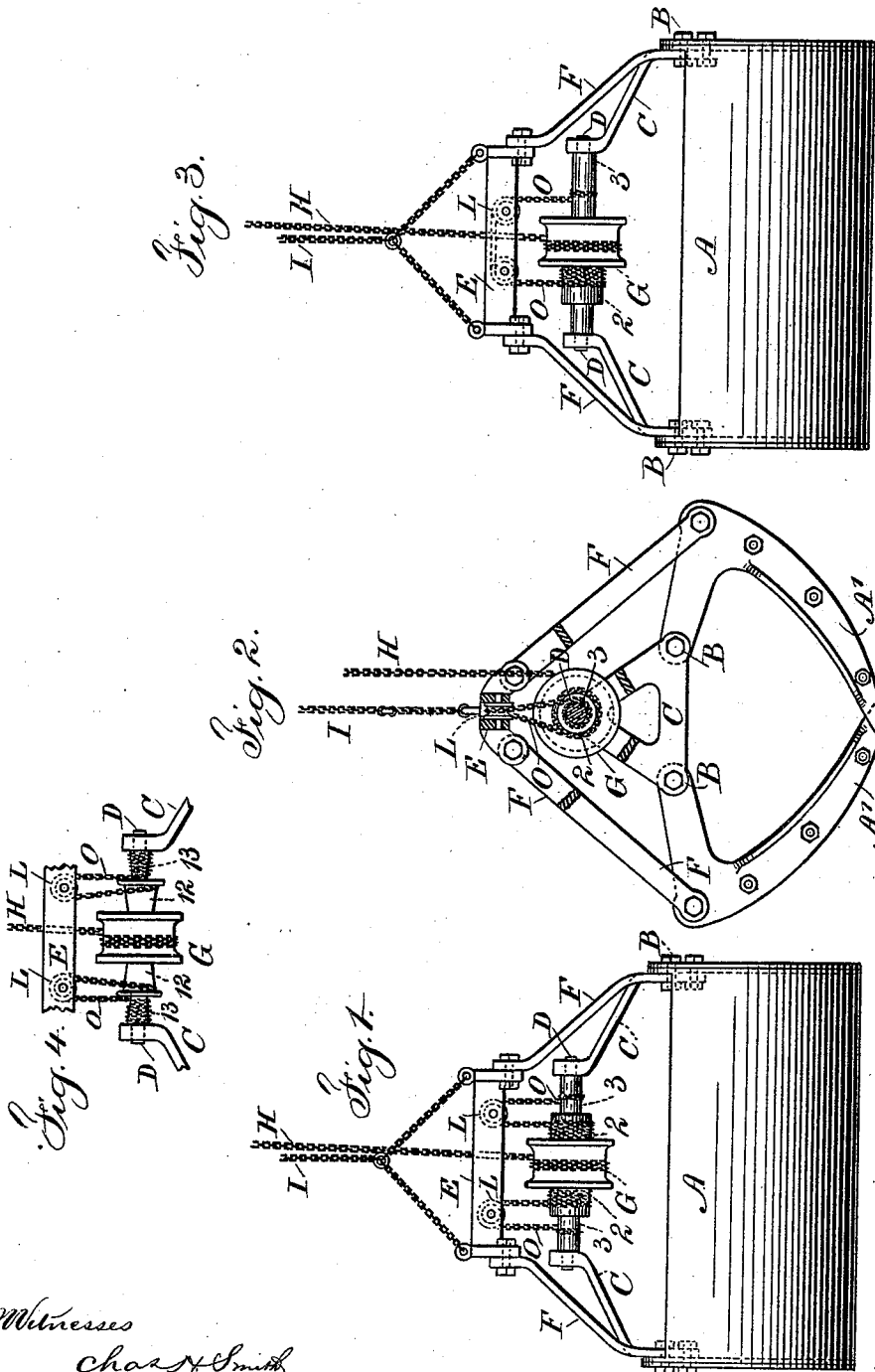


(No Model.)

C. W. HUNT.  
DREDGING OR EXCAVATING APPARATUS.

No. 512,825.

Patented Jan. 16, 1894.



Witnesses

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Att'y.

# UNITED STATES PATENT OFFICE.

CHARLES W. HUNT, OF WEST NEW BRIGHTON, NEW YORK.

## DREDGING OR EXCAVATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 512,825, dated January 16, 1894.

Application filed May 22, 1893. Serial No. 475,023. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. HUNT, a citizen of the United States, residing at West New Brighton, in the county of Richmond and State of New York, have invented an Improvement in Dredging or Excavating Apparatus, of which the following is a specification.

Numerous excavating devices have heretofore been constructed in which segmental buckets have been fitted to open and close by the action of the hoisting ropes or chains. These buckets or excavating devices have usually been designated as "clam-shell buckets," and in many instances these excavators have been provided with strong teeth or claws by which to grasp and either break or pull up woodwork, sunken vessels, piles, &c.

My present improvements are adapted to use with grappling or dredging buckets of the character before intimated. In dredging and excavating devices of this character difficulty has been experienced in closing the scoops or buckets with sufficient power without the use of such large drums or pulleys as to interfere with the convenient use of the buckets and without occupying too much space above the buckets themselves.

The object of the present invention is to obtain the necessary leverage or power for closing the buckets or grapples by the use of a small pulley or drum upon which the hoisting rope or chain acts, and by my present improvement the relative speed of movement of the hoisting chain to the closing of the buckets or grapples can be varied without changing the diameter of the drum upon which the hoisting chain is wound.

In carrying out my improvement I provide a drum or pulley upon which the hoisting chain is wound and by which such drum or pulley is rotated previous to the elevation of the bucket or grapple, and I apply a differential chain connection between the devices that close the bucket and the hoisting drum, there being chain drums of different sizes, so that the bucket is opened or closed by winding the chain off one drum and upon the other, and according to the power required so the drum will be revolved a greater or less number of times to act through the differential chain connections upon the bucket itself; and by

varying the sizes of the barrels upon which the differential chains are wound and unwound, the power exerted in closing the buckets or grapples can be regulated.

In the drawings, Figure 1 is an elevation of my improved apparatus. Fig. 2 is a partial cross section illustrating the improvement as applied to a grapple, and Figs. 3 and 4 illustrate modifications in the differential drums.

The scoops A are represented as sections of a cylinder with closed ends that are pivoted at B upon the frame C that supports the main shaft D, and the head-block E is provided with links F that extend to and are pivoted upon the outer angles of the scoops or grapples. It is to be understood that these parts are illustrative of any bucket or grapple of this general character, and that these parts are to be varied as desired; and that the present improvement is available with buckets that are formed in two sections or the same may be used with grapples or buckets formed of four or more sections; and that in place of the scoops, teeth or other devices may be employed according to the nature of the excavating or dredging apparatus.

In Fig. 2 the teeth A' are represented in place of the scoops or buckets A in Fig. 1.

Upon the main shaft D is a pulley or barrel G to which one end of the hoisting chain H is permanently fastened and to the head-block E the lowering chain I is attached, and between the shaft D and the head-block E differential chain mechanism is applied having chain barrels or wheels of different sizes. I have represented the barrels 2 and 3 as formed with or applied to the shaft D, and these barrels are of different sizes and the chains O pass over the pulleys or sheaves L in the head-block E, and the ends of said chains O are wound in opposite directions around the respective barrels 2 and 3 and attached thereto at their ends.

It is now to be understood that when the excavating apparatus is lowered by the chain I, the weight of the apparatus hanging by the links F from the head-block E opens the scoop or excavator and hence the excavator is in a condition for use as it is lowered, and while resting upon the rock or sand, piles, woodwork or other material to be excavated,

the hoisting chain H is drawn upon and the barrel G rotated, and according to the relative sizes of the barrels 2 and 3 so that the shaft D and barrels will have to be rotated a greater or less number of times to shorten the distance between the main shaft D and the head-block E by the differential barrels taking up the chains O and thereby the scoop, bucket or excavator will be closed with a very powerful action to grasp and seize or cut into the material to be excavated or raised; and when the bucket is full or has a firm hold upon the article or material to be raised, a continuance of the pull upon the hoisting chain H raises the bucket and materials therein, or held thereby, while being transferred to the place of delivery and the bucket is opened by drawing upon the chain I which lifts the head-block E, causing the weight of the bucket and the materials held by it, to act through the differential chains O to rotate the main shaft D, barrels, G, 2 and 3 in the opposite direction to that in closing the bucket, thereby winding the slack hoisting chain H upon the barrel G and unwinding the chains O from the larger barrels 2 upon the smaller barrels 3.

I do not limit myself to the relative arrangements of the parts hereinbefore described, as they may be varied according to the character of the bucket, and I do not limit myself to the particular construction of the differential chain gearing, as the barrels may be made conical or tapering, as shown at 12 and 13, Fig. 4, so that the most rapid movement will be given to the parts when the scoops or teeth are first moved toward each other, and a slower more powerful motion will be given in the final closing in consequence of the barrels 12 and 13 upon which the chain lies during such closing movement being more nearly of the same diameter.

Instead of using two pairs of barrels, as in Figs. 1 and 4, a single pair of barrels and one chain may be used, as in Fig. 3.

I claim as my invention—

1. The combination with the scoops or teeth, and the frame and pivotal connections, of three barrels of different sizes and a shaft or axis for the same revolving together, a hoisting chain connected to the largest barrel and by which the barrels are revolved, and a chain extending between the other two barrels and acting to close the apparatus as the barrels are revolved, substantially as specified.

2. The combination with the head-block, scoops or teeth and the pivoted connections, of a main shaft, a chain barrel upon such shaft, a hoisting chain passing around said barrel, differential chain barrels upon the main shaft, chains therewith connected and pulleys upon the head-block over which the differential chains pass, substantially as set forth.

3. The combination with the scoops or teeth, of a frame, head-block and pivotal connections between the respective parts, a shaft supported by the frame and having a chain barrel, a hoisting chain passing around said barrel, differential chain barrels, and a chain passing around such differential barrels, and pulleys upon which such differential chain acts in closing the scoops or teeth by the rotation of the barrels as acted upon by the hoisting chain, substantially as set forth.

4. The combination with the scoops or teeth, of a rigid frame to which the scoops are pivoted, a head block and connections from the same to the scoop, three barrels of different sizes and an axis or shaft for the same supported by the rigid frame, a chain attached to the largest barrel for rotating the same and for hoisting the apparatus, and a chain between the other two barrels and acting to close the apparatus as the drums are revolved, substantially as specified.

Signed by me this 16th day of May, 1893.

CHAS. W. HUNT.

Witnesses:

HAROLD SERRELL,  
A. M. OLIVER.