

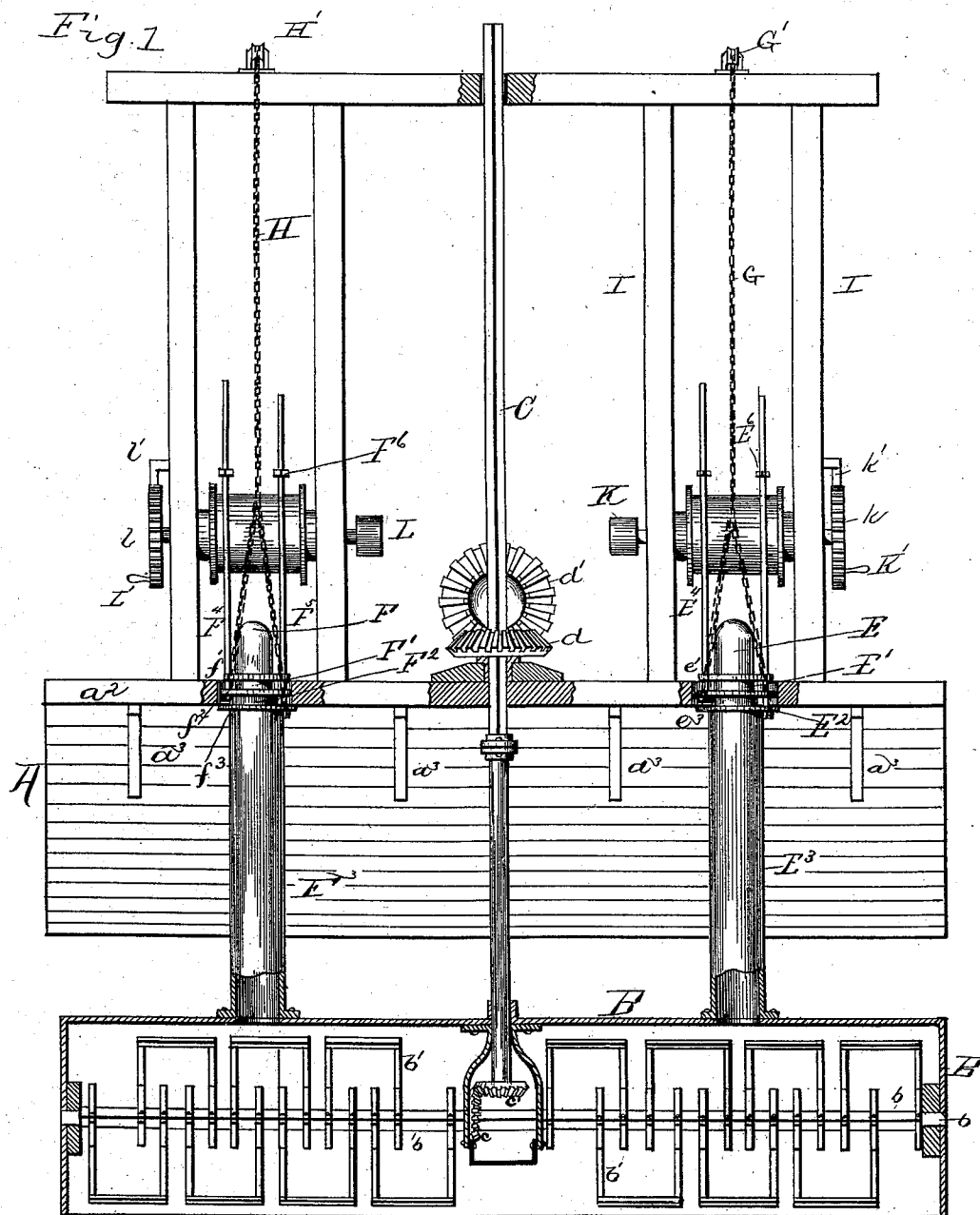
(No Model.)

3 Sheets—Sheet 1.

J. McFARLANE.
HYDRAULIC DREDGING MACHINE.

No. 401,896.

Patented Apr. 23, 1889.



Witnesses.

F. R. Cornwall,
Chas. J. Stockman.

Inventor.

John McFarlane.
By *W. H. Attorney*
S. B. Brashear.

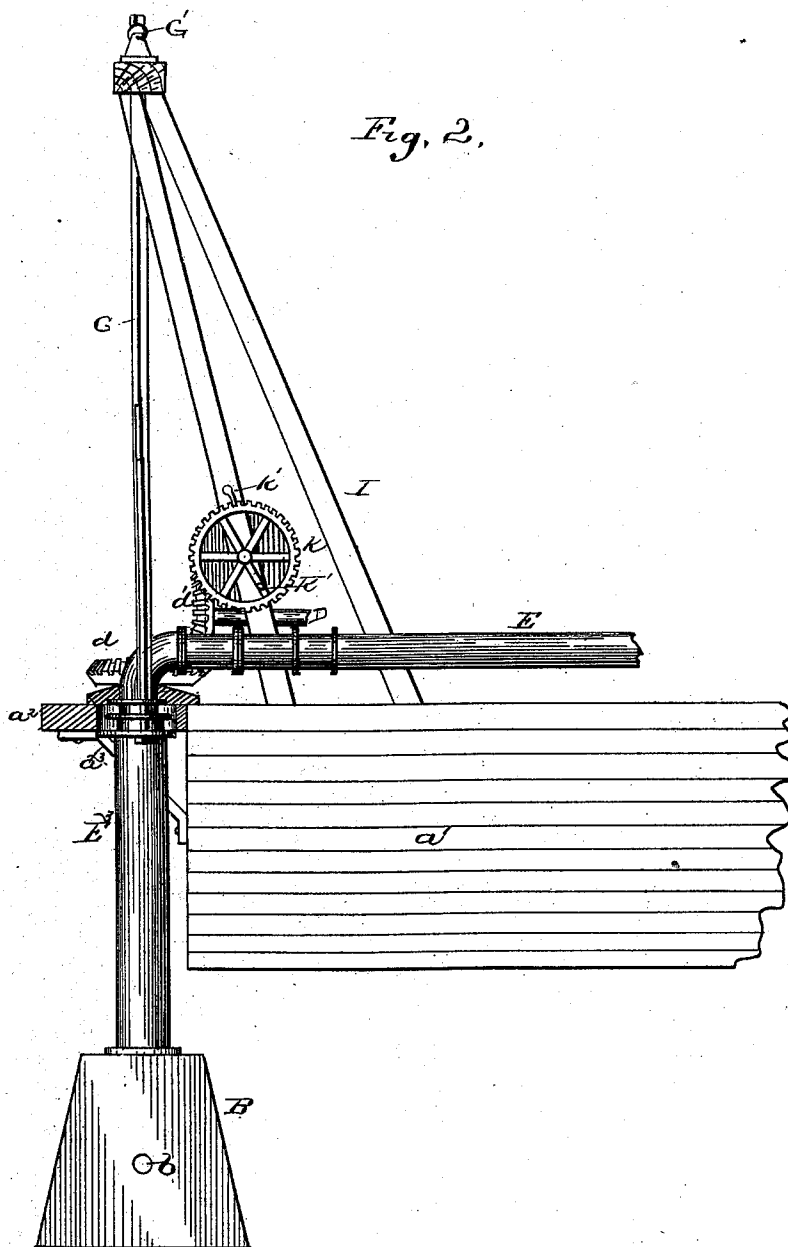
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Chas. J. Stockman

Inventor,

John McFarlane

By his Attorney

S. A. Brashers

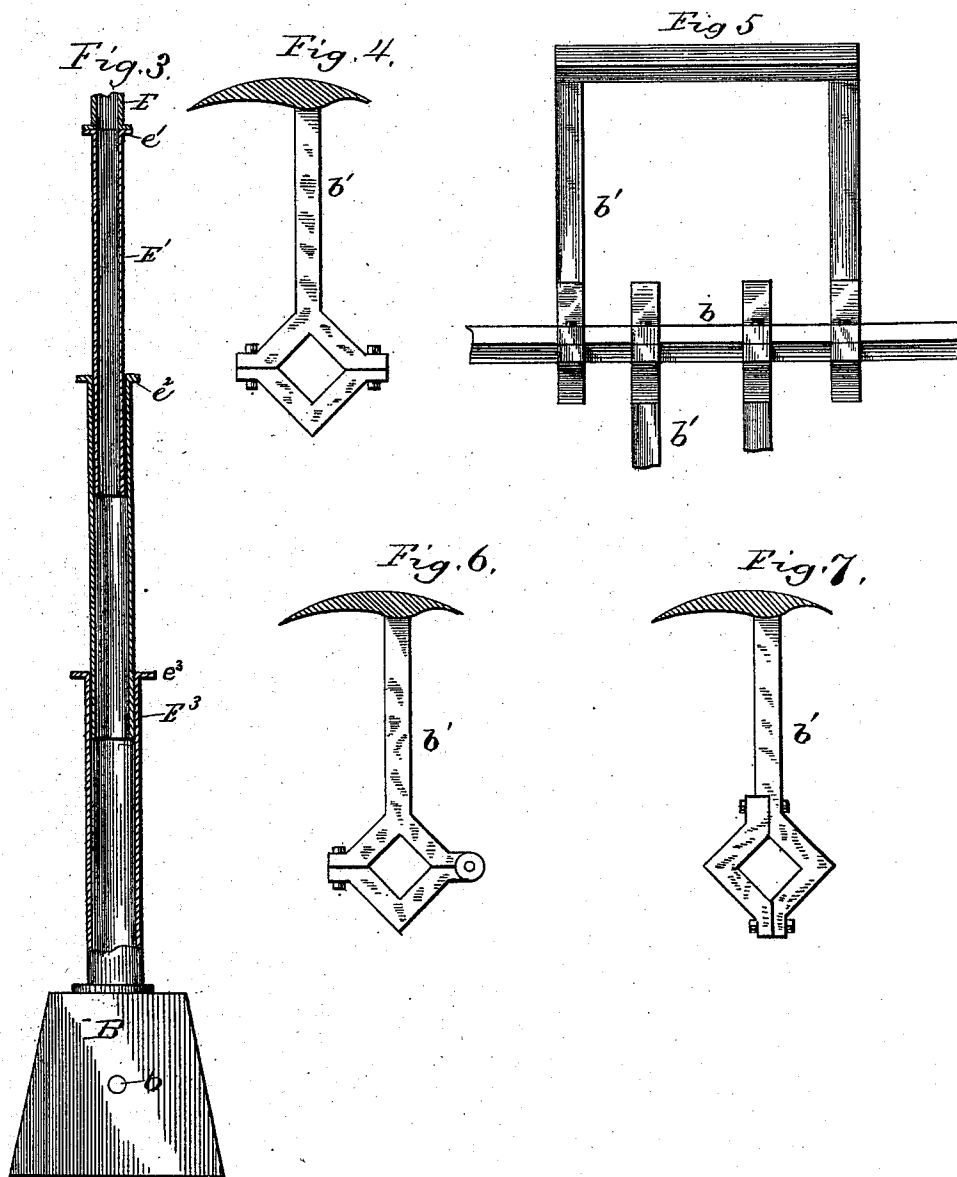
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UNITED STATES PATENT OFFICE.

JOHN MCFARLANE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR,
BY DIRECT AND MESNE ASSIGNMENTS, OF PART TO GEORGE J. BESSLER
AND HENRY WEX, OF SAME PLACE.

HYDRAULIC DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 401,896, dated April 23, 1889.

Application filed April 6, 1888. Serial No. 269,891. (No model.)

To all whom it may concern:

Be it known that I, JOHN MCFARLANE, a subject of the Queen of Great Britain, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Hydraulic Dredging-Machines; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to hydraulic dredges, and has for its object to improve the effectiveness, simplify the construction, cheapen the cost, and economize the power and fuel used in running such machines.

With these objects in view my invention consists in the improved construction, arrangement, and combination of parts hereinafter fully described, and afterward specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in end elevation of a dredge having my improvements applied thereto. Fig. 2 is a side view of the parts shown in Fig. 1. Fig. 3 is a longitudinal vertical sectional view showing the manner of connecting and controlling the movement of the telescope-tubes. Fig. 4 is a vertical section through one of the cutters. Fig. 5 is an enlarged view of part of the cutter-shaft, showing the manner of attaching the cutters thereto. Fig. 6 is a view similar to that shown in Fig. 4, showing a modification thereof; and Fig. 7 is a view of another modification.

Like letters mark the same parts whenever they occur in the several figures of the drawings.

Referring to the drawings by letters of reference, A is an ordinary hull of a dredge, *a* being the end, and *a'* the side thereof, the former shown in Fig. 1 and the latter in Fig. 2. The deck *a*² is projected forward, (see Fig. 2,) and is supported by suitable braces, *a*³. (See Figs. 1 and 2.)

B is a sheet or metal box extending along the front of the hull of the dredge, and is of the length of the width of the hull. This box

is lowered into the water and rests on the bottom or earth, the bottom of the box being open. In this box is journaled a shaft, *b*, extending athwart the hull and longitudinally of the box, having secured to it a series of knives or stirrers, *b'*, said shaft being driven by means of suitable gear-wheels, *c c' d d'*, an upright sliding shaft, C, and a suitable horizontal shaft, D, said shaft D being driven by any suitable power on board the dredge. This box B has extending from it two pipes, E F, connecting with the usual centrifugal pump on the dredge. These pipes, in order to accommodate the different depths of water and still preserve a proper connection with the box B, are each formed with two or more (in this instance of three) telescoping sections, E' E² E³ and F' F² F³, the outer sections, E³ and F³, being connected to the box B, and inner sections forming part of the main pipes E F. Each of these sections is provided at its top with a flange marked, respectively, *e' e² e³* and *f' f² f³*.

To the flanges *e² f²* on sections E² F² are secured rods E⁴ F⁴, which extend upward through the holes in the flanges *e' f'* on sections E' F', and to flanges *e³ f³* are secured upwardly-extending rods E⁵ F⁵, passing through holes in flanges *e² f²* in a similar manner. These rods are threaded a part of their lengths, and are provided with nuts E⁶ F⁶ to limit the outward adjustment of the several telescopic sections; or, instead of threading the rods they may be made smooth, and unthreaded nuts having set-screws to bear against the rod may be used. To the flanges *e³ f³* of the outer telescopic sections are attached chains G H, which mounted over pulleys G' H', mounted at the top of a suitable frame-work, I, raised on the deck of the dredge, pass down and are connected to drums *g h*, whose shafts are provided on the end with a belt-pulley, K L, whereby they may be driven from the power of the dredge, and on the other end with cranks K' L', whereby they may be turned by hand. They are further provided with ratchet-wheels *k l* and pawls *k' l'*, as shown.

The operation of my invention may be described as follows: The dredge being in position, the box B is lowered by means of the

chains and pulleys, the cutter-shaft is revolved, causing the cutters to plow, cut, or stir up the bottom, and the pumps being started the mixture of sand or mud and water is carried up through the pipes and delivered therefrom at any desired point. The box gradually lowers until the proper depth is dredged, when it may be raised and moved into another position to repeat the operation. This may be done also without raising by leaving the front of the box open and pushing it forward into the bank. A large surface can thus be dredged over before it is necessary to move, the box being, as before stated, of a length equal or perhaps greater than the width of the dredge.

There may, if desired, be two parallel shafts in the box, each carrying the cutters, thus about doubling the capacity in each position of the dredge, and allowing of the movement of twice as much earth before moving the dredge to another position.

I have not shown the various ways that the parts herein described may be connected with the power (usually steam-engines) on the dredge, as many variations might be made in such connections without in any way affecting my invention, such changes suggesting themselves to the machinist or engineer according to the necessities of each particular case.

In the views of modifications of means of attachment of the cutters to the shaft, Figs. 4, 6, and 7, it will be seen that the cutters are rigidly held thereon by simple means, and may be removed or adjusted in position with great facility. In Fig. 4 a lower piece is secured to the main body by two bolts passing through a flange on each side. In Fig. 7 two bolts are also used, but differently arranged; but in Fig. 6 only one bolt is used, a hinge being used instead of the other bolt shown in Fig. 4.

It will be observed that the cutter-blades are not arranged in the arc of a circle which has the axis of rotation of the shaft as a center; but the center of their arcs is without the shaft to the left thereof, as shown in Figs. 4, 6, and 7, so that the cutters while cutting the earth at the same time act as plows and throw the dirt inward and upward, causing its thorough intermixture with the water.

Openings are made in the box or case, which may be regulated by valves, so that water will be admitted, and all tendency to form a vacuum be relieved.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a hydraulic dredge, a box or case, telescopic suction-pipes leading therefrom, and a shaft journaled horizontally within said box or case, in combination with alternating cutters bolted to said shaft and adapted to rotate in a vertical plane, each of said cutters having its center beyond the axis of rotation of the shaft, as and for the purposes set forth.

2. In a dredging-machine, the combination, with a vertically-movable box, a shaft journaled horizontally therein, and cutters on said shaft, of telescopic suction-pipes, each of the sections of which is provided with a projection, guiding and controlling rods on either side of each of said pipes, one of which rods is bolted to the projection of the intermediate section of the pipe and passes through the projection on the upper section thereof, and the other of which rods is secured to the projection on the bottom section of the pipe and passes through the projection on the intermediate section thereof, all substantially as and for the purposes set forth.

3. In a dredging-machine, a vertically-movable box or case, a shaft journaled horizontally therein, and alternating cutters secured on either side of said shaft, the blades of which are curved in the arcs of circles whose centers fall without the axis of rotation of said shaft, in combination with telescopic suction-pipes each of the sections of which is formed with a projection at its upper end, guiding and controlling rods on opposite sides of said suction-pipes, and respectively secured to different sections thereof, means for raising and lowering the box or case, and means for operating the shaft carrying the cutters, all substantially as and for the purposes set forth.

4. In a dredging-machine, a cutter the extremity of the shank of which is formed with projections extending obliquely in opposite directions, and one of which has a perforated lip, and a correspondingly-shaped piece hinged to one of said projections, whereby a rectangular opening will be formed, as shown, and also having a perforated lip, and a bolt passing through said lips, for the purpose set forth, in combination with a horizontal shaft passing through the rectangular opening of the cutter.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN MCFARLANE.

Witnesses:

SHIPLEY BRASHEARS,
FRED R. CORNWALL.