

(No Model.)

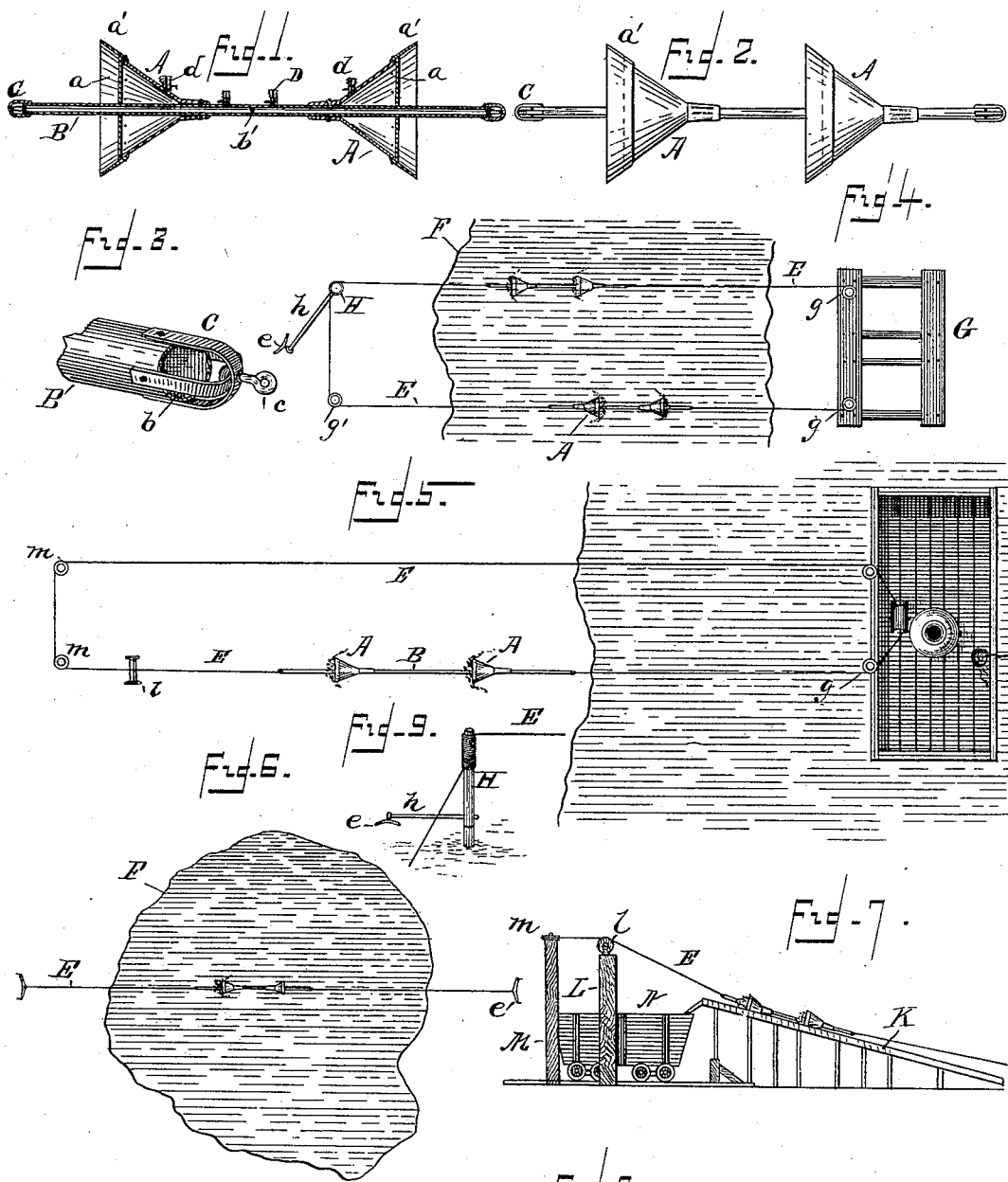
2 Sheets—Sheet 1.

M. A. SHEPARD.

DREDGING AND EXCAVATING MACHINE.

No. 364,780.

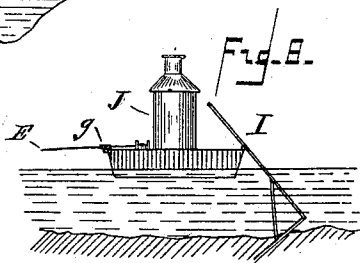
Patented June 14, 1887.



WITNESSES.

H. D. Kealy.

W. S. Penfield



INVENTOR.

Morrill A. Shepard

By his attorney,

W. H. Fock

(No Model.)

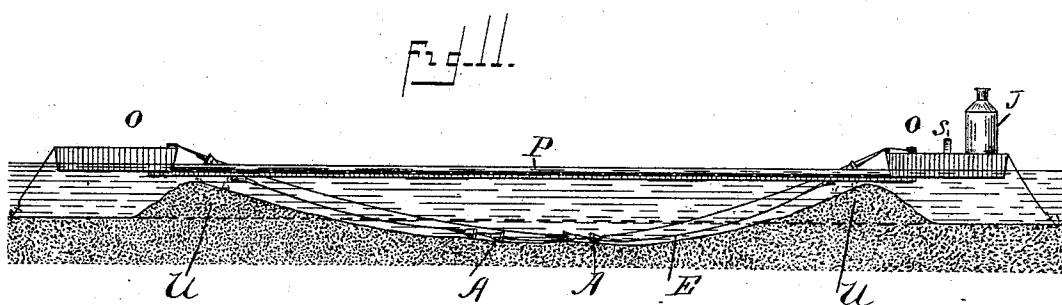
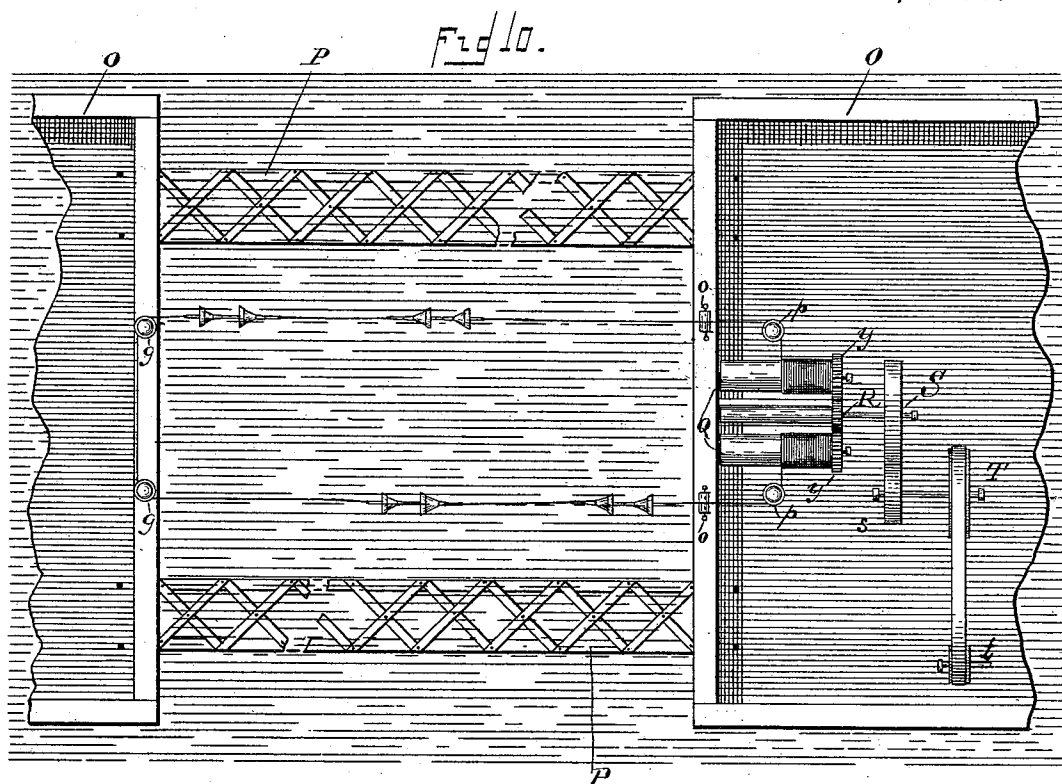
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UNITED STATES PATENT OFFICE.

MORRILL A. SHEPARD, OF LEBANON, ILLINOIS.

DREDGING AND EXCAVATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 364,780, dated June 14, 1887.

Application filed February 18, 1887. Serial No. 238,080. (No model.)

To all whom it may concern:

Be it known that I, MORRILL A. SHEPARD, a citizen of the United States, residing at Lebanon, in the county of St. Clair and State of Illinois, have invented certain new and useful Improvements in Dredging and Excavating Machines; 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, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to that class of machines used for dredging or excavating; and the object is to provide a device for ditching in wet and low marshy lands and for removing muck deposits from swamps, lakes, and beds of streams to the shore, to be used for fertilizing and other purposes, by which an alternate movement of a cable will operate to load the deposit-excavators when moving in either direction, back or forth; and my invention consists in the construction hereinafter described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a sectional view of my invention. Fig. 2 is a plan view with the excavators turned in the same directions. Fig. 3 is a perspective view of one end of my shaft, showing a swivel-joint for attaching the power. Fig. 4 is a plan view of my invention secured to a pulley-frame on the shore, in operation. Fig. 5 is a view of my invention, one end of which is attached to a boat anchored in the water and the other end on land. Fig. 6 is a plan view of the device drawn at each end on the land, with the dredgers in the water. Fig. 7 is a part sectional and side view showing the land end of the apparatus of Fig. 5. Fig. 8 is a plan view of a part of Fig. 5, showing the boat anchored in the water. Fig. 9 illustrates the winding-post and lever-arm of Fig. 4 for moving the cable. Fig. 10 is a plan view of my device secured to the sides of two boats anchored in the water and arranged to operate between them. Fig. 11 is a side view of the same, showing the excavators in operation.

Like letters of reference refer to corresponding parts in each figure of the drawings.

In the construction of my device I form ex-

cavators of a conical shape and secure them to a shaft facing in the same or in opposite directions, and adapted to be drawn in alternate directions on the bed of the stream, river, or lake, or upon land, so that they will be loaded in each of their movements back and forth and deposit the muck or dirt at the sides.

A represents a conical-shaped excavator, made of iron or other suitable material, having a diaphragm, *a*, secured on its inner side near its largest end, forming an air-chamber within. Around the periphery of the flaring or large end of the excavator there is placed a hard iron or steel flaring band, *a'*, with a dull cutting-edge extending outward. The body of the excavator may be made of wood staves, if desired, and be provided with an iron band at the small end of the cone to securely hold it around the shaft, and also with the band *a'* around its largest end. Through the center of the excavators there is placed a hollow shaft, B, of iron or steel, and to this shaft the excavators are securely and rigidly fastened in any desired suitable number and position adapting them for the character of work to be done. The outer ends of the shafts are closed by a screw plug or cap, *b*, and to their outer sides there are fastened stirrups C, crossing each other, in which a swivel, *c*, is placed, having an eye for the attachment of a draft-cable, to enable the excavators to roll to one side when they come in contact with an obstruction without twisting the draft-cable. The hollow shaft B is divided internally at its central point, *b'*, by a partition extending across the bore, to form air-chambers, and between the excavators A there is inserted in the sides of the shaft screw-caps or faucets D, which are screw-threaded on their outer ends to receive a cap or hose and communicate with the inner chambers of the shaft B. These faucets are used for filling the chambers with water through a hose or otherwise, or in employing them, as the case may be, for the purpose of weighting one or both ends of the shaft when it is desired to regulate the pressure of the excavator, depending upon the degree of hardness of the deposit to be removed.

Faucets or screw-caps *d* may be secured to the sides of the conical excavator, communicating with the inner chamber, which may

also be filled with water to serve as a weight, or emptied, so as to form an air-tight chamber for a float.

The conical excavators A may be secured to the hollow shaft B, to suit the convenience of the character of work to be done. Where it is desired to work the excavator in a gravel or hard bed in the bottom of a stream or river to excavate the matter from the center to each side, I usually arrange two of the excavators on the shaft, facing in opposite directions, as shown in Figs. 1 and 6, and attach a cable, E, to the swivel *c* in the end of the shaft, and on each end of the cable there is secured a whiffletree, *e* adapting the device to be operated by a horse in hauling the deposit to first the one side and then to the other of the water F.

In soft mucky deposits in the beds of streams I usually operate my excavators A upon two lines of a continuous cable, there being two or more excavators, if desired, facing in the same directions on each line, arranged in the form of a rectangle over pulleys, as shown in Fig. 4, in which case an anchor-frame, G, having pulleys *g*, is secured to the ground on one bank of the stream, while on the other bank there is a pulley, *g'*, and a winding-post, H, having a lever-arm, *h*, to which a horse may be attached to haul the double-loaded excavators in opposite directions at the same time, the winding-post H receiving one portion of the cable E at the same time it dispenses the other portion.

Where it is desired to remove deposits from the beds of wide streams or lakes for fertilizing purposes, a boat, I, may be anchored at any convenient distance from the shore, as shown in Figs. 5 and 8, and the cable E, carrying one or more excavators on one or both of its lines, may be operated by steam-power J on the boat to haul the deposits to the shore, where it may be run up on an incline, K, by means of the elevated roller *l* on the post L and the pulleys *m* on the posts M, and dumped into the truck N, ready to be hauled away for distribution.

In cases where it is desired to cut a channel in the center of wide rivers or in lakes for the passage of deep-draft steamers, two boats, O, are arranged at a distance apart somewhat wider than the channel is to be cut, and are secured together at or near their sides by rigid braces P, as shown in Figs. 10 and 11. Two or more of the excavators A are arranged on the shafts and attached to the cable E, so as to haul the deposit to each side of the channel on both lines of the cable, which operates over pulleys *g* on one of the boats or land anchors, as hereinbefore described. On the other boat rollers *o* are secured to the edge over which the cable passes to pulleys *p*, around which the cable is drawn and wound at each end upon parallel rollers Q. These rollers are provided with gear-wheels *q* at one end, which are operated by a pinion, R, on a

shaft between them, turning one in one direction and the other in the other direction by means of friction-wheels S s, attached to band-wheels T t, operated by steam-power J on the boat, drawing the two lines of cable in opposite directions between the boats at the same time, thereby scooping out a channel and heaping the deposit U in a pile near the edge of the boat.

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

1. The combination, with a shaft, of a conical excavator having the shaft secured in the center thereof and adapted to be filled by the movements of the shaft, as and for the purpose set forth.

2. The combination, with a shaft, of conical excavators secured thereto, provided with a band having a cutting edge around their flaring ends, said excavators being adapted to be filled and emptied in their movements back and forth, as and for the purpose described.

3. The combination, with a hollow shaft divided internally by a partition, forming separate chambers adapted to be weighted or to serve as air-chambers, of excavators secured thereto for hauling the deposit as the shaft is moved back and forth, as and for the purpose described.

4. In an excavator, the combination, with a shaft provided with air-tight chambers therein, provided with faucets and with swivels at the ends of the shaft for the attachment of a cable, of conical excavators secured to the shaft, as and for the purpose set forth.

5. In a dredge or excavator, the combination, with a shaft having air-chambers therein, provided with faucets, of conical excavators having diaphragms within their enlarged ends, forming air-chambers within, provided with faucets, said excavators being secured to the shaft, as and for the purpose set forth.

6. In a dredge, in combination, a shaft having conical excavators secured thereto, said shaft being attached to a cable working over pulleys on boats, said boats being separated from each other and secured together by rigid braces, and the excavators working between the boats, as and for the purpose set forth.

7. In a dredge, the combination, with a hollow shaft provided with conical excavators having air-tight chambers therein, with a band having a cutting-edge on their enlarged ends, of a cable secured to the ends of the shaft working over pulleys on boats separated from each other, said boats being secured together by rigid braces and the excavators working between them, as and for the purposes set forth.

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

MORRILL A. SHEPARD.

Witnesses:

H. D. NEALY,
M. HUBBEL.