J. Callaghan.

Dredging Machine.

No. 6,029. Patented Jan. 16, 1849.

Fig. 1

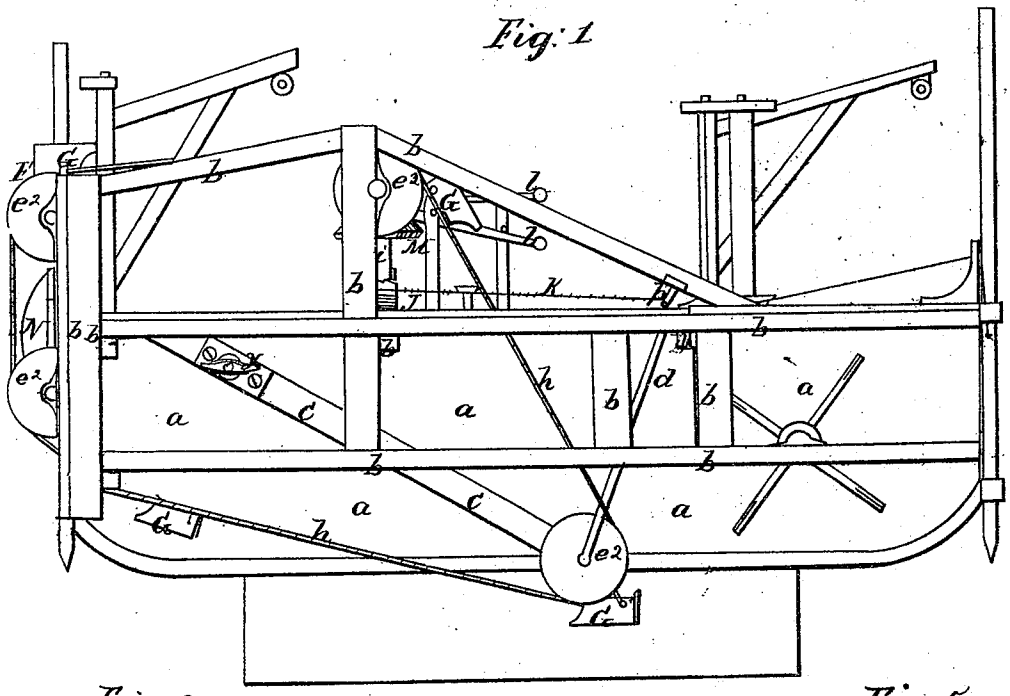


Fig. 2.

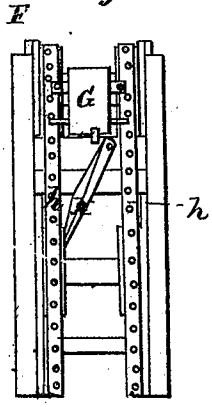


Fig. 3.

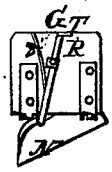


Fig. 4.

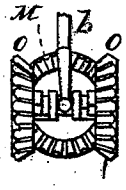


Fig. 5

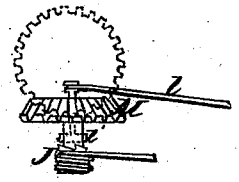
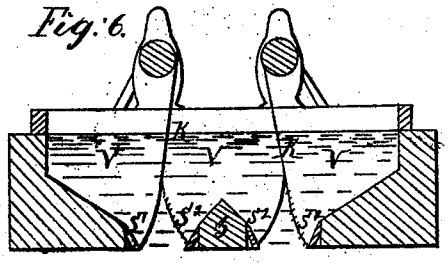


Fig. 6.



UNITED STATES PATENT OFFICE.

JAMES CALLAGHAN, OF NEW BEDFORD, MASSACHUSETTS.

METHOD OF DIRECTING THE SCOOPS IN DREDGING MACHINES.

Specification of Letters Patent No. 6,029, dated January 16, 1849.

To all whom it may concern:

Be it known that I, JAMES CALLAGHAN, of New Bedford, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Machinery for Excavating or Dredging and Removing Obstructions to Navigation in Rivers, Harbors, &c.; and I hereby do declare that the following is a full, clear, and exact description.

The nature of my invention consists, 1st, in providing suspension movable braces or levers, united by an axle on which are fixed two grooved sheaves or pulleys over which revolving scooping buckets pass on two endless chains; and in conjunction with the said suspension braces I provide a vertical sliding frame attached to the bow of the dredge boat, as the case may be, and to have grooved sheaves or pulleys on said sliding frame over which the scooping buckets also pass on the duplicate endless chains, for the purpose of scooping, (excavating) at any angle, and at any desired depth, by having the suspension braces fixed on the side of the dredge boat, and kept in such a relative position with the sliding frame as will keep the scooping buckets moving in a horizontal line, or scooping at any angle; 2nd, I provide scooping buckets with bottoms capable of being thrown open by a cam fixed on the vertical sliding frame, so that the mud &c., may be discharged from the buckets at that part of the frame on which the cam is fixed; 3rd, I also provide a capstan drum to surround an upright power shaft loose on the same, but made to gear with it by a clutch. Around this drum are wound chains which are attached to the suspension levers, and also to the vertical sliding frame, so that when the levers, or frame mentioned, are to be elevated, or lowered, the said capstan drum is clutched with the power shaft, and the chain, or chains wound up, or let off, and the levers, or frame elevated or lowered, to change the line of draft of the scooping buckets; 4th, I provide scows or tenders into which the mud &c., is to be discharged, and provide said tenders with discharge ports of such depth as will allow said scows or tenders to discharge their mud in any depth of water, and especially in shallow water or streams, where the tender may get aground, so that the mud may be discharged without waiting for the tide to lift the tender as is the case with all mud tenders at present in use.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, reference being had to the accompanying drawings, making a part of this specification in which—

Figure 1, is a side elevation, Fig. 2, the vertical sliding frame, Fig. 3, the bottom, spring and catch of the bucket, Fig. 4, a vertical view of the mode of clutching or gearing the horizontal shaft which drives the chains and buckets, with a vertical shaft connected with the crank shaft of the engine. Fig. 5, is a view of the capstan drum, showing how it may be geared or ungeared with the vertical shaft, and Fig. 6 is an end section of the mud tender, exhibiting the discharge ports open.

The same letters indicate like parts on all the figures.

(*a*) represents the hull of the boat, (an old steamboat will answer the purpose.)

(*b*) represents the timbers of a frame attached to the side of the boat to support the suspension levers and the pulleys. This frame has its longitudinal timbers very strong, from eighteen to twenty four inches in thickness, and the posts or upright timbers are about two feet six inches in thickness. The length and height of this frame depend on the size of the boat. A space of about six feet is allowed from the outside of the frame to the side of the boat, to allow the buckets to move, as it were, over the middle of the frame at the side of the boat, therefore the timbers (*b*) of the said frame are duplicated with a space between for the buckets to move.

(*c*) is a suspension lever. It is a strong piece of timber nearly two thirds the length of the boat, in length. It is attached to the side of the boat by a strong set screw X, to allow the said brace to be moved up and down when desired. (*d*) is another suspension lever having two arms like the prongs of a fork—each arm supports an axle at its lower extremity, which is the axis of a grooved pulley (*e'*), therefore the arm (*d*,) is duplicated and (*e'*) is duplicated directly opposite one another. (*c*) is braced on the middle of the pulley's axis. There are eight

grooved face pulleys on the frame (e') (e^2 e^2) and (e^3). One pair is fixed on each axis and the buckets move in the space between or middle of the pairs. (e^2) are attached on the vertical sliding frame.

F, is the vertical sliding frame. It is attached to the bow of the boat by having its sides tennoned to slide in grooves which are made in the upright standards (b, b) of the frame (which is firmly secured to the boat.) The vertical sliding frame F, is for regulating the angular cut of (G) the scooping buckets, by shifting the said frame up or down as the case may be.

The buckets (G), are fixed upon two or a double endless chain (h). One chain is attached to one side of the bucket and the other chain to the other side of the bucket, so that the bucket is supported between the two chains and swings a little in this position, so that when the bucket is ascending the vertical sliding frame filled with mud, it (the bucket) juts inward a little, bearing upon a cam N, which throws the spring of the bottom of the bucket out of its catch, and the door then flies open and the mud is discharged out of the bucket. The double chains move in the grooves of the pulleys and in the grooves are pins or projections which catch into the links of the chains as the buckets revolve, so that the chains may not slip in the grooves. The pulleys that are fixed on the axle of the suspension levers, are the fulcrum for the action of the buckets upon the mud &c. The line of drauft is regulated by raising or lowering the vertical sliding frame F, and the dip or depth at which the buckets scoop or excavate is regulated by lowering the suspension levers (c) (d).

The suspension braces are elevated or lowered as follows.

(K) is a chain which is attached to the center of the cross head of (d) the double arm or prong lever. This chain passes through (p) an eye, and from it along and around the capstan drum J, on the vertical shaft (i). The drum J has clutch teeth or notches on it which gear into a cross pin attached to a sliding rod in the center of (i), worked by a lever (l) as exhibited in Fig. 5. By lowering the pin on the shaft into the notches of the drum, the said capstan drum will move with the vertical shaft, the chain K, will be gathered around the drum and the suspension braces thus elevated—the contrary motion of the vertical shaft will lower the braces, or suspension levers (c) (d). The vertical sliding frame can be operated in the same manner as the suspension levers, or on the same principle, by having a loose drum on the horizontal shaft which drives the axle of (e^3). This horizontal shaft is driven by (i) the vertical shaft, being connected by bevel gearing with the same. The shaft (i) is connected to the crank shaft of the engine by bevel gearing. On the horizontal shaft of (e^3) which drives the double or two endless bucket chains, there are two bevel wheels for gearing and ungearing the horizontal shaft with the vertical shaft; Fig. 4, is a vertical view of this arrangement.

M, is the bevel wheel on the vertical shaft and O, O, are bevel wheels on the horizontal shaft, (l) is the lever or handle to work the clutch on the horizontal shaft. By gearing the outside bevel wheel with the vertical shaft by a clutch in the usual manner, the chains and buckets will be revolved, and by changing the clutch and gearing the inside bevel wheel, the motion of the buckets will be reversed.

The Fig. 3 is a view of the bottom of the bucket G. Q, is a steel spring attached to the catch rod K. The catch rod hooks into a catch T, on the side of the bucket, and the bucket is then closed in the bottom. By pressing on the bottom of the catch rod, the catch is released and the door (bottom) of the bucket then flies open. After the mud is discharged from the bucket, the door, (bottom) of the bucket is closed by its own weight, when the bucket is passing down between (e^3) and (e').

Fig. 6, is a transverse section view of the ports of the mud tender. v, is the mud receptacle or hold. (z) is a strong timber running the whole length of the scow or tender and fastened on the keelson: this timber z divides the discharge ports. The doors of the discharge ports are attached to windlasses (u) (u) by a chain or chains for the elevating and lowering said doors. s' s' are attached to the sides of the tender by strong joints and s^2 s^2 attached to the timber z by the same means. The ports of the tender are thus divided parallel with the timber (z). The doors are made of such depth as to be level with the bottom of the tender, when they are open, so that if the tender was to get aground in shoal water by letting down the doors, a portion of the mud would be discharged into the space below the dors and the scow (tender) thus released of some of its load, would gradually rise discharging its load. The scows or mud tenders that are at present in use have port doors that project, when open, below the bottom of the vessel, and none have been used that employ any more than one door on each side of the keelson.

The apparatus and machinery described in the foregoing for the purposes set forth is attached on the one side of the boat, and I chose to employ a like apparatus on the other side, so as to have two different sets of buckets in operation at the same time. The cranes are for operating the diving bell or the tong, they therefore need not be de-

scribed. The sharp upright stakes are for keeping the boat steady in a swift current, by driving them into the bed of the river.

Having thus described my invention, I do not claim the revolving buckets for excavating as they have been long used for that purpose, but

I claim—

The vertical sliding frame F, to regulate the scooping line of drauft, in combination with the suspension levers, whereby the buckets as they revolve over the pulleys, are made to scoop at any angle, at any depth.

JAMES CALLAGHAN.

Witnesses:

BENJ. T. CONYDEN,

R. MACFARLANE.