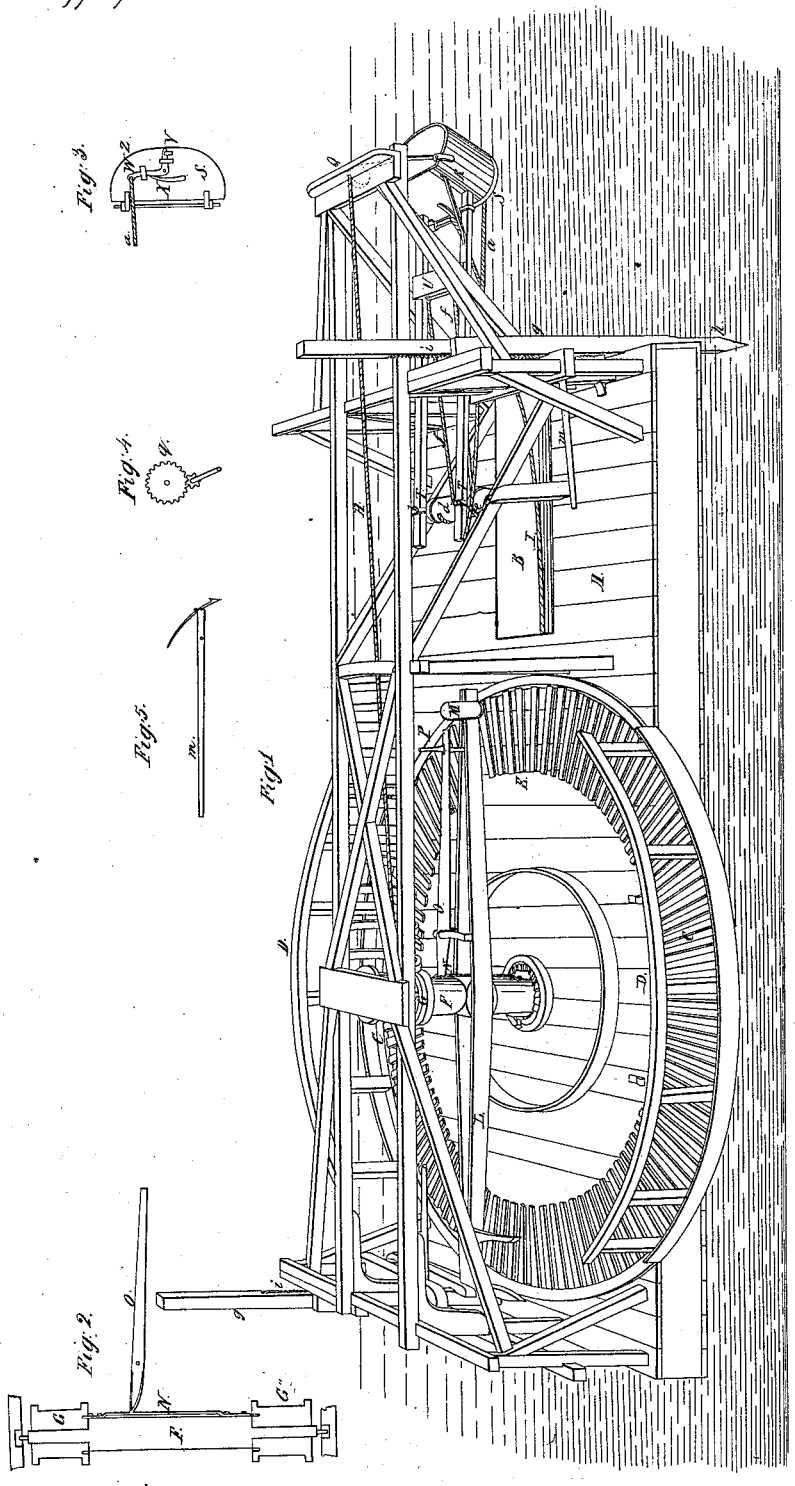
W. Easby.

Dredger.

No. 1,727. Patented Aug. 25, 1840.



UNITED STATES PATENT OFFICE.

WILLIAM EASBY, OF WASHINGTON, DISTRICT OF COLUMBIA.

DREDGING-MACHINE.

Specification of Letters Patent No. 1,727, dated August 25, 1840.

To all whom it may concern:

Be it known that I, WILLIAM EASBY, of the city of Washington, in the District of Columbia, have invented a new and useful improvement in machines for deepening harbors, rivers, canals, and other places by excavating and removing the mud from the bottoms thereof, called "Easby's improved dredging-machine," which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a perspective view of the machine. Fig. 2 is a vertical section of the main shaft and drums. Fig. 3 is a view of the under side of the drop or shutter of the scoop. Fig. 4, gearing of the windlass. Fig. 5, lever and lifting dog for raising the vertical anchors.

Similar letters refer to similar parts in the figures.

The vessel A, Fig. 1, for containing and supporting the several parts of the machine hereafter described is made of sufficient size, strength, and buoyancy to answer the intended purpose, resembling generally some other vessels in use except at the bow, where it is recessed, as at B, for the purpose of allowing the bucket or scoop and poles to pass into the space or recess at the bow in letting down and raising the scoop, &c., and excepting also at the sides where there are attached by hinges two segment wings C C, made movable so as to be raised up out of the way when required to carry the boat through locks and other narrow passes, which movable wings are furnished with guards or rails D which rest on deck when they are turned over and down upon it. These segment wings form part of a circular horse track E of greater diameter than the width of the boat formed on deck between midships and the stern, and are supported by movable sliding beams projecting through the sides of the vessel under said wings.

A perpendicular shaft F carrying two barrels G on which the chains H and I are wound, is placed in the center of the circular horse track E, its lower gudgeon turning in an oil cup or box fixed on the keelson and its upper gudgeon turning in a box fixed in a cap piece of the frame erected on deck for supporting the several parts of the machine requiring to be supported by it. This shaft F is turned by one or more horses attached to the end of a horizontal sweep L fixed permanently to the shaft. A seat M for the driver or attendant is formed on the opposite end of the sweep.

The barrels C on which are wound the chains H attached to the scoop are made of suitable material, of any convenient diameter, with rims at the ends to keep the chains from slipping off in winding, which barrels turn with the shaft when locked to it and loosely on it when unlocked, one barrel being always in gear while the other is out of gear, or both may be out of gear when required.

The locking and unlocking and gearing and ungearing are effected by means of a vertical bolt N arranged against the shaft between the barrels and held in place by staples inserted in the shaft in which it moves and attached to the short end of a horizontal lever O for raising and lowering it in order to throw it in and out of gear alternately with the upper and lower barrels into which it enters in mortises, in said barrels, the fulcrum of which lever is fixed on the upper side of the sweep near the shaft, while its long end extends within reach of the attendant seated on the sweep, who raises and lowers the lever as he wishes to throw the barrels in and out of gear, said lever being held in its place by means of a spring catch P attached to the sweep and passing through the lever in a mortise therein. The position of the lower barrel is below the deck, and the upper one above it. The main chain H for raising the scoop extends horizontally from the upper barrel over a pulley Q at the forward end of the frame, then down vertically to the bale or handle of the scoop, to which it is attached.

The scoop R for receiving the mud, &c., is made of stout wrought iron in a very strong manner of a semi-oval shape, open on the upper side and closed on the lower side by a shutter S or drop which can be opened and closed at pleasure by the attendant. The side toward the vessel is straight, the opposite side and the ends are curved. It is secured firmly by straps, bars, bolts and pins to the ends of two parallel poles or rods T T connected together by a cross brace U. The straight side or back of the scoop, which is fastened to the poles, forms an obtuse angle with it. The hinge of the shutter or drop may be constructed in the usual or most approved mode of such hinges. When closed it is secured by a catch V pro-

jecting down from the edge of the curved side of the scoop and passing through a mortise in the shutter near its edge to the under side of which drop is attached a right angled dog W which is forced by a spring X between the shutter and catch and thus holds it closed, which dog turns on a pin Z passed through its angle into the shutter, the spring X, which is also attached to the shutter, bearing against one side of said dog for keeping it in gear; to the extremity of one of its arms is attached a small cord or chain *a* leading along the side of one of the parallel poles to which it is made fast and which cord the attendant pulls when he desires to let the shutter drop, which draws back the dog, contracts the spring, disengages the dog from the catch, the gravity of the shutter causing it to drop. It is closed by striking against the water when the scoop is let down for a new load.

The parallel poles T to which the scoop is fixed may be round or square and of any convenient length and thickness. Shod with plates of metal to prevent wearing and extended through loops *b* fastened to circular loose collars *c* turning on a horizontal shaft or windlass *d* which turns on gudgeons in boxes fixed to two inclined braces of the frame over the opening in the bow of the vessel, by manual power by a crank shaft and cogged gearing *g* Fig. 4, for winding a chain *f* attached to the cross brace *u* of the parallel poles T for raising them with the scoop to any required position, the aforesaid loops *b* serving as guides for the poles which move upward and downward in them. Another chain I leading from the lower barrel G on the main shaft F is attached to the scoop R for drawing it back when it is raised by the windlass *d* and poles T from the bottom, and being drawn back sufficiently far, or to its required position, the barrel is disengaged which lets the scoop fall to the bottom. The main shaft and the windlass are both provided with circular racks and pawls of the usual construction.

Vertical anchors *g* are arranged at the corners of the vessel for descending into the mud or bottom for holding the vessel firmly to a secure anchorage. Each of said vertical anchors consists of a long heavy piece of square timber (*g*) pointed and shod on the lower end for entering the bottom of harbors, rivers &c. It moves in vertical grooves formed in any convenient manner in the frame. Or instead of shoeing it there may be a sharp pointed bar of iron *h* inserted in the lower end of the anchor timber and properly secured by bolts. A vertical rack *i* is fastened on the side of the anchor toward the vessel into which plays a lifting dog K Fig. 5 attached to the short end of a lever *m* for raising the anchor whose fulcrum is on a horizontal cross piece of the frame; which lever is operated by manual power in raising the anchor, its gain being held by a common dog placed below it which is put in gear with the rack before beginning to raise the anchor and remains constantly in gear during the operation—and when the anchor is to be let down it is ungeared and moved out of the way. All the anchors are provided in a similar manner to that just described.

The operation of this dredging machine is as follows: It being properly anchored at the place where the excavation is to be made in the manner before described by the anchors (*g*) and the wings brought down to their proper position the horse is driven around the circular track E constantly without stopping during the operation, the changes of the bearing being effected by the attendant while the horse is in motion. He draws the spring catch P toward him and raises the long end of the lever O which depresses the short end carrying down the bolt N and unlocking it from the upper barrel G and at the same time locking it with the lower barrel G, the upper barrel being thus liberated from the bolt turns loosely on the shaft F suffering the scoop R to descend suddenly to the bottom of the river or harbor. The other barrel G being in gear winds up the chain I attached to the bottom of the scoop and draws it back toward said barrel until it is brought over the place where the excavation is to be made when the scoop descends to its place of destination at the same time the bolt is drawn from the lower barrel and inserted in the upper one. The lower barrel is then loose and the upper barrel turns with the shaft, winds up the chain H, raises the scoop with its load of earth, &c., until the drop S is nearly in a horizontal position when the attendant draws the cord *a* attached to the right angled dog W, Fig. 3, which liberates it from the catch when the drop falls and the load is discharged upon or into a receiver placed below it.

What I claim as my invention and which I desire to secure by Letters Patent consists in—

1. The arrangement of the barrels on the perpendicular shaft for winding and unwinding the main chains in combination with the vertical sliding bolt and lever for throwing the barrels in and out of gear with the shaft by which the scoop or bucket is alternately raised, lowered, and drawn back while the animal by which the main shaft is turned continues to travel around on the circular track without interruption as before described.

2. Also the combination and arrangement of the parallel guide poles, chains, and windlass for raising the scoop so as to draw it back to its proper position as before de-

scribed, and this I also claim in combination with the scoop and the apparatus for disengaging the drop or shutter to discharge the load, as described.

3. I also claim the arrangement of the wings of the horse track which can be raised and thereby reduce the width of the machine so that it may pass through a canal lock or any other narrow place as before described.

WM. EASBY.

Witnesses:
W. E. HOWARD,
WM. P. ELLIOT.