



W. D. ROBERTSON.  
DREDGING MACHINE.

No. 103,373.

Patented May 24, 1870.

Fig 1.

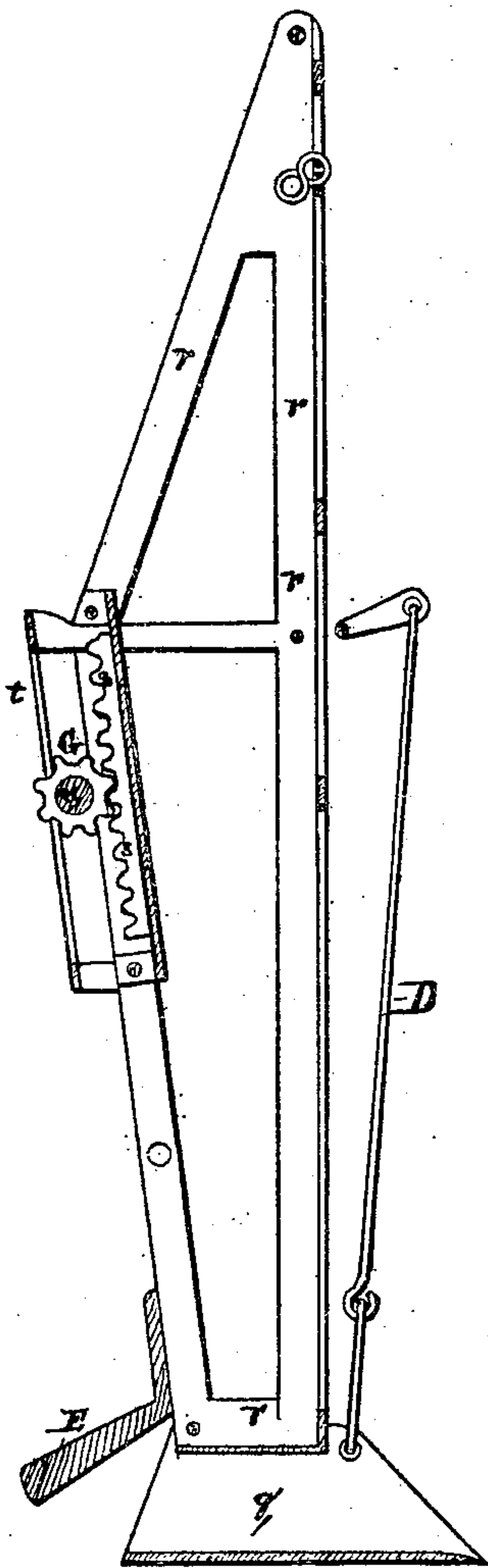
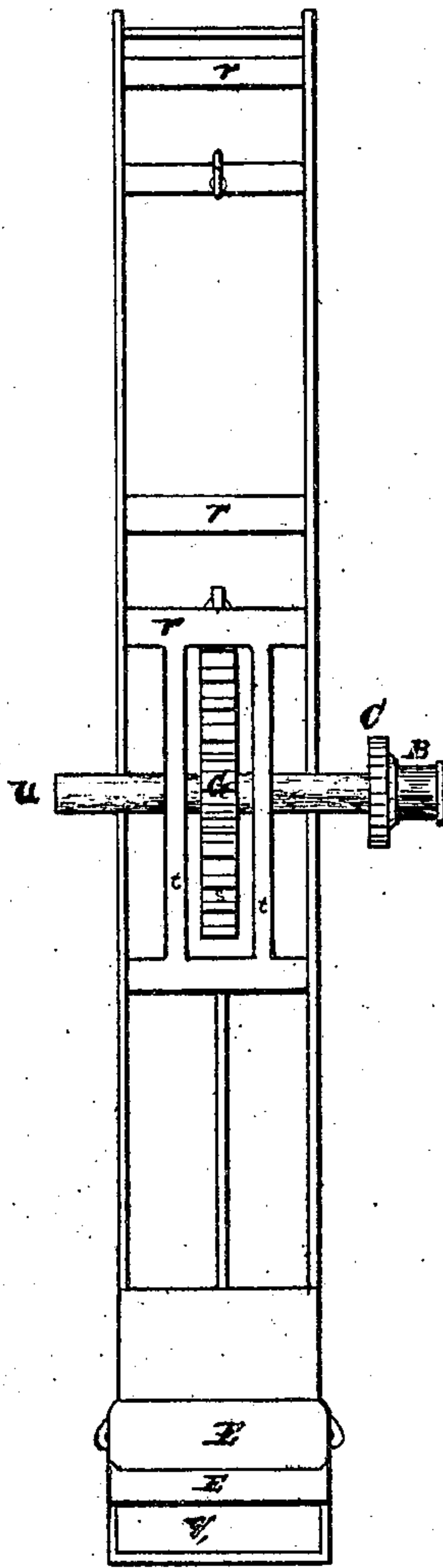


Fig 2



Sheet 2

**Witnesses:**

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# United States Patent Office.

WILLIAM D. ROBERTSON, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 103,373, dated May 24, 1870.

## IMPROVEMENT IN DREDGING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM D. ROBERTSON, of the city and county of San Francisco, State of California, have invented a new and improved Floating Ditching-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters marked thereon.

My invention refers to certain improvements in that class of excavating machines used for forming ditches or canals, the machinery of which is placed upon a scow or suitable vessel, and floats upon the water when in operation, and in which a single scoop is used for removing the earth.

The invention consists of certain details of construction hereinafter more fully described.

In the drawings—

Figure 1, sheet 1, is an elevation of a machine having my improvements.

Figure 2, sheet 1, is a plan of the same, with scoop and scoop-frame removed.

Figure 1, sheet 2, is a longitudinal section of scoop and scoop-frame.

Figure 2, sheet 2, is a rear elevation of same.

Figure 1, sheet 3, represents a sectional elevation of the circular track, traveling-frame, and a portion of the scoop-frame; and

Figure 2, sheet 3, represents a plan view of the shaft and gear-wheel, upon which the scoop-frame travels.

To enable others skilled in the art or science to which it most nearly appertains to make and use my invention, I will proceed to describe fully its construction and operation.

*a* is the scow, upon which the machinery floats, across which are placed transverse timbers *b*, projecting beyond the sides of the scow, to which the frame *c* is secured.

*d* is the driving-shaft, that receives motion by means of the pulley *e*, from a steam-engine, or other motive power, suitably placed abaft the shaft.

The pointed stake-plates *f* are caused to penetrate the earth on each side of the ditch by being allowed to drop with the frame *g* from the position shown in fig. 1, sheet 1.

The frame *g* is hinged to the racks *g*.

The racks *g* are actuated by means of pawls *h*, which are eccentrically attached to the main shaft, and receive their motion therefrom. The motion thus communicated to the racks causes the scow to advance forward, through the medium of the frame and stake-plates, by means of which a hold is secured upon the bottom of the ditch.

For the purpose of preventing the racks from being thrown backward by the return movement of the

pawls *h*, stops *j* are provided, as shown. A suitable lever is also provided, to disconnect the pawl and stop entirely from the racks when it is desired that the boat shall remain stationary.

For drawing the stake-plates *f* out of the ground, and elevating them to the position shown in sheet 1, fig. 1, and causing the rack *g* to advance until it comes in contact with the stops *k*, the frame *l*, the chain-shives *m*, the drums *n*, and the chains *o* are provided.

The drums *p* roll along on each side of the ditch to prevent careening, and should be made larger to prevent sinking into the ground, and adjustable to correspond to the height of water in the ditch. These drums should also be constructed in such a manner that their bouyancy will tend to steady the machine in case the surface of the ground acted upon was entirely submerged.

The scoop *q* differs essentially from all others in being open at the back. It is hinged to the scoop-frame *r*. This frame is provided with the rack *s* and guides *t*, between which the shaft *u* passes, the bearings of which are secured to the projecting parallel faces of the revolving or oscillating frame.

The frame *v* is provided with wheels or rollers that run on the circular track *w*, and is caused to revolve to the right or left about the hollow shaft *w*, by means of the chains *x* and drums *y*.

To the upper end of the scoop-frame *r* is attached a chain, *z*, that passes down through the hollow shaft *w*, guided by suitable chain-shives, to the drum *A*.

To the shaft *u* is keyed fast a friction brake-pulley, *B*, and ratchet-wheel *C*, and pinion *G*.

The hereinbefore-described apparatus is provided with suitable clutch devices, brakes and levers, in order that it may be properly operated, in the usual well-known manner.

The operation of the scoop is as follows:

By causing the drum *A* to revolve, the upper end of the scoop-frame is drawn down toward the hollow shaft *w*, causing the scoop to move forward and upward, passing around the shaft *u* as a center, filling with earth as it moves, and closing against the back plate *E*.

When the top of the scoop-frame has thus been drawn down so far as to cause the guide *t* to pass the horizontal position, it is plain that the weight of the scoop and frame will cause them to slide inboard on the shaft *u*, rolling on the pinion *G*.

When this takes place, the drum *A* is disengaged from the shaft *d*, but prevented from revolving by means of the friction-brake *F*, and the necessary horizontal movement is then given to the scoop by means of the revolving or oscillating frame *v*, which is operated by the chain and pulleys, as before described.



When the scoop has arrived over the desired point, the earth is discharged by means of the rod D, causing the scoop to turn on its hinges, and open a passage for the earth between the scoop and the back plate E.

By reversing the motion of the frame *v* the scoop and scoop-frame are brought back into a vertical plane, passing through the next earth or debris to be raised.

The brake is applied to the pulley B to prevent the shaft *u* from turning, and the brake F is thrown off, permitting the drum A to revolve and slacken the chain *z*, and allow the scoop-frame to resume a vertical position.

In this position, the rod D being slack, and the forward end of the scoop being the heaviest, that end will be inclined downward ready to penetrate the earth, when we free the pulley B, and allow the scoop and scoop-frame to drop.

By having the back end of the scoop open the water is allowed to pass through, and thus offer less resistance to the downward passage of the scoop, or the operation of filling it with earth.

A cutter, H, is hinged to the scoop-frame, which,

by being allowed to drop, cuts the earth in advance of the scoop, shown at fig. 1, sheet 1.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The scoop *q*, and back plate E, constructed and operated substantially as described.

2. The scoop *q*, back plate E, frame *r*, rack *s*, pinion G, shaft *n*, ratchet-wheel C, friction brake-wheel B, and guides *t*, combined and arranged to operate substantially as described.

3. The combination of the overhanging frame *c* and the drums *p*, with the scow *a*, substantially as described.

4. The combination of the stake-plates *f*, the frames *g* and *e*, the racks *g'*, the pawls *h* and *i*, the chains *x*, drums *n*, and suitable breaks and levers, with a scow, as and for the purpose described.

In testimony whereof I have hereunto set my hand and seal.

Witnesses: W. D. ROBERTSON. [L. S.]

C. W. M. SMITH

E. V. SUTTER.