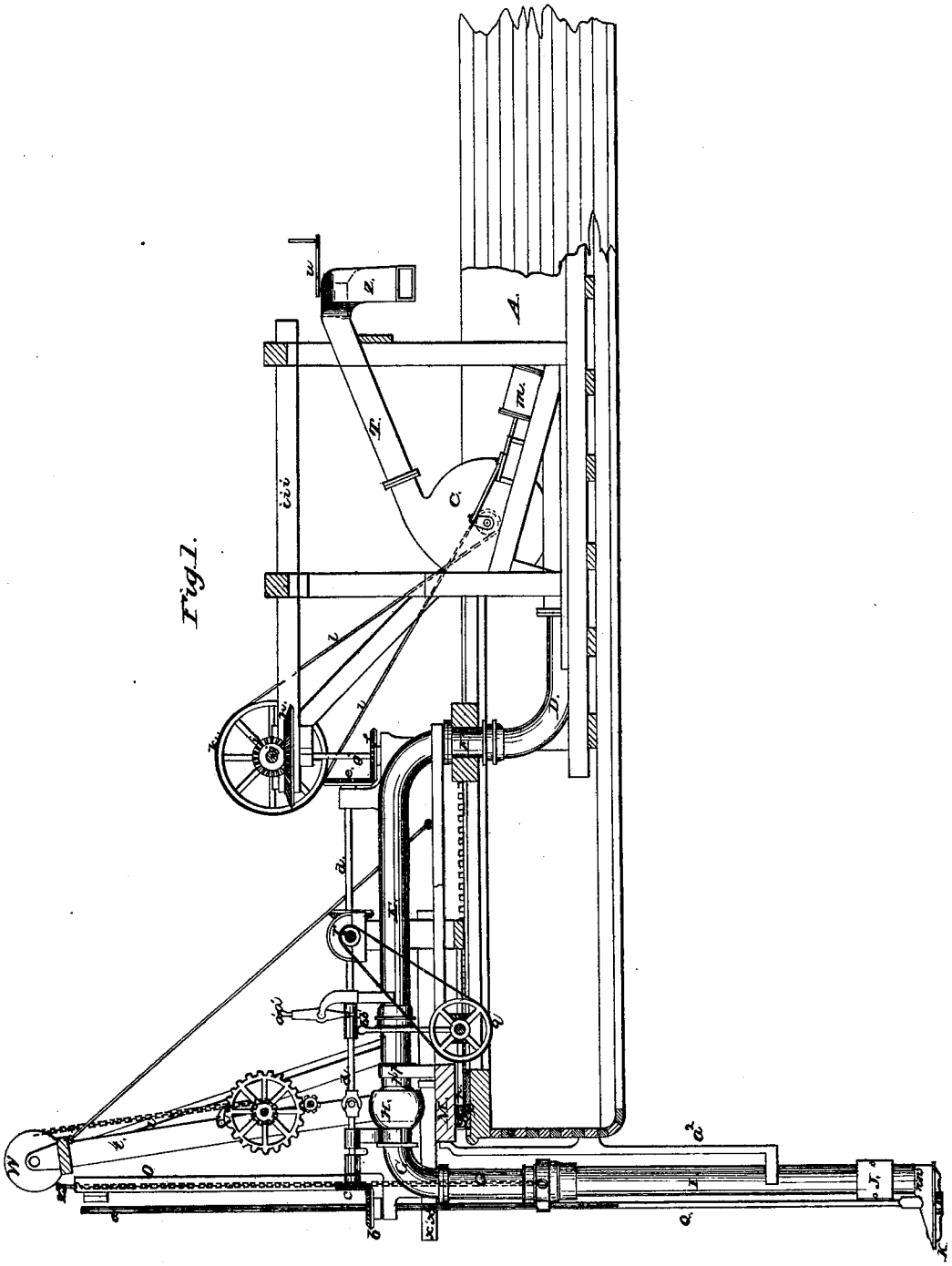
3 Sheets—Sheet 1.

A. W. VON SCHMIDT.

DREDGING-MACHINE.

No. 185,600. Patented Dec. 19, 1876.

Fig. 1.



Witnesses:

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James L. King

Inventor.

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3 Sheets—Sheet 2.

A. W. VON SCHMIDT.

DREDGING-MACHINE.

No. 185,600. Patented Dec. 19, 1876.

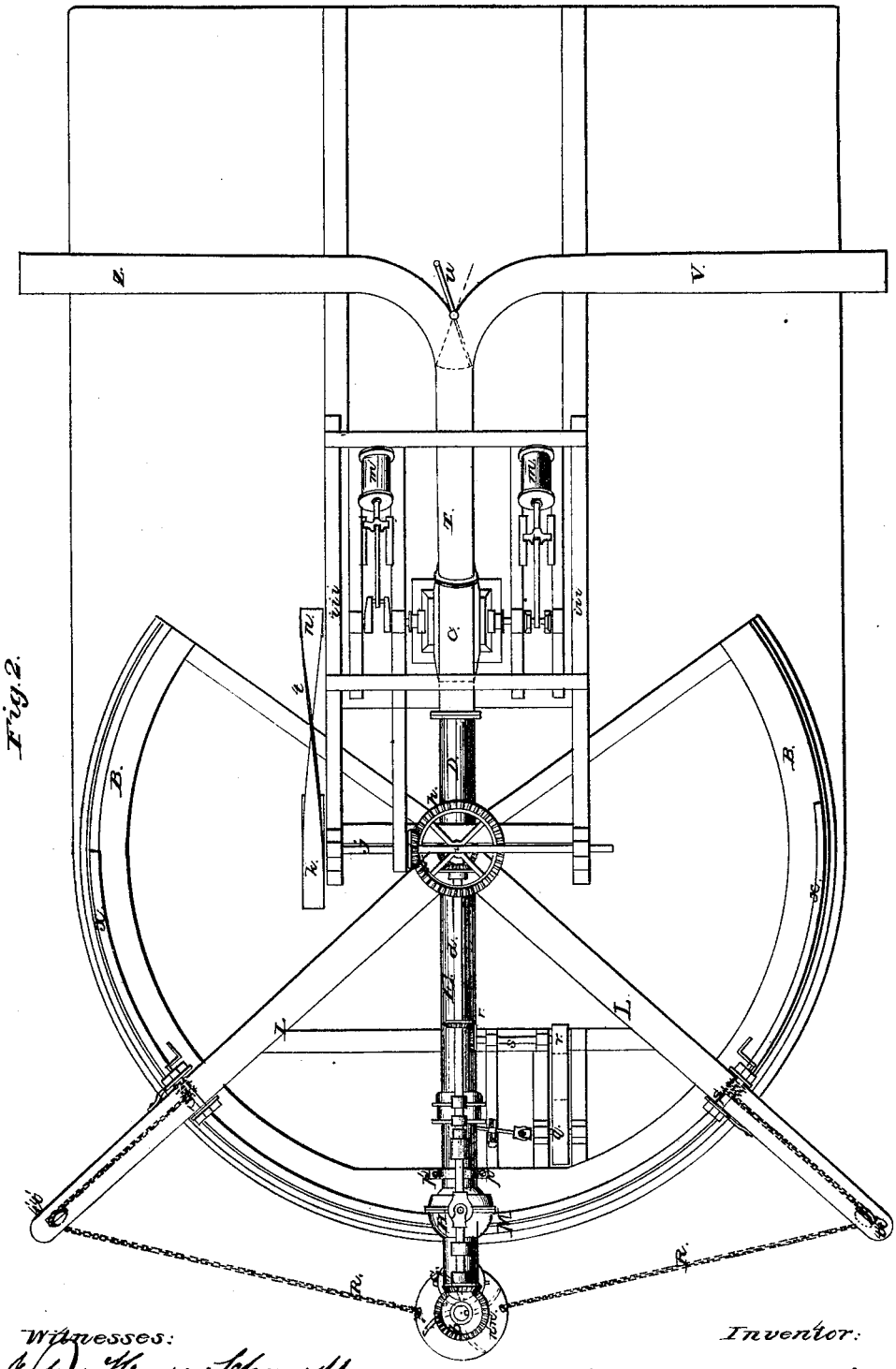

Fig. 2.

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DREDGING-MACHINE.

No. 185,600. Patented Dec. 19, 1876.

Fig. 3.

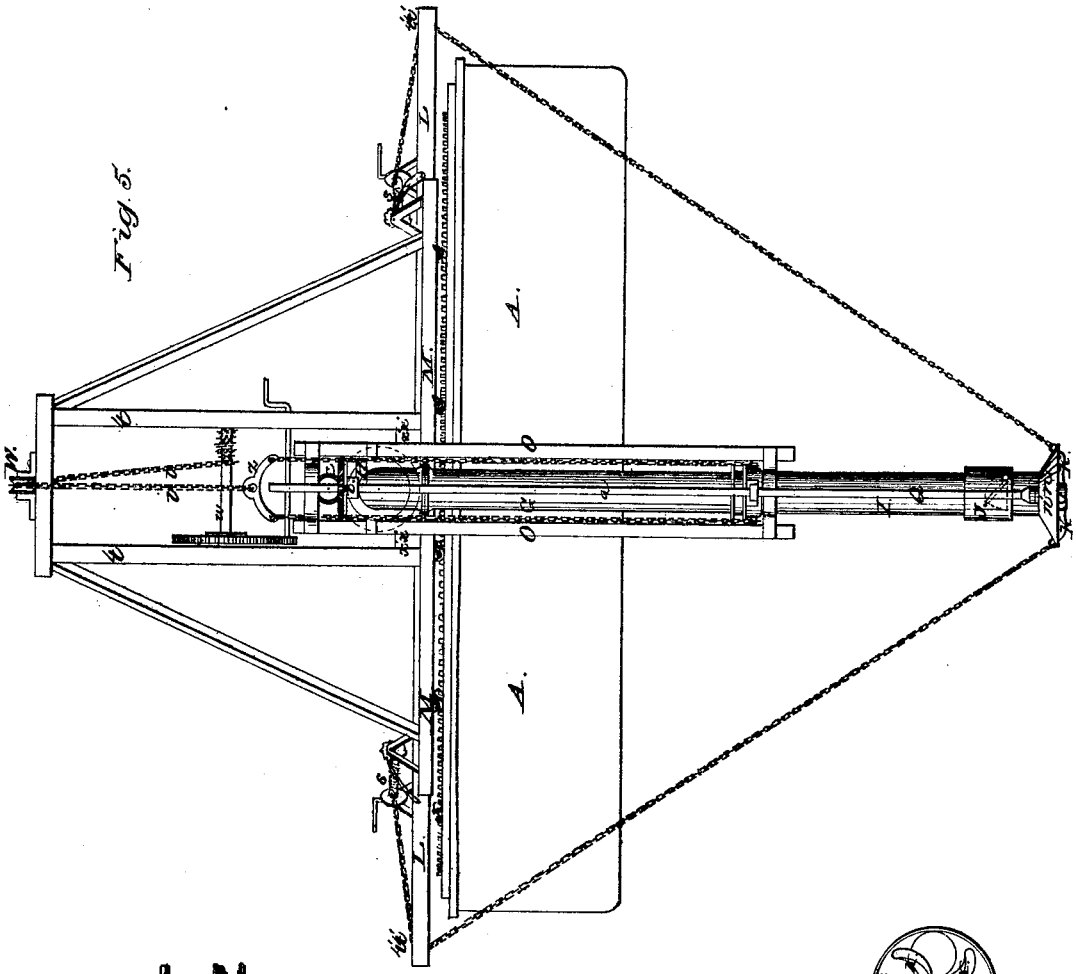


Fig. 5.

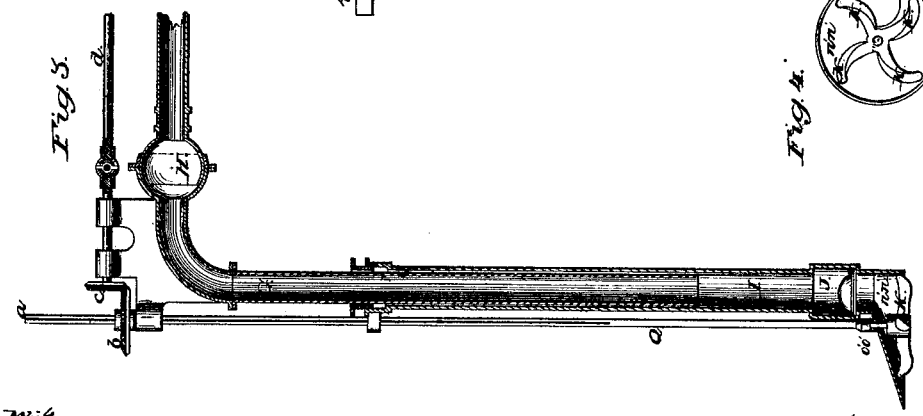
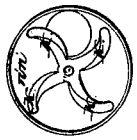


Fig. 4.



Witnesses

Julius A. von Schmidt

James L. Kemp

Inventor:

Alexey W. Von Schmidt

UNITED STATES PATENT OFFICE.

ALLEXEY W. VON SCHMIDT, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN DREDGING-MACHINES.

Specification forming part of Letters Patent No. **185,600**, dated December 19, 1876; application filed July 3, 1876.

To all whom it may concern:

Be it known that I, ALLEXEY W. VON SCHMIDT, of the city and county of San Francisco and State of California, have invented a new and Improved Machine for Dredging Sand and Mud from bars, rivers, harbors, and docks; and I do hereby declare that the following is a full, true, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

My invention has for its object the excavating of sand and mud and other substances by means of a suction produced by a rotary pump through a telescopic pipe and rotating cutter operating at the bottom of the pipe, the peculiar construction and arrangements of the several parts to be hereafter explained; the whole operating on a boat or scow, and driven by steam-power.

To enable those skilled to make and use my improved dredging-machine, I will proceed to describe the construction and operation of the same, referring by letters to the accompanying drawings, in which—

Figure 1 is a side elevation, representing the various parts of the machine and scow-boat. Fig. 2 represents a top view of the same; Fig. 3, a side view of telescopic pipe and rod, with excavator at end of pipe. Fig. 5 represents end view of scow, frame, and telescopic pipe, with excavator and chains in position.

A represents a scow-boat of any required size, one end of which is made circular, and the other end either square or sharp. The circular end of the scow is the one over which I work the telescopic pipe, and over which it travels back and forth, as represented at B. On the deck of the scow-boat I place an iron segment-rack with cogs, secured to the deck of the scow with bolts, as shown at *x*. C represents the centrifugal pump, for forming the vacuum and suction. D represents the stationary suction-pipe, leading from the movable suction-pipe E, which connects in the universal joint or sleeve at F, Fig. 1. G represents the telescopic pipe, which connects with the movable suction-pipe E at H by means of a ball-and-socket joint. I represents the lower suction or telescopic pipe, with the check-valve J and excavator K. Q represents the rod that gives motion to the excavator K by means of beveled cog-gear *c* and shaft *d*, Figs. 1, 2, 3, and the beveled cog-gear wheels *e* and *f* by shaft *g* and beveled cog-gear wheels *h* and *i* on shaft *j*, all of which are driven by belt *l* and run by engines *m n*, Fig. 2.

L represents two wooden arms projecting out from the boat, having sheaves at the outer ends for chains to pass through, for the purpose of hauling the end of the telescopic pipe and governing its motion. These arms are secured to the circular platform M, which platform rests upon small rollers *o*, which rollers support the movable circular platform M. The iron rollers move upon the side of the iron rack and bed-plate *x*, Fig. 2. The movable frame or circular platform works upon a center, as represented at F. This forms the center for the frame, so that when the machine is at work the cut made at the bottom is of a semicircular form.

The frame is moved from side to side by a small pinion cog-wheel, *p*, which pinion works in the iron circular rack *x*. This pinion is set in motion by means of a pulley, *q*, receiving its power from pulley *r*, on shaft *s*, and shaft *d*.

The frame-work *t* is constructed for the purpose of supporting the wheel or sheave W and winch *u*. The winch *u* is used for raising or lowering the telescopic pipe I when and as required, and the chain *v*, working over sheave W, connects with an iron yoke at Z. From this yoke two chains pass down to the telescopic pipe I and take hold of two lugs, as represented at N, one on each side of the upper end of pipe I. *x' x'* represent two scantlings, secured to the platform M. These scantlings steady the vertical frame-work O. This frame O represents the frame working between the two scantlings *x' x'*, and are for the purpose of steadying the suction-pipes G and I from swinging from side to side or twisting when at work. Q represents a slotted iron rod, for the purpose of working the excavator K.

R represents chains, connecting with winches *s*, and passing over the sheaves at the outer arms *t' t'*, thence running down to the lower end of the telescopic pipe I, and there

fastened to the enlarged portion of pipe n' n'. These chains are for the purpose of hauling the pipe when at work by means of the arms L in the direction that the work is to be done, the lower end of the pipe being steadied or supported by a suitable bracket or clutch at the lower end of a vibrating arm, a^2, pivoted to the frame M.

T represents the discharge-pipe from the pump C. U represents a valve, working inside of the discharge-pipe, for the purpose of turning the discharged material to either side of the boat. This pipe has two branches, as represented in Fig. 2 at V or Z. a^1 a^1 represent a lever, for the purpose of disconnecting shaft d with the beveled cog-wheel c. b' b' represent a lever for the purpose of reversing the motion of the frame M and arms L L. n' n' represent the enlarged mouth or end of suction-pipe, (lower end,) in which the cutter or excavator K works.

This enlargement can be made of any size required, and is cast separate from the telescopic pipe I, as shown in the enlarged view, Figs. 3 and 4.

a represents a slot in the iron rod Q. This rod is run through the center of the beveled cog-wheel b. This beveled cog-wheel b has a key or feather fitted so that the rod Q can pass freely through the wheel b, and at the same time it obtains its power to work the excavator K, and enables the lowering or raising of the telescopic pipe I at pleasure, without interfering with the rod or the excavator.

o' o' represent a journal or box, through which the iron rod Q passes into the enlarged portion of the suction-pipe. K represents the shape of the excavator, which shape can be changed in accordance to the kind of material to be operated upon. The cutter or excavator is worked so as to draw the material toward its center, when it is loosened and drawn up the pipe by the pump C. p' p' represent a stand of iron secured to the frame M, to support the suction-pipe E inside of the ball-and-socket joint H. i i i represent a frame-work to support the shafts and pulley and wheels K i j h.

The operation of the machine is as follows: When the machine is placed in position and ready for work, the boat or scow, having been secured in the usual way either by chains, lines, or spuds, the telescopic pipe I is then lowered to the necessary depth, the slack of the chains taken in and hauled taut by means of the winches. I then charge the pump with water, which is retained in the suction-pipe by the check-valve. The air having been excluded by the water, I then start my engine and pump at the necessary speed, which causes a vacuum to form in the suction-pipe. The excavator is set in motion and the feed put on the frame L L, when the chains pull on the end of the suction-pipe in the direction the cut is to be made.

The action of the cutters or excavator is to loosen the material to be dredged, the silt passing up the pipe through the pump and forced out at the discharge-pipe to either side of the boat into scows, or over an embankment, as required. The cut is made on a curve from side to side, the feed being reversed at pleasure.

When the cut has been made (say, to the right) as far as desired, the telescopic pipe can either be lowered to deepen the cut, or the boat can be moved forward or back so as to continue the work at the same depth. The result is that a constant stream is being thrown by the pump.

If the pipe should become choked, the pipe can be raised from the bottom, when the clear water will at once clean the pipe.

When the machine is to be moved any considerable distance, the telescopic pipe is raised, and can be laid on the side of the scow.

I am aware that rotary pumps have been used for pumping mud and sand, and I do not desire to be understood as claiming the use of the pump as new; but

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

1. The combination, with the telescopic conveying-pipe I, having an enlargement or hood, n' n', and rotary pump C, the excavator K, and suitable means for rotating the same, substantially as and for the purposes described.

2. In combination with the telescopic tube and excavator, the grooved driving-shaft Q, vertically-movable frame O, and loose feathered pinion b, supported upon a bracket mounted upon the pipe G, and meshing with the driving-pinions c, whereby motion may be imparted to the excavator without reference to the distended or collapsed condition of the conveying telescopic tube, substantially as hereinbefore described.

3. In combination with the platform M, centered at F, arms L, and vibrating telescopic tube G I, the chains R R, whereby the tube and excavator may be inclined and held at varying angles to a perpendicular line, or caused to sweep, substantially as and for the purpose set forth.

4. In combination with the platform M, centered at F, arms L, vibrating telescopic tube G I, and pendent vibrating support a^2, the chains R R, whereby the tube and excavator may be inclined and held at varying angles to a perpendicular line, or caused to sweep, substantially as and for the purpose set forth.

ALLEXEY W. VON SCHMIDT.

Witnesses:
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