E. SMITH.

Hydraulic Dredging Apparatus.

No. 205,584. Patented July 2, 1878.

Fig. 1

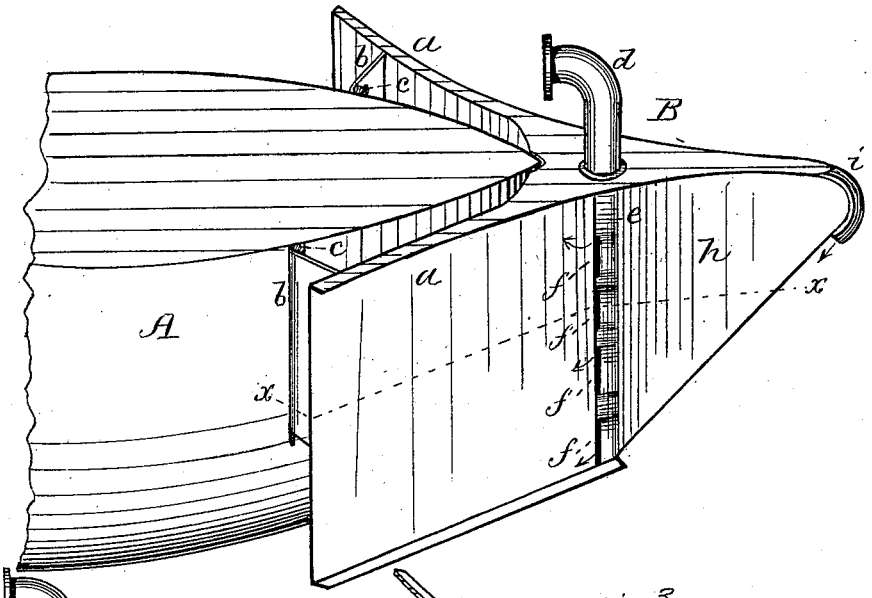


Fig. 2.

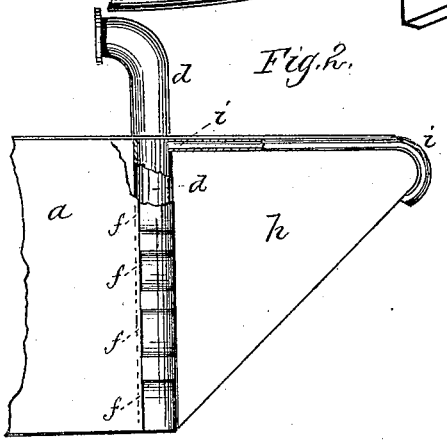
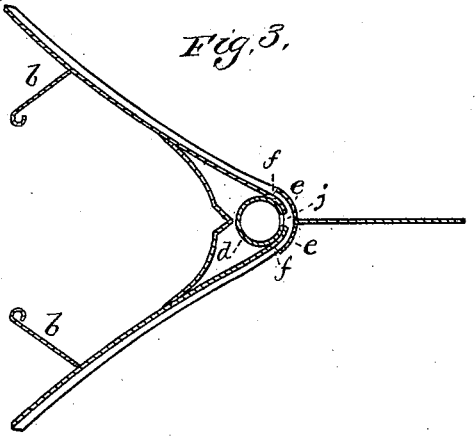


Fig. 3.



WITNESSES.

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ERASMUS SMITH, OF NORWICH, NEW YORK.

IMPROVEMENT IN HYDRAULIC DREDGING APPARATUS.

Specification forming part of Letters Patent No. **205,584**, dated July 2, 1878; application filed June 7, 1878.

To all whom it may concern:

Be it known that I, ERASMUS SMITH, of Norwich, in the county of Chenango and State of New York, have invented a new and valuable Improvement in Hydraulic Dredging Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 is a perspective view of my invention, showing the manner of connecting it to the front end of the boat. Fig. 2 is a side elevation, partly in broken section, and Fig. 3 a longitudinal central section taken on line *x x* of Fig. 1.

This invention has relation to hydraulic dredging-machines which are connected to the front end of a boat provided with the proper engines, pumps, and other contrivances commonly used for operating the same in deepening and straightening the channels of rivers, and also of harbors for ships, &c.

The invention therefore has for its object to facilitate the operation of dredging; also, to simplify the general construction of the machine, and render it more effective in its purpose, as will be hereinafter described.

In the accompanying drawings, A illustrates a portion of a boat to which the dredging-machine B is secured. The machine B is provided with guide plates or wings *a*, from the inner sides of which are webs *b*, for connecting the machine to the boat A. The webs *b*, upon their outer ends, are formed with eyes, or are bent around so as to embrace vertical rods *c*, secured to the sides of the boat. By this construction the dredging-machine B may be vertically adjustable, or, in other words, raised or lowered to set it at the proper depth previous to dredging.

The adjustability of the machine may be controlled by various means, either by rack and pinion suitably connected thereto and operated by a capstan, or in any other manner found most convenient.

From the upper part of the machine projects a pipe, *d*, curved at its upper end, and provided with a suitable flange for attaching a pipe or tube connecting with the engine or other water-forcing apparatus. The other or lower end of the pipe *d* communicates with a water-course, open at its sides, and covered with a plate, *e*, having corrugated or raised portions, to form outlets *f* for the water.

If desired, the pipe *d* may extend the entire length of the machine, and have a vertical opening, *j*, extending from the top of the wings *a* down to the bottom thereof, to form an outlet for the water previous to its being forced through the outlets *f*.

The wings *a* diverge at an angle of about forty-five degrees, and when the water is forced through the outlets *f* the plates or wings serve to keep the water in contact with the earth to be removed. Thus when the water is thrown into the pipe *d* and issues from the outlets *f*, and the wings kept close to the earth, they will hold the streams of water in contact therewith, and thereby economize the entire power applied to the water, and without wasting its force, as would be case were not some means used for deflecting or holding the water against the earth.

The central part or plow *h* of the machine has a pipe, *i*, connected thereto, one end of which communicates with the water course or supply and the other end curved in a downward direction, and again in a direction toward the opposite end of the pipe, which carries the water forward and in a direction with the curve of the pipe, to cut a channel in the earth for the plow or central part *h* of the machine that is not reached by the water issuing from the outlets *f*, and thereby enable the machine to move forward without obstruction.

It will be seen that a dredging-machine constructed according to my invention will accomplish its work quickly and effectually, the water retaining its velocity to a great extent.

It is evident that the guide-plates by which the water is prevented from spreading may be variously modified, and its position changed as circumstances may require, as long as the plates serve the same purpose of preserving the full force of the water and insure its full power upon the earth to be removed.

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

1. In combination with a dredging-boat, the hydraulic pipe or water-course, provided with outlets, and the directing or guide plates, arranged vertically upon said boat, substantially as and for the purpose set forth.

2. A dredging-machine consisting of a hydraulic pipe or water-course, provided with lateral outlet and directing-plates, vertically arranged, and adjustable upon the boat, substantially as and for the purpose described.

3. A dredging-machine consisting of the wings *a*, water-outlets *f*, in combination with the plow or central portion *h* and curved pipe *i*, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ERASMUS SMITH.

Witnesses:

ISAAC W. BAKER,

EDWARD D. BAKER.