

E. B. BISHOP.
Dredgers.

No. 137,998.

Patented April 22, 1873.

Fig. 1.

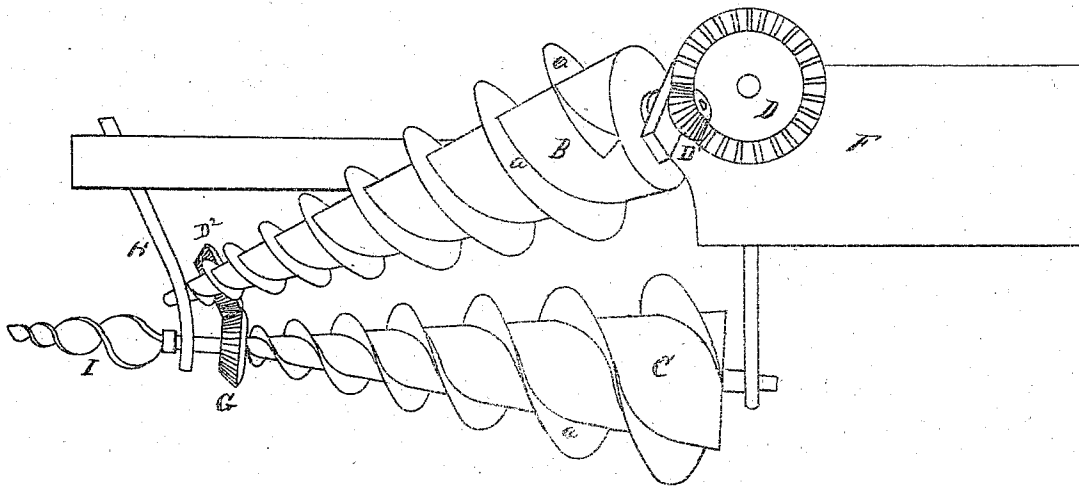
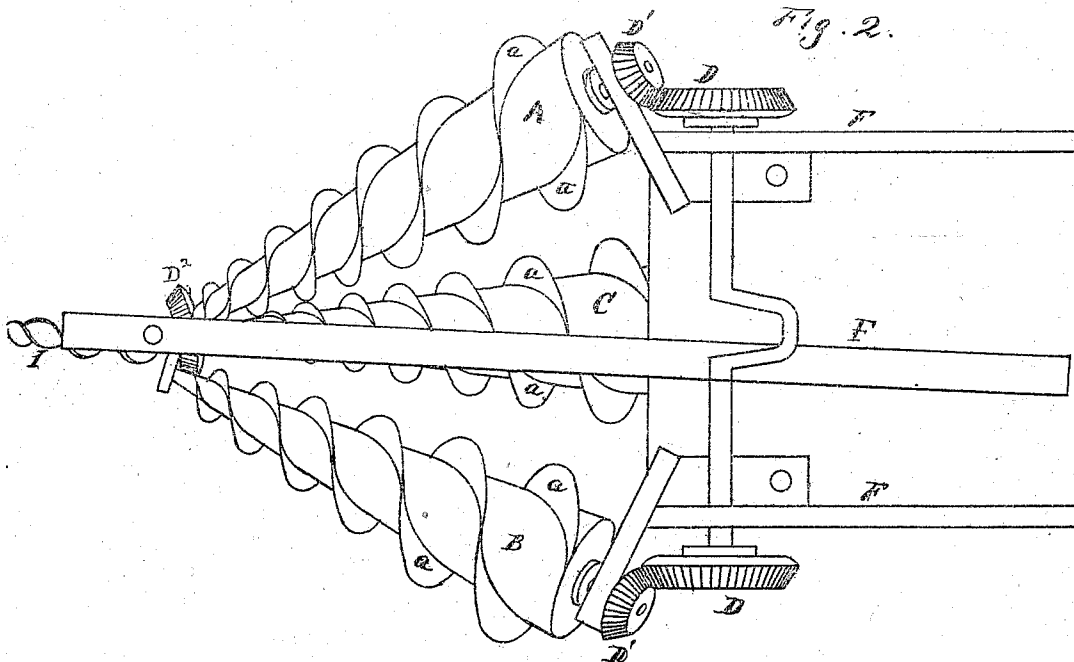


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

EPHRAIM B. BISHOP, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN DREDGERS.

Specification forming part of Letters Patent No. **137,998**, dated April 22, 1873; application filed August 15, 1872.

To all whom it may concern:

Be it known that I, EPHRAIM B. BISHOP, of San Francisco, in the county of San Francisco and State of California, have invented an Improvement in Dredging-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The object of my invention is to provide an improved dredging-machine for rivers, harbors, roadsteads, and sand-bars; and it consists mainly of three cone-shaped screws placed angularly with each other, and attached to the bow or stern of a boat. The conical shafts have spiral flanges around them at the proper pitch so that the center screw will engage the mud, sand, or *débris*, and the two outer screws will convey it away at the sides of the machine, and form a passage for ships of greater draft than would otherwise be the case where my invention is not employed. The screws are so arranged that they may be raised and lowered.

In the drawing, Figure 1 represents a side elevation. Fig. 2 is a plan or top view, the whole representing three pitched screws centering to a point in front of or at the bow of a ship to which my invention is to be attached for operation.

A and B are the two outside screws, and beneath which is the screw C, which is placed below the plane of the screws A B so that when the driving-power from the engine is applied either directly or by match or beveled gears D D¹ D² or shafts, or indirectly to the large outside screws, the center screw or screws will rotate. Each screw is provided with two or more spiral flanges, *a a a*, which may be made of boiler-iron with steel edges, or wholly of steel or cast plates screwed together. When more than one center screw is employed, or when two are applied, they should be caused to revolve to the right and left toward the outside screws, the spiral flanges being applied right and left, as shown. The center screw or screws C should be constructed smaller than the outside screws, which are intended principally to carry out and up the *débris*, puddling the sediment into the water, when the current of the screws, the tides, or current from the river carries the disturbed and suspended ma-

terial to harmless localities. The frame-work F F is attached to the bow of the boat, and is jointed so that the screws may be raised or lowered, which may be accomplished by steam-power or otherwise. Beveled gears D D¹ drive the two outer screws, but the screw C is only provided with a gear, G, which engages the beveled gear-wheel D² at the point of the screw-shaft A, while there is no gear on the small or lower end of screw B, but all three center to a point where they are sustained by the plate H, and in which the point of the shaft of screw B has its bearings.

It will be seen that the heel of the center screw is much lower than the point so as to form a deep center cut in its operation suitable for and to admit the passage of the keelson of the operating boat, which cut is made deeper as the boat advances on the bar by reason of the increasing circumference of the flanges of the center screw C, which commences to cut at the point, and gradually excavates or cuts a wider and deeper channel.

Two additional screws may be placed at the heel of the center screws, and incline to a point along the keelson, but in an opposite direction to the center screws so as to take up and carry out any of the disturbed material which has escaped the action of the said center screws. By this means the channel might be made still wider without much additional power or expense, as the additional screws may be matched into beveled gears which drive the forward screws, above described.

If advantage be taken of the ebb and flow of the tide, and the lesser point of a bar be taken against which operations are being carried on, it will be observed that the current produced by the ebb and flow of the tide, and the displacement of the water by the operating boat in its attempt to pass off will have a tendency to displace and carry away the loose sand and suspended portions of the *débris*; and this is one important feature of my invention; and to more fully carry out the object, a boat might be made to follow rapidly the path of the dredging-boat and apparatus, and the action of the water is thus made to deepen the channel and carry off the *débris*.

The point I at the end of the center screw is intended to plow up and prepare the way

for a more easy operation of the screws C, which enlarges the cut as progress is made.

When cuts are to be made in narrow places and in shallow water, as in small bayous or salt marsh, and in making canals, levees, and ditches it is intended to raise the mud and *débris* and throw it to the right or left or both by means of endless elevators, which may pass over the deck and under the bow or keel of the dredging-boat, in which case the flanges may be made scooping and with sharp cutting-edges.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The screw C placed below the plane and inclination of the screws A B, in combination with the screws A B, substantially as and for the purpose set forth and described.

2. The auxiliary screw point or bit I, substantially as described, for the purpose set forth.

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

E. B. BISHOP. [L. S.]

Witnesses:

C. W. M. SMITH,
PHILIP MAHLER.