

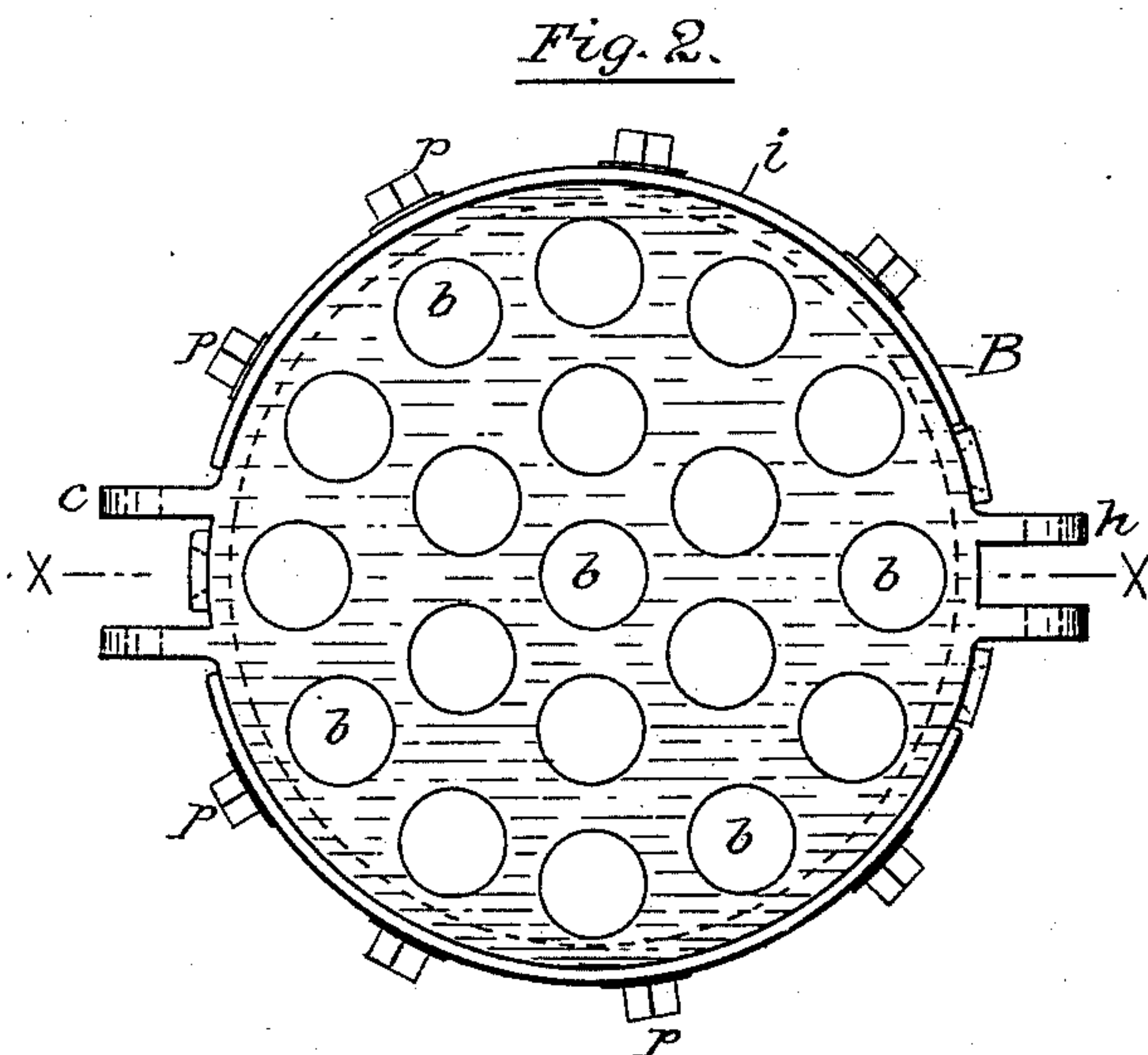
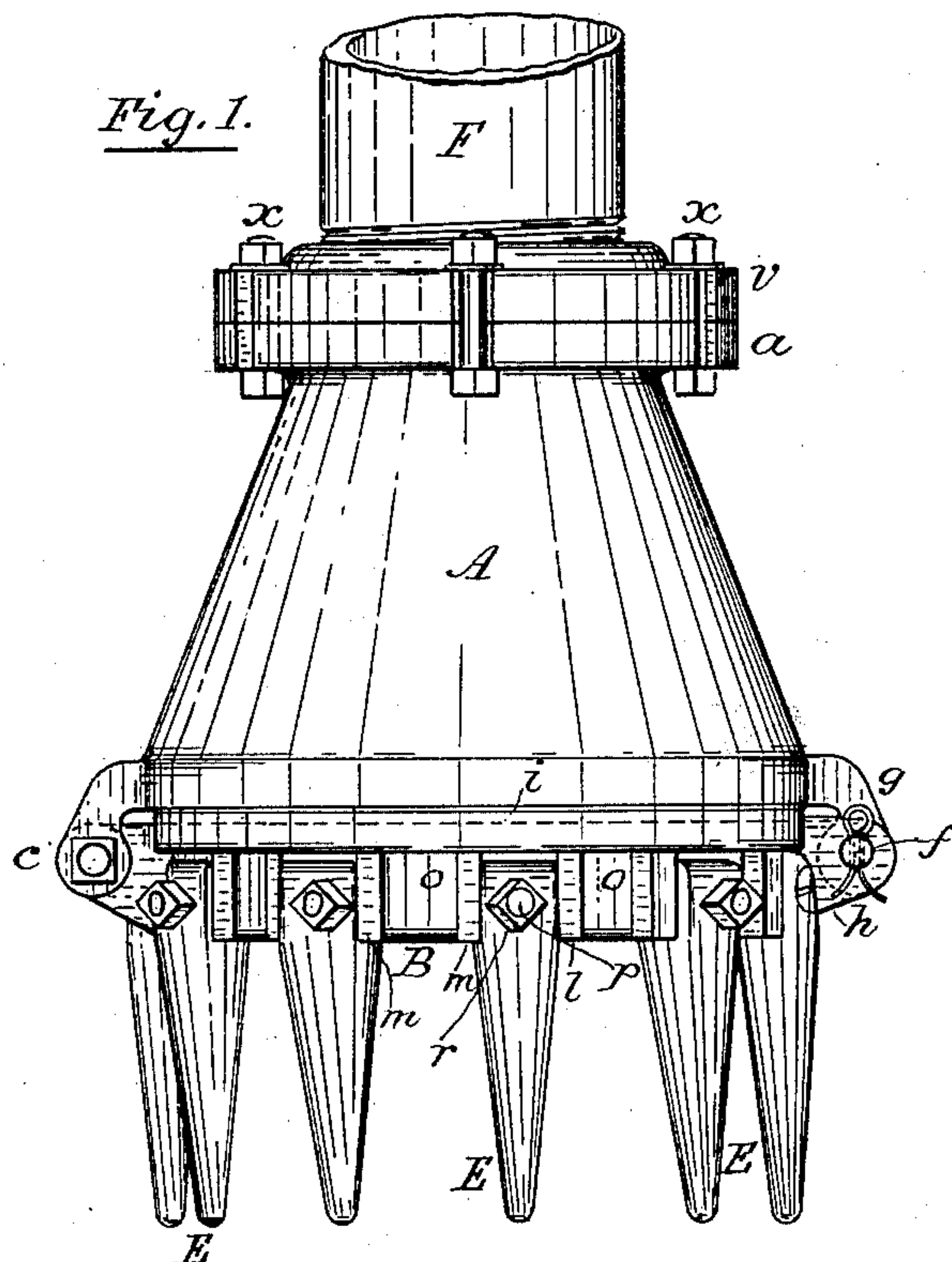
(No Model.)

2 Sheets—Sheet 1.

G. F. BADGER.
DREDGING APPARATUS.

No. 336,619.

Patented Feb. 23, 1886.



WITNESSES

John J. Boardman
Albert P. Moriarty.

INVENTOR

Gardner F. Badger.
By his Attorney
Jacob S. Storer

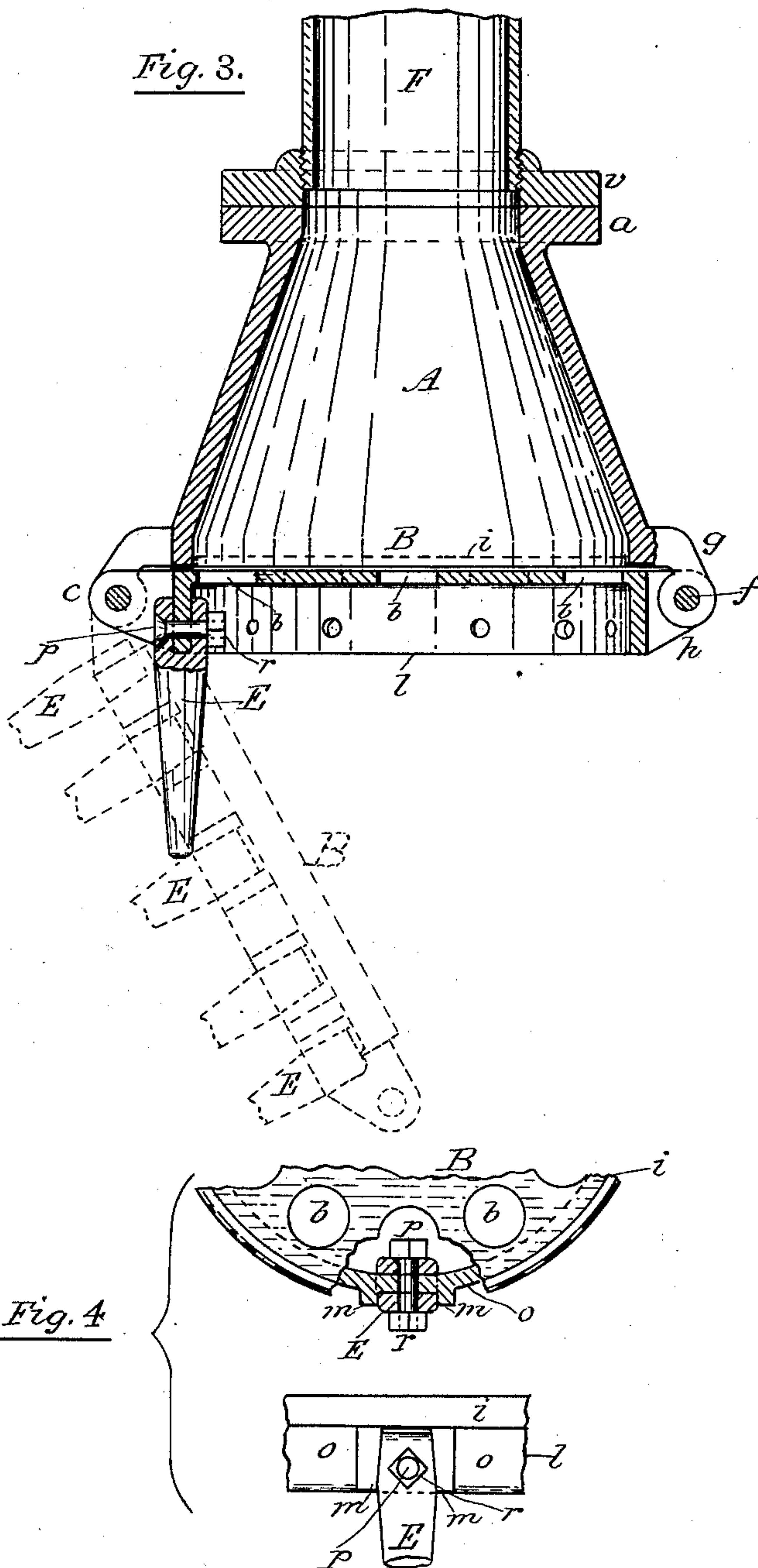
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UNITED STATES PATENT OFFICE.

GARDNER F. BADGER, OF BROOKLYN, NEW YORK.

DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 336,619, dated February 23, 1886.

Application filed December 15, 1884. Renewed December 31, 1885. Serial No. 187,310. (No model.)

To all whom it may concern:

Be it known that I, GARDNER F. BADGER, a citizen of the United States of North America, and a resident of Brooklyn, county of Kings, State of New York, have invented a new and useful Improvement in Dredging Apparatus, of which the following is a specification.

The object of this invention is to provide an improvement in dredging apparatus, by means of which the material to be dredged or excavated may be first stirred and broken up so that it may be more readily removed by the dredging device or apparatus.

The invention is designed more especially to be used with a dredging or excavating pump, and may be called a "combined digger and strainer;" and it consists of a hollow metallic shell, preferably in the shape of a frustum of a cone, flanged at the top for connection with the suction-pipe of a dredging-pump, and having hinged to its bottom, so as to cover the opening thereof, a circular flanged perforated plate, to whose base ring or flange are secured several downward-projecting teeth, which are designed to operate as stirrers, all of which will be hereinafter fully set forth.

Reference is to be had to the accompanying drawings, forming part of the specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved device attached to the suction-pipe of a dredging-pump. Fig. 2 is a plan of the strainer. Fig. 3 is a vertical section of the device. Fig. 4 shows a digging-tooth and its attachment to the base-ring.

In the drawings, A represents the hollow shell of the combined digger and strainer, provided with a laterally-projecting flange, *a*, about its upper edge, and B represents the strainer—a heavy circular plate having numerous perforations, *b*, whose combined area should be about double that of the pump suction-pipe to which this device is to be applied. In this instance these perforations are about two inches in diameter, but they may be made of any suitable area to suit the work to which the service is applied. The plate B is hinged, as shown at *c*, to the shell A, and when closed up in place is so held by a bolt, *f*, which is passed through lugs *g h*, respectively, on the said shell and strainer. On the upper edge of

the strainer-plate is a vertical flange, *i*, which fits against and about the outside of the lower rim of the shell A, when the strainer is closed up, to make a tight joint between the parts, and to assist in holding them rigidly together. A downward-projecting base ring or flange, *l*, is also formed about the edge of the plate B, and on the outer face of this flange or ring *l* are formed alternate ribs *m* and recesses *o*, whose purposes will be hereinafter set forth.

E E represent the stirring or digging teeth, which are made of strong metal, and may be from six to eight inches long, or thereabout. These teeth are tapering to their points, and their strong upper ends are forked or split, so as to straddle the ring *l* between the ribs *m*, and are of a width to fit exactly in the recesses *o* and to bear against the ribs *m*, on either side thereof. They are secured more firmly in place by bolts and nuts *p r*, respectively, as shown. By these means the digging-teeth are held most rigidly to the strainer-plate.

This device is more especially designed to be attached to the suction-pipe (represented at F) of a pulsometer-pump. Said suction-pipe is provided with a flange, *v*, corresponding with the flange *a* of the device itself, and the two are secured together by means of bolts and nuts *x* or other suitable devices.

When dredging with a pulsometer-pump, the pump is suspended by a chain and the combined digger and strainer, attached to the lower end of the pump suction-pipe, bears upon the bottom to be dredged with its whole weight, and, if required, with the superimposed weight of the pump, so that the teeth shall penetrate into the bottom, whether it be of sand, gravel, or clay. The action of the pump when in operation is such as to cause the combined digger and strainer to swing or oscillate over an area, say, of a yard or more, and cause the teeth to break and stir up the bottom, so that it may be rapidly removed by the suction of the pump.

When it occurs (as it rarely does, however) in operating this device that stones, shells, masses of seaweed, grass, or other impediments are sucked up against or into the perforations in the plate B so as to close them, the pump and its attached digger and strainer are raised, so that the latter shall be just above

the water, and an operator then removes the impediments by hand, and, if necessary, throws the plate B open, as indicated in Fig. 3, to drive the stones, shells, &c., out of the perforations from within outward, and then closes and secures the plate in position again, all of which may be done in a minute or two. The combined area of the perforations greatly exceed the area of the suction-pipe, so that the pump may do full work, even if many of the perforations become clogged.

Where a sufficient supply of water can be had to make it operative, this device can be used with great advantage in sinking shafts, wells, &c.

The suction-pipe of a dredging-pump may have fixed on its lower end an enlarged section of pipe, which would be a mechanical equivalent of the shell of the combined digger and strainer herein shown and described, in which case the perforated plate, with its teeth, would be hinged or otherwise attached to the lower end of said suction-pipe.

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

1. A combined digger and strainer for excavating or dredging purposes, constructed substantially as herein shown and described, consisting of a hollow metallic shell adapted for attachment to a suction-pipe, and having secured to its lower rim a flanged perforated plate carrying projecting teeth, as set forth.

2. In a dredging or excavating apparatus, the combination, with the suction-pipe of a pump, of a perforated plate carrying removable projecting stirring or digging teeth, substantially as herein shown and described, said plate being secured on the lower end of the pipe, as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 26th day of November, 1884.

GARDNER F. BADGER.

Witnesses:

JACOB J. STORER,

ALBERT P. MORIARTY.