

No. 656,503.

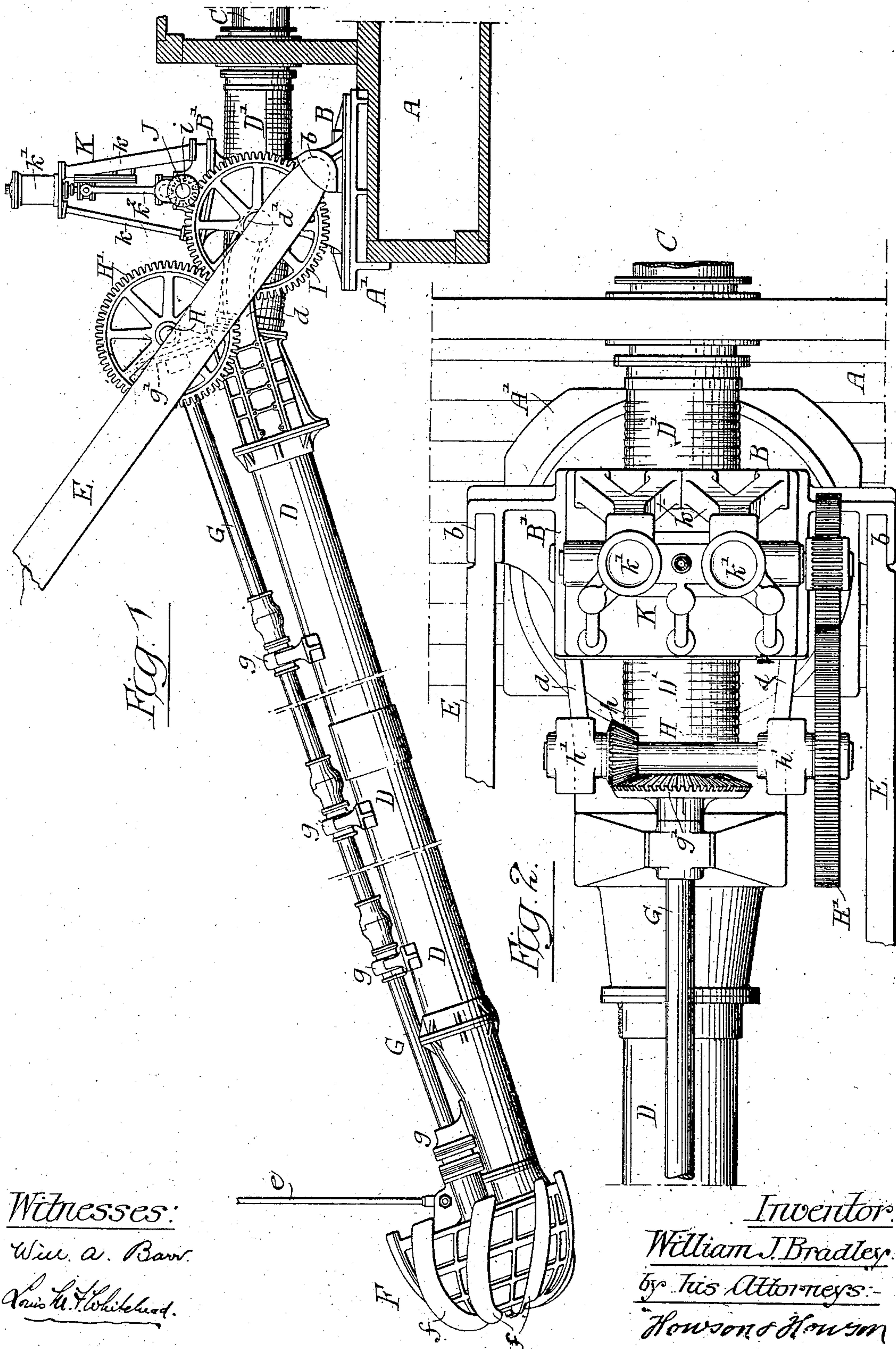
Patented Aug. 21, 1900.

W. J. BRADLEY.  
HYDRAULIC DREDGING APPARATUS.

(Application filed Apr. 28, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
Wm. A. Barr.  
Louis H. Whithead.

Inventor:  
William J. Bradley.  
by his Attorneys:-  
Howson & Howson



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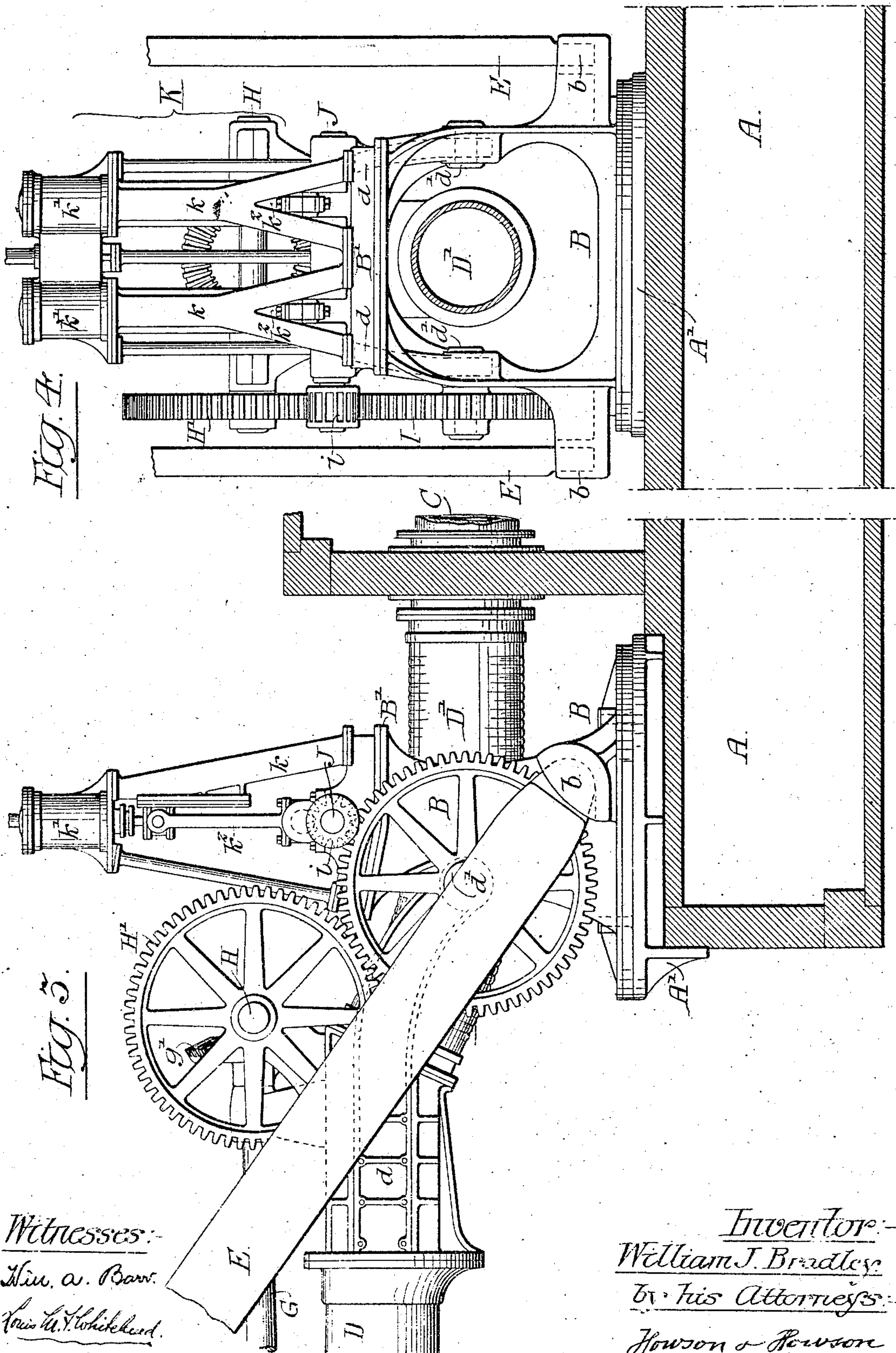
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# UNITED STATES PATENT OFFICE.

WILLIAM J. BRADLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
THE AMERICAN DREDGING COMPANY, OF SAME PLACE.

## HYDRAULIC DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 656,503, dated August 21, 1900.

Application filed April 28, 1900. Serial No. 14,730. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. BRADLEY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Hydraulic Dredging Apparatus, of which the following is a specification.

My invention relates to certain improvements in hydraulic suction dredging apparatus in which a suction-pipe is used in connection with a power-driven cutter for dislodging the material which will pass up the suction-pipe to the pump and from the pump to the scow or other receiver. In the most acceptable form of apparatus used prior to my invention the engine for driving the cutter-head was mounted directly upon the suction-pipe. I found this construction was objectionable for many reasons—namely, that it required a very heavy pipe to withstand the vibration, and in some cases it was necessary to brace the pipe as well as to strengthen the boom, and, furthermore, when the suction-pipe was mounted low on the dredge part of the engine would be under water during the dredging operation.

The object of my invention is to overcome the above-mentioned objections, and this object I attain by mounting the engine directly upon the turn-table and gearing it with the cutter-head shaft carried by the suction-pipe.

In the accompanying drawings, Figure 1 is a side view of sufficient of a dredging apparatus to illustrate my invention, the view showing the bow of the dredge, the suction-pipe, and cutter-head. Fig. 2 is a plan view, drawn to an enlarged scale, illustrating my invention. Fig. 3 is a side view of Fig. 2 with the dredge in section, and Fig. 4 is an end view of Fig. 3 with the dredge in section.

A is the dredge, which may be of the ordinary type, having a fixed suction-pipe C extending to the ordinary suction-pump.

A' is a base-plate firmly secured to the deck of the dredge, and mounted on this base-plate is the turn-table B, to which is pivoted the suction-pipe D. Connecting the suction-pipe D with the fixed suction-pipe C of the dredge is a flexible tubular connection D', one end of which is coupled to the suction-pipe D and the other to the pipe C. This connection is

made of any suitable material, so that it will readily allow for the movement of the suction-pipe D. On each side of this coupling extend arms  $d d$ , which are pivoted at  $d'$  to the frame of the turn-table B, so that as the suction-pipe D is raised and lowered it swings on these pivots.

E E are the booms from which the outer end of the suction-pipe D is suspended by means of a rod  $e$  or a chain. The ends of the booms rest in sockets  $b$  in the turn-table B. Suitable tackle is used for adjusting the booms in the ordinary manner. The turn-table B is mounted so as to turn upon the base-plate and can be fixed in the adjusted position, if desired, and as the booms and suction-pipe are mounted on the turn-table they will turn with it.

At the end of the suction-pipe D is an open cutter-head F, having blades  $f$ . The cutter-head is mounted on the shaft G, carried by bearings  $g$  on the suction-pipe D. As the mud or other material is dislodged by the blades of the cutter-head it will be drawn through the cutter-head and pass up the suction-pipe through the suction-pump to the scow. The particular form of cutter-head shown is claimed in a separate application for a patent filed of even date herewith. It will be understood that any form of cutter-head may be used without departing from my invention.

The upper end of the shaft G has a bevel-wheel  $g'$ , which meshes with a bevel-pinion  $h$  on the cross-shaft H, mounted in bearings  $h'$  on the suction-pipe. On this shaft H is a gear-wheel  $H'$ , which meshes with a gear-wheel I on a shaft or stud in line with the pivot  $d'$  of the suction-pipe D, so that no matter in what position the suction-pipe may be the wheels I and  $H'$  will always be in gear.

The wheel I meshes with a pinion  $i$  on the crank-shaft J of a steam-engine or other motor K, mounted on the platform B' of the turn-table B. The engine in the present instance is a two cylinder steam-engine having a frame  $k$ , cylinders  $k'$ , and connecting-rods  $k^2$ , coupled to the crank-shaft J.

It will be seen that I am enabled to support the engine on the turn-table, which can be firmly mounted upon the foundation-plate of the dredge and which will only be moved



when the table is turned on the base-plate, and, furthermore, the engine is at all times within easy reach of the engineer, the steam being conveyed to the same through an over-  
 5 head pipe with a swivel-joint, thus dispensing with flexible steam-couplings. By mounting the engine on the turn-table as described instead of mounting it upon the suction-pipe several advantages are gained. The vibra-  
 10 tion of the suction-pipe is entirely dispensed with, as I have found that when an engine was mounted on the suction-pipe the vibration was so great that it was liable to strain the pipe as well as loosen the bearings of the  
 15 shaft and a heavy pipe had to be used, and it was sometimes necessary to brace this pipe as well as to strengthen the boom, and when the engine was mounted on the pipe and the suction-pipe hung low on the dredge some  
 20 parts of the engine would be in the water during the operation of the dredge, which was objectionable. By my invention I am enabled to decrease the weight of the pipe and use an ordinary boom, there is no vibration of the  
 25 pipe due to the working of the engine, and the engine is clear of the water.

I claim as my invention—

1. The combination in a dredging apparatus, of a turn-table, a suction-pipe pivoted  
 30 to the turn-table, a shaft mounted on the suction-pipe, a cutter-head carried by said shaft, a gear-wheel in line with the pivots of the suction-pipe, an engine mounted on the frame and geared to the gear-wheel, said gear-wheel  
 35 in turn being geared to the cutter-head shaft, substantially as described.

2. The combination in a dredging apparatus, of a base-plate secured to the deck of the dredge, a turn-table mounted so as to turn  
 40 on the base-plate, an engine or motor carried by the turn-table, a suction-pipe pivoted to the frame of the turn-table, a shaft having

its bearing on the suction-pipe, a cutter-head on one end of said shaft, a gear-wheel in line with the pivot of the suction-pipe and geared  
 45 to the engine and to the cutter-head shaft, the movable suction-pipe being connected to the fixed suction-pipe on the dredge, substantially as described.

3. The combination of a base-plate, a turn-  
 50 table mounted so as to turn thereon, a suction-pipe pivoted to the frame of the turn-table, a shaft mounted in bearings on the suction-pipe, a cutter-head mounted on one  
 55 end of the shaft, bevel-gear at the other end of the shaft, a cross-shaft having a pinion meshing with the bevel-gear, a gear-wheel on said shaft, a gear-wheel mounted on the turn-  
 60 table at the pivot-point of the suction-pipe, and meshing with the aforementioned gear-wheel, and an engine or motor mounted on the turn-table, a pinion on the driving-shaft of said engine or motor meshing with the gear-  
 wheel, substantially as described.

4. The combination of the base-plate, a  
 65 turn-table mounted on said base-plate, said turn-table having an open center and having a platform at the top, an engine or motor mounted on said platform, a suction-pipe pivoted to the turn-table and having a flexible  
 70 extension passing through the open center of the turn-table under the platform and connected to the suction-pipe of the dredge, a cutter-shaft, and a cutter on the end of said  
 75 shaft, said cutter-shaft being geared to the engine on the platform, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM J. BRADLEY.

Witnesses:

WILL. A. BARR,  
 JOS. H. KLEIN.