No. 607,237. Patented July 12, 1898.

F. H. HEATH.

SUCTION DREDGE.

(Application filed Sept. 11, 1897.)

(No Model.)

FIG. 1.

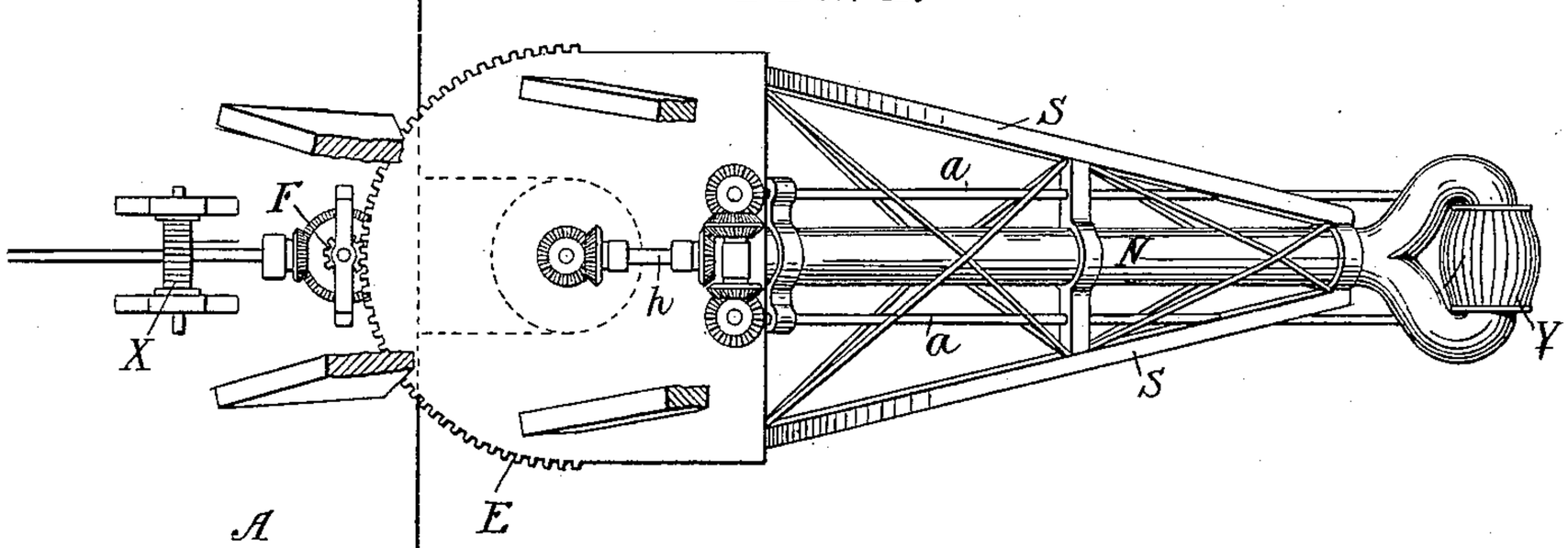

FIG. 2.

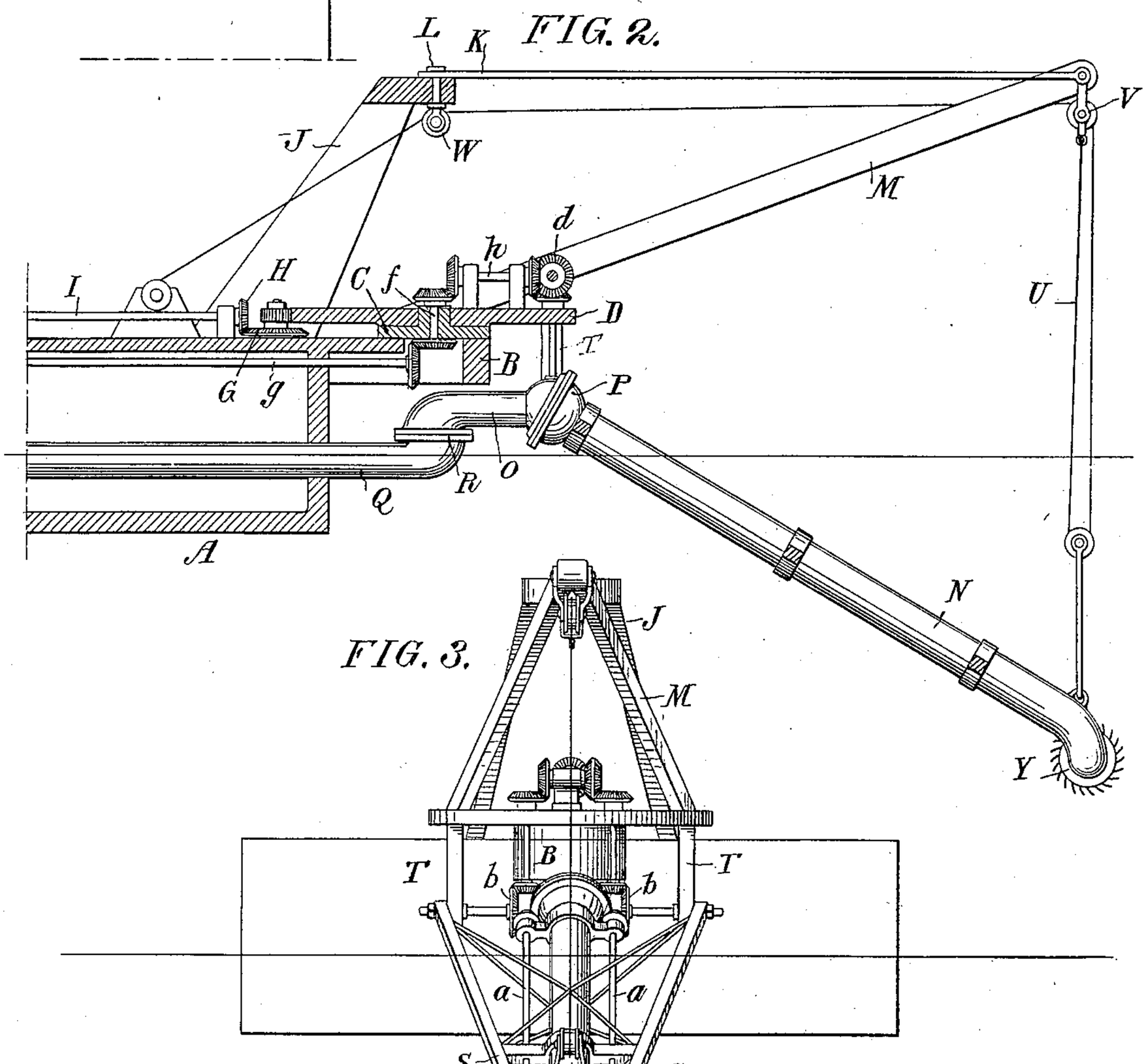

FIG. 3.

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UNITED STATES PATENT OFFICE.

FREDERICK H. HEATH, OF TACOMA, WASHINGTON.

SUCTION-DREDGE.

SPECIFICATION forming part of Letters Patent No. 607,237, dated July 12, 1898.

Application filed September 11, 1897. Serial No. 651,366. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK H. HEATH, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a certain new and useful Improvement in Suction-Dredges, of which the following is a specification.

My present invention relates to new and useful improvements in suction-dredges, and has for its object to simplify such apparatus, increase its efficiency, and generally to improve upon the construction shown and described in my former application for Letters Patent, Serial No. 643,070.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth, and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a portion of a dredger-boat, the derrick-tower being broken away, so as to more clearly show the turn-table and mechanism for operating the same; Fig. 2, a longitudinal section of the turn-table and dredger-boat, showing the connection between the suction-pipe and said boat; and Fig. 3, a front view of the apparatus.

In carrying out my invention as here embodied, A represents the front end of a dredger-boat of any suitable design, having projecting therefrom the extension B, upon which is secured the circular block C, and this block has mounted thereon the turn-table D, which is of such size and shape as to serve as a platform for the support of the various parts of the mechanism which are to swing in unison with the excavator; and upon the circular edge of the turn-table are a series of gear-teeth E, with which the pinion F meshes, said pinion being secured upon a short shaft with a beveled gear G, and the beveled pinion H, meshing with this last-named gear, imparts motion thereto, whereby the turn-table may be oscillated upon its axis, for the purpose hereinafter set forth. The beveled pinion H is secured upon the shaft I, which is operated by a suitable reversible motor.

A tower-frame J is mounted upon the dredger-boat and overhangs the turn-table, so that the rod K may be attached thereto, as indicated at L, directly over the vertical axis of the turn-table in order that when the latter is oscillated this rod may swing in unison therewith without affecting the tower-frame, and the edge of this rod is to support the outer end of the derrick M, which is mounted upon the turn-table, as clearly shown. This arrangement is for the proper support of the outer end of the dredger-pipe N, as will be hereinafter set forth.

The dredger-pipe is connected to the suction-pipe O by means of a globe-joint P in order that it may be raised and lowered for determining the depth of operation of the excavator, and the pipe O in turn is swiveled to the pipe Q by an enlarged joint R, the pipe Q leading to a suitable pump for elevating the material excavated; but as this pump forms no part of my present invention I have not here shown nor will I describe the same, since such a pump is fully set forth in my United States application, Serial No. 632,920.

Truss-arms S are attached to the hangers T, depending from the turn-table, and so stayed by suitable rods and braces and connected with the excavator as to withstand the side strains and thrust brought to bear upon said excavator, thereby completely relieving the dredger-pipe N and its couplings from these strains, and the outer end of this trusswork is supported by the tackle U, the line of which passes over the pulley V, depending from the outer end of the derrick, and, extending rearward, also passes over the pulley W, which latter is swiveled upon the vertical axial line of the turn-table, preferably by a ball-socket arrangement, so as to freely accommodate itself to the movements of said turn-table. This line then passes downward to the drum X, which latter is connected in any suitable manner to a motor for its proper operation.

The excavator Y, which is carried at the outer end of the dredger, is preferably of the construction shown in my allowed application for Letters Patent, Serial No. 632,919, and is given its proper rotation by the rods *a*, carry-

ing pinions at their upper ends, which mesh with the beveled gears *b*, these in turn receiving their motion from the nest of gears *d*.

A short shaft *f* is journaled in the center of the block C and has a beveled gear upon both ends thereof, by which power is transmitted from the shaft *g* to the shaft *h* and thus to the nest of gears *d*. This arrangement permits the free swinging of the excavator while it is being revolved, since the power is transmitted from the boat to the center of the movement of the turn-table.

From this description it will be seen that an exceedingly simple truss is provided for excavation and that the movements of the excavator are at all times under perfect control of the occupants of the boat without the use of guide-ropes, and this is a decided advantage, since the operations of the dredge are thereby made more positive and do not require the staking of anchors and tackle at considerable distances from the excavator for drawing it back and forth, which, under some circumstances, is next to impossible; but by my present improvement the entire apparatus and its operating mechanism are supported by the dredger-boat, which facilitates the operation thereof and also permits the excavator being swung through a greater arc.

Having thus fully described this invention, what I claim as new and useful is—

1. In combination with a dredging-boat, a suction-pipe flexibly connected therewith, a turn-table mounted on said boat, an operating-shaft run through the pivotal connection of said turn-table, a bevel-gear carried by said shaft, an excavator rotatably mounted in the end of said pipe, means for operating said excavator from said gear, and a derrick on said turn-table for supporting the outer end of said pipe, substantially as shown and described.

2. A dredge, consisting of a dredger-boat, an extension carried thereby, a turn-table mounted upon said extension, means for oscillating said table, a derrick carried by the turn-table, a tower-frame carried by the boat and swivelly connected with the derrick, a suction-pipe carried by the boat, a dredger-pipe flexibly connected therewith, an excavator carried by the outer end of the dredger-pipe, a truss-frame attached to the turn-table for assisting the strains transmitted to the excavator, and suitable tackle carried by the derrick for supporting the outer end of the dredger-pipe, substantially as shown and described.

3. In combination with a dredger-boat of the character described, a turn-table mounted upon an extension thereof, a derrick carried by said table, a tower carried by the boat and swivelly connected by means of a rod to said derrick, and a dredging apparatus, the outer end of which is supported by suitable tackle passing over the derrick, substantially as and for the purpose set forth.

4. In combination with a dredger-boat, and an excavating apparatus swivelly connected therewith, a turn-table mounted upon an extension of the boat, a derrick carried by said turn-table, a tower-frame swivelly connected with said derrick, a tackle supported by the derrick and connected with the excavating apparatus, and means for operating said tackle, substantially as shown and described.

5. In combination with a dredger-boat of the character described, a turn-table mounted upon an extension thereof, a suction-pipe carried by said boat, a dredger-pipe flexibly connected with the first-named pipe, an excavator carried by the outer end of the dredger-pipe, and a truss-frame pivoted to the turn-table and adapted to assist the strains brought to bear upon the excavator, as specified.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

FREDERICK H. HEATH.

Witnesses:

S. S. WILLIAMSON,

H. K. MOORE.