

(No Model.)

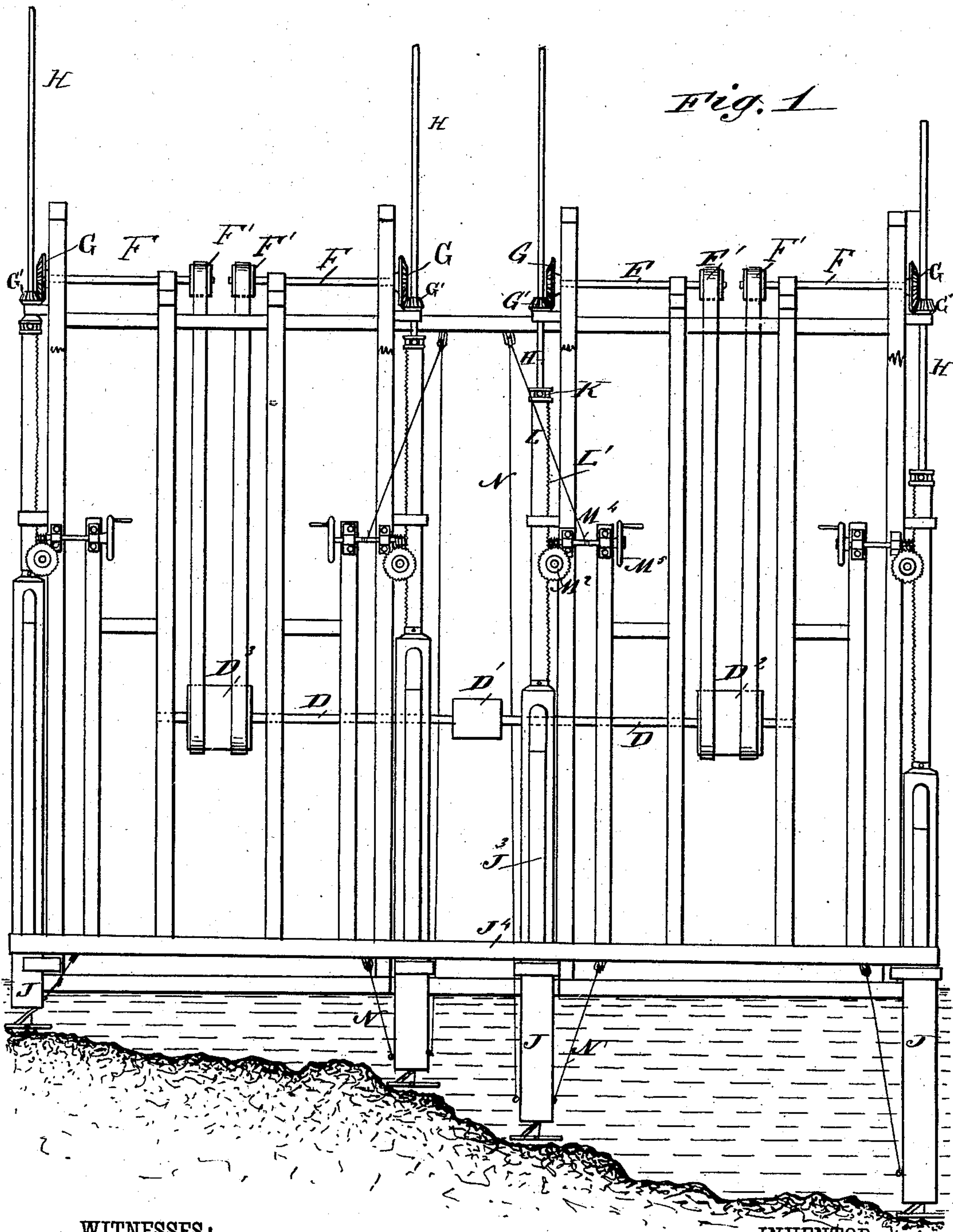
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H. O. GEIGER.

DREDGE.

No. 368,884.

Patented Aug. 23, 1887.



WITNESSES:

C. Neveu
C. Sedgwick

INVENTOR:

H. O. Geiger
BY *Munn & Co*
ATTORNEYS.

(No Model.)

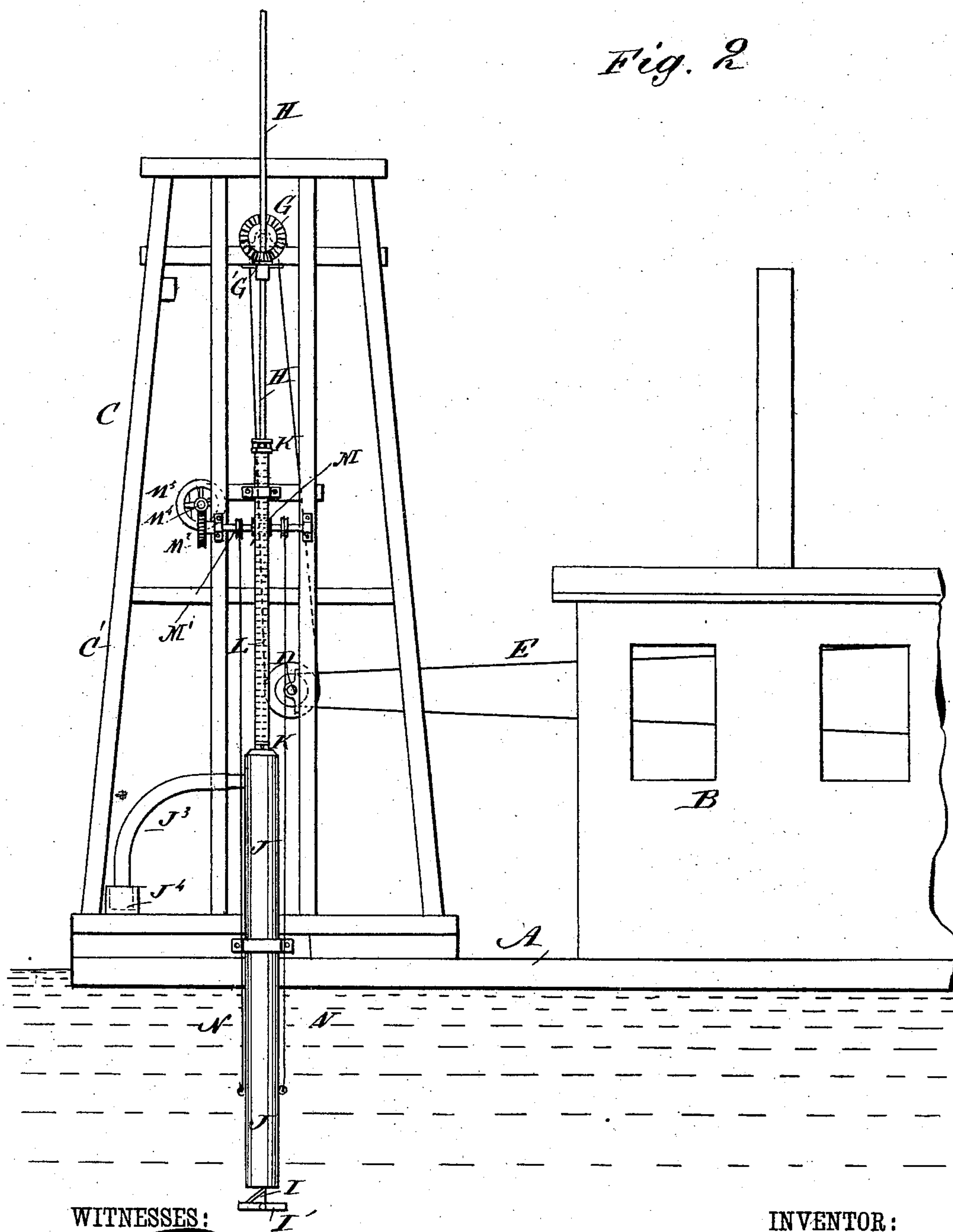
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Fig. 2



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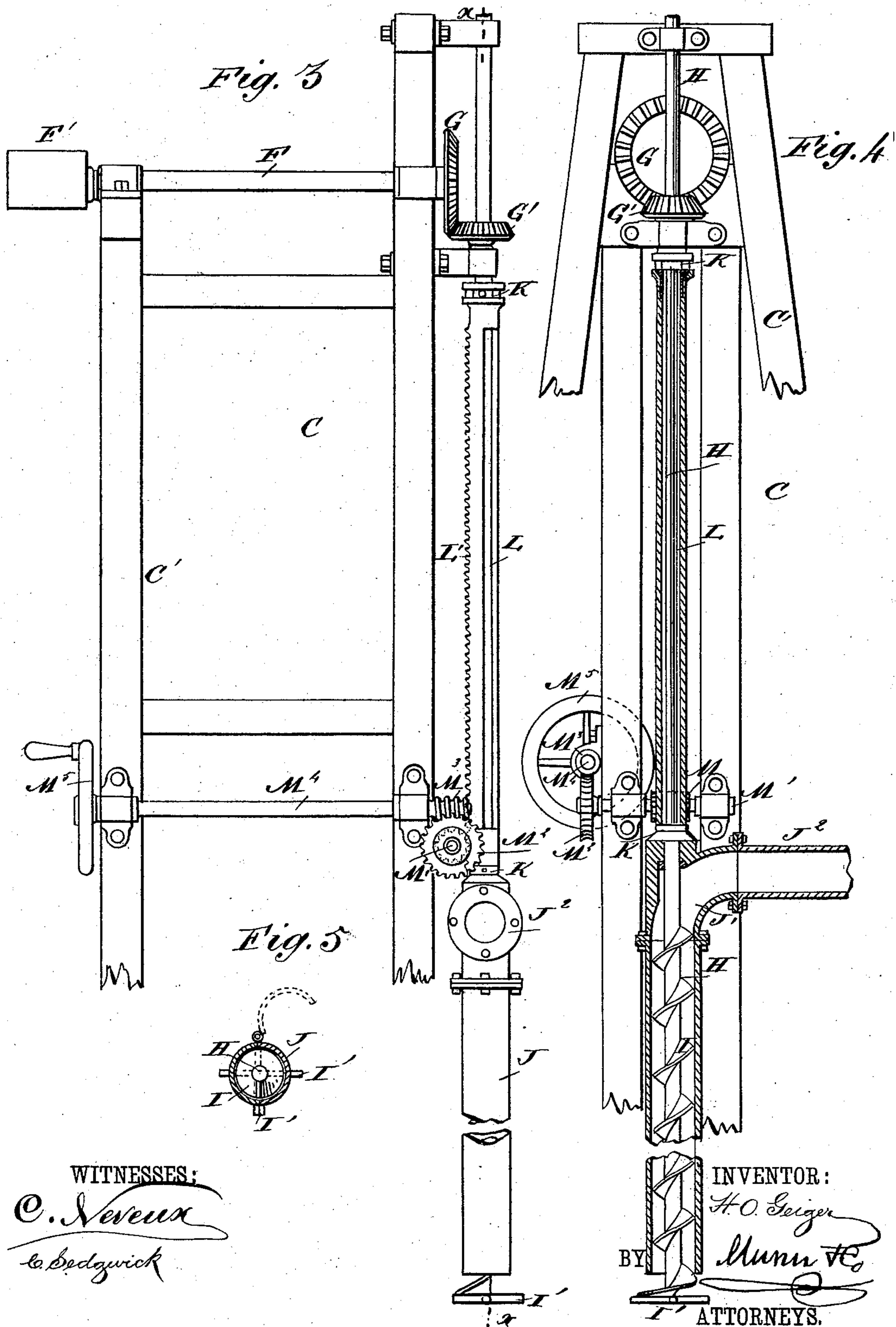
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UNITED STATES PATENT OFFICE.

HENRY O. GEIGER, OF TACOMA, WASHINGTON TERRITORY.

DREDGE.

SPECIFICATION forming part of Letters Patent No. 368,884, dated August 23, 1887.

Application filed March 23, 1886. Serial No. 196,250. (No model.)

To all whom it may concern:

Be it known that I, HENRY O. GEIGER, of Tacoma, in the county of Pierce, Territory of Washington, have invented a new and Improved Dredge, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved dredge for removing clay, mud, or sand obstructions in harbors or rivers.

The invention consists of the combination of parts, including their construction, substantially as hereinafter set forth.

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

Figure 1 is an end elevation of my improved dredge, showing four suction-pipes operating at different depths in a river or harbor. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation of part of my dredge. Fig. 4 is a sectional side elevation of the same on the line $x x$, Fig. 3. Fig. 5 is a detail sectional plan view of the suction-pipe.

The scow A is provided with an engine-house, B, containing the machinery for operating my dredges C, which are mounted, near one end of the scow A, on suitable frame-work, C', and operated from one main shaft D, provided with the pulleys D', D², and D³, of which the pulley D' is connected to the machinery in the engine-house B by a belt, E, while the pulleys D² and D³ impart a rotary motion to the driving-shaft F—one for each dredge C—by pulleys F' and belts or other suitable means.

As all of the several dredges C are alike in construction and operation, it will suffice to describe one.

The shaft F is provided on one end with a bevel gear-wheel, G, which meshes into a bevel gear-wheel, G', mounted on a shaft, H, in such a manner as to rotate the same and permit an up-and-down motion of said shaft. The lower portion of the shaft H is provided with an Archimedean screw, I, fastened to the shaft H in sections by screws or other suitable means. The lower end of the shaft H is also provided with cutting blades I', which agitate and cut through hard substances. The screw I is inclosed in the suction-pipe J, open at its bottom, below which the screw is considerably en-

larged, as shown in Fig. 4, and said pipe J is provided on its upper end with an elbow, J', which connects with an arm, J², at right angles to the pump-tube, on which is placed a flexible tube, J³, which leads to a trough, J⁴, secured on the frame-work C' of the dredge. The shaft H is provided with two collars, K K, between which is placed a tube, L, provided with a rack, L', on one side, which meshes into a pinion, M, secured to a shaft, M', provided on one outer end with a worm-wheel, M², into which meshes the worm M³, secured to a shaft, M⁴, mounted in suitable bearings on the dredge-frame C', and provided on its other end with a hand-wheel, M⁵.

The suction-pipe J is supported by means of ropes N, running over pulleys and leading to the shaft M⁴, or to pulleys M⁶, secured upon said shaft, and of the same size as the pitch of the teeth of the pinion M, and which ropes act as guys, relieving the pinion of its weight.

The operation is as follows: Motion being imparted to the main shaft D from the machinery in the engine-house by means of the belt E, each of the dredges is operated by its connection with the pulleys D² and D³, as above stated, so as to rotate the shaft F. The latter imparts a rotary motion to the vertical shaft H and the Archimedean screw I by means of the bevel gear-wheel G, meshing into the pinion G'. The rotation of the Archimedean screw agitates the sand, clay, or mud in such a manner that it is forced to ascend in the suction-tube J, and through the flexible tube J³ into the trough J⁴, from which it may be conveyed to any suitable receptacle. The suction-pipe J is raised or lowered by turning the hand-wheel M⁵, which rotates the shaft M' by means of the worm M³, meshing into the worm-wheel M², and the said shaft M' imparting an up-and-down motion to the pipe L and the suction-pipe J by means of the pinion M, meshing into the rack L'. The suction-pipe is lowered to the bottom of the river or harbor to be dredged, and the rotation of the Archimedean screw inside of the suction-pipe J and the cutting of the cutters I' remove the obstructions in the river or harbor. Any one of the dredges C may be stopped at will, and each pipe J can be raised or lowered independently of the others. The suction-pipe J is made in halves, as shown in Fig. 5, so that it may be

opened to examine the Archimedean screw or clean the same, if necessary.

For repairs or transportation of the dredges, the bearings of the shaft H are displaced, so as to permit of unshipping the suction-pipe and its attachments to be stored on the scow.

Experiments have proved that in ordinary sand or mud the suction of the suction-pipe J on the bed of the river or harbor extends around the suction-pipe in a circle having a radius of about six times the diameter of the suction-pipe J or its cutter I'. In the beds of many of our rivers are rich gold-bearing sands which may be raised and emptied by my improved dredges into ordinary sluice-boxes, so as to save the gold by the ordinary process of sluicing.

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

1. The combination, with the suction-pipe provided with an outlet and the pipe having extending along its length a rack, of the shaft arranged within the latter pipe and provided with an Archimedean screw and the mechanism for raising and lowering the said pipe and shaft with its screw, comprising the worm-shaft engaging a pinion secured upon a shaft carrying an additional pinion gearing with the said rack, substantially as and for the purpose set forth.

2. The combination, with the suction-pipe provided with an outlet and the pipe having extending along its length a rack, of the shaft arranged within the latter pipe and provided with an Archimedean screw, the mechanism for vertically adjusting the said pipes and shaft with its screw, comprising the worm-shaft engaging a pinion secured upon a shaft carrying an additional pinion gearing with the said rack, and pulleys and belts connecting the suction-pipe with the said worm-shaft, substantially as and for the purpose set forth.

3. In a dredge, a suction-pipe having an outlet near its upper end, a shaft provided with an Archimedean screw which is inclosed in the said suction-pipe, a beveled gear-wheel rotating the said shaft and permitting an up and-down motion of the same, and a pipe provided with a rack, in combination with a beveled gear-wheel meshing into the beveled gear-wheel on the screw-shaft and mounted on a shaft operated from the main driving-belt, and with a pinion meshing into the rack on the pipe and mounted on a shaft rotated by a worm-wheel, and a worm mounted on a shaft turned by a hand-wheel, substantially as herein shown and described.

HENRY O. GEIGER.

Witnesses:

WM. G. PETERS,

JOSEPH H. HOUGHTON.