

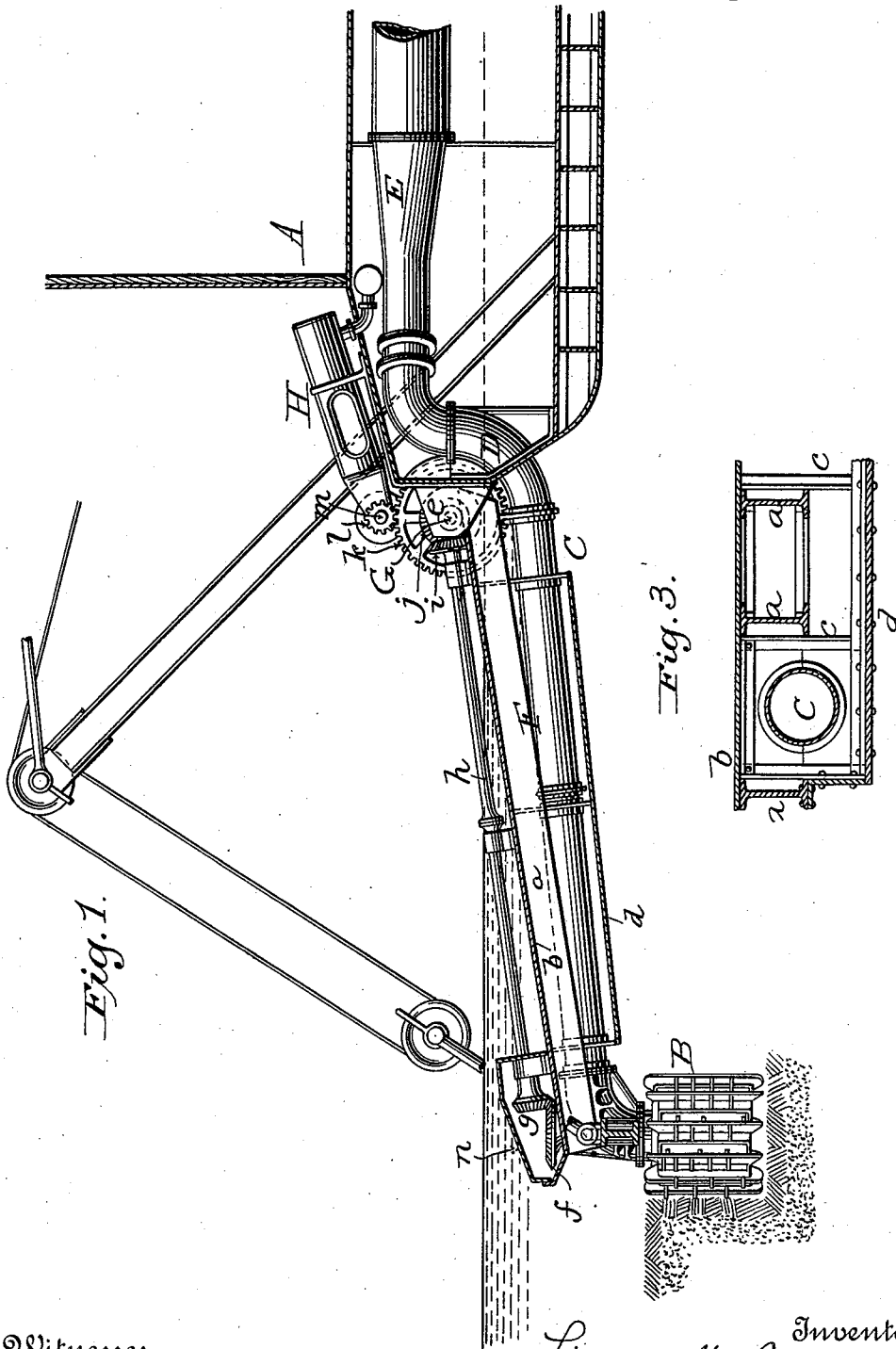
(No Model.)

6 Sheets—Sheet 1.

L. W. BATES.
DREDGER.

No. 545,762.

Patented Sept. 3, 1895.



Witnesses
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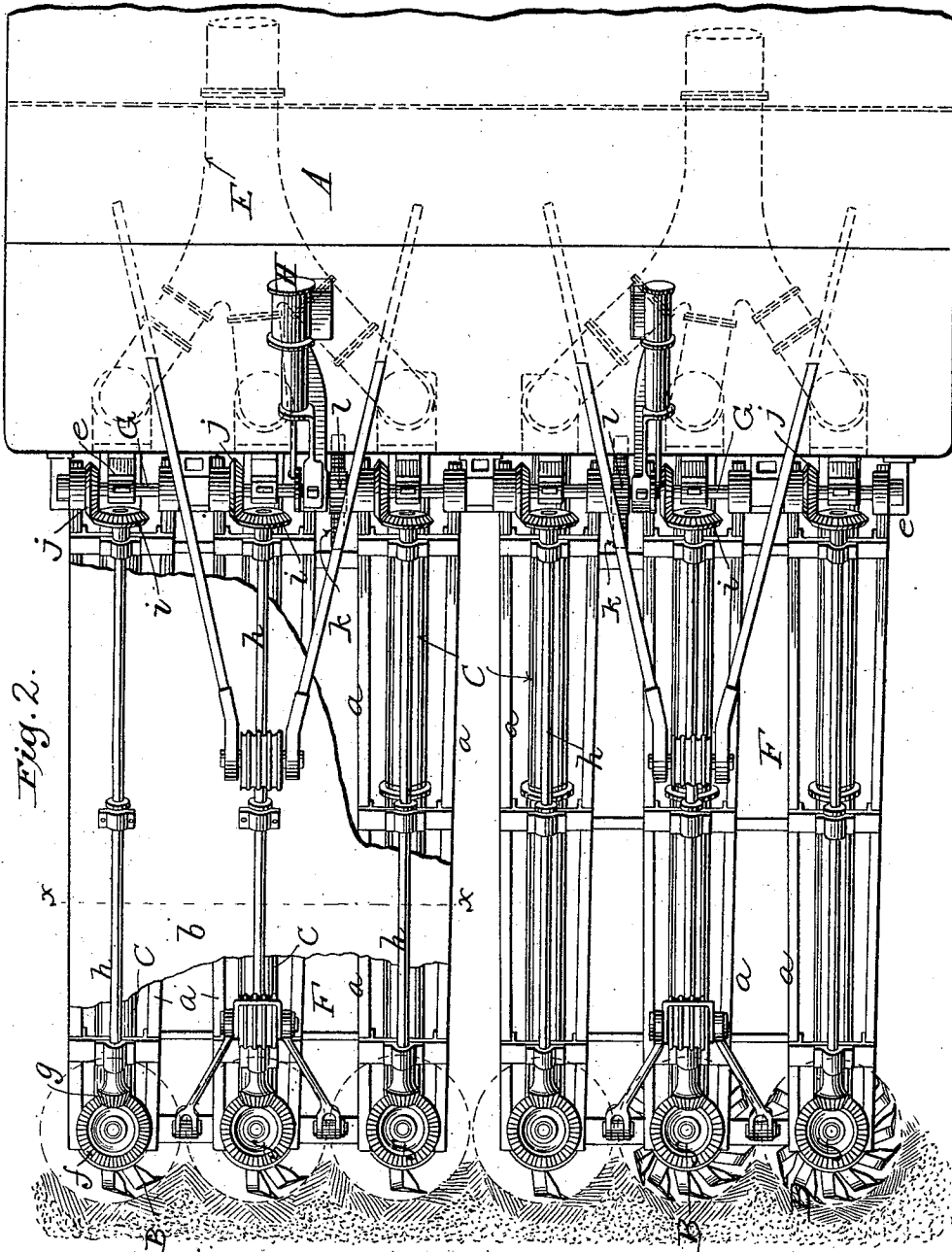
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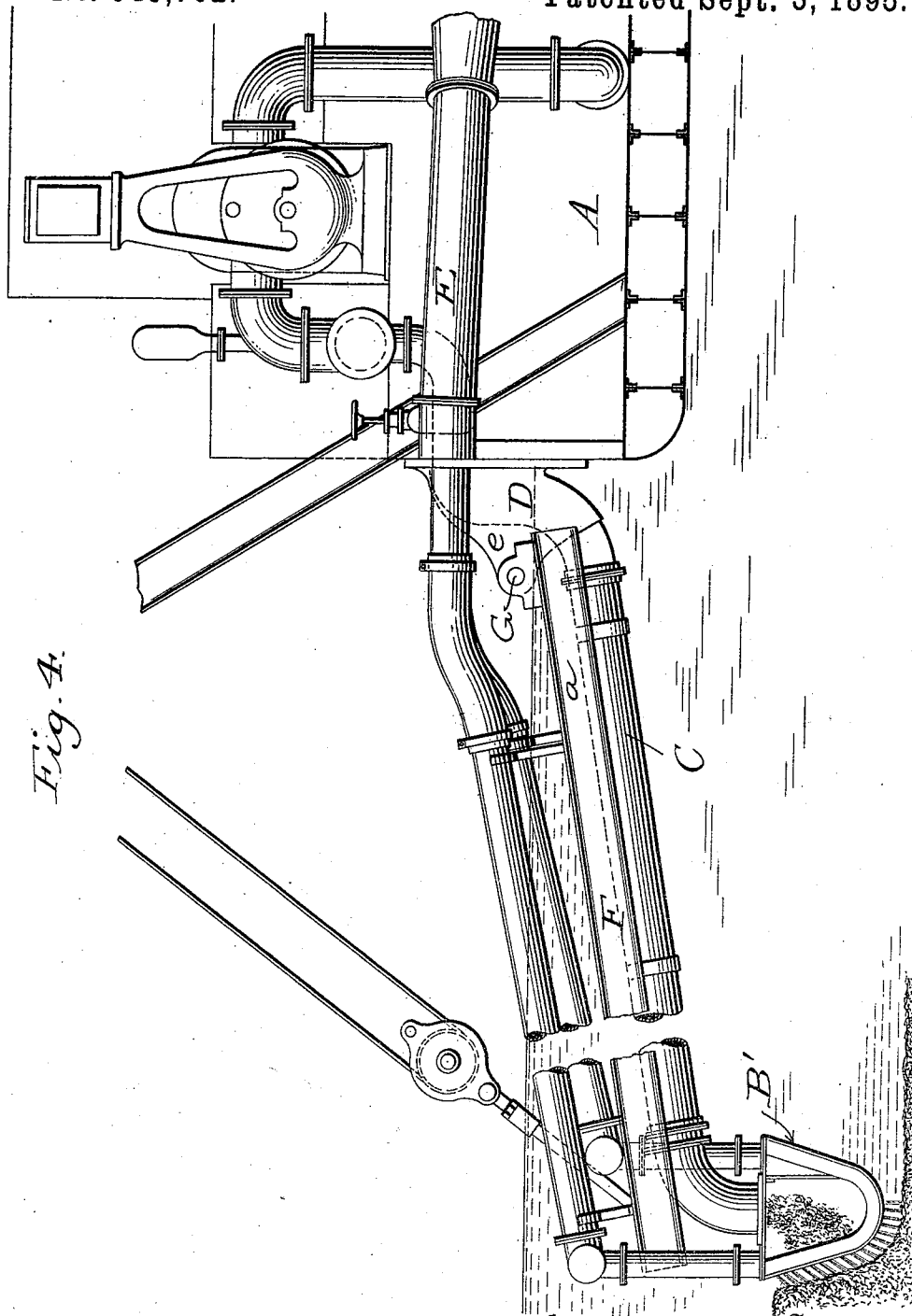
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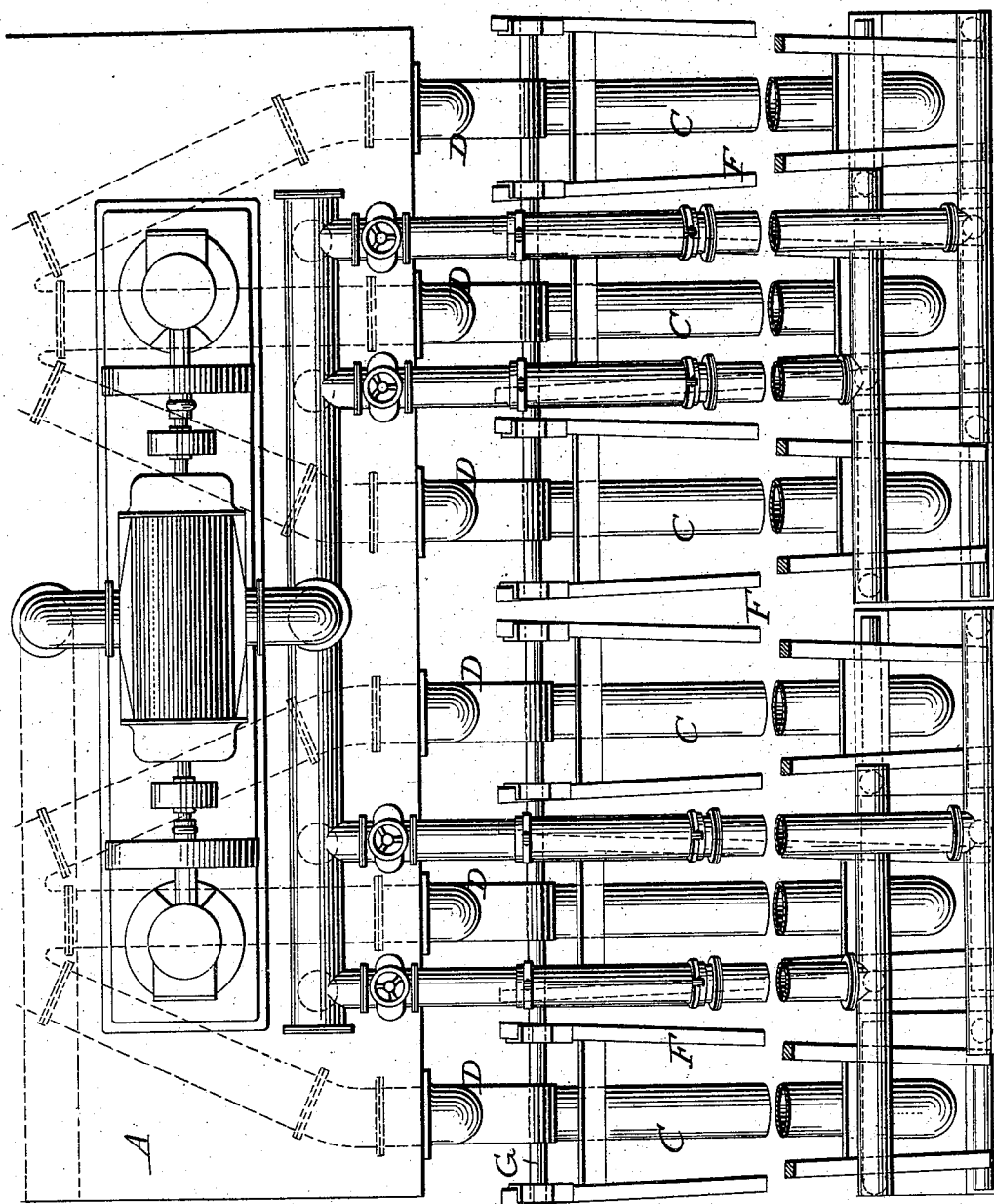


Fig. 5.

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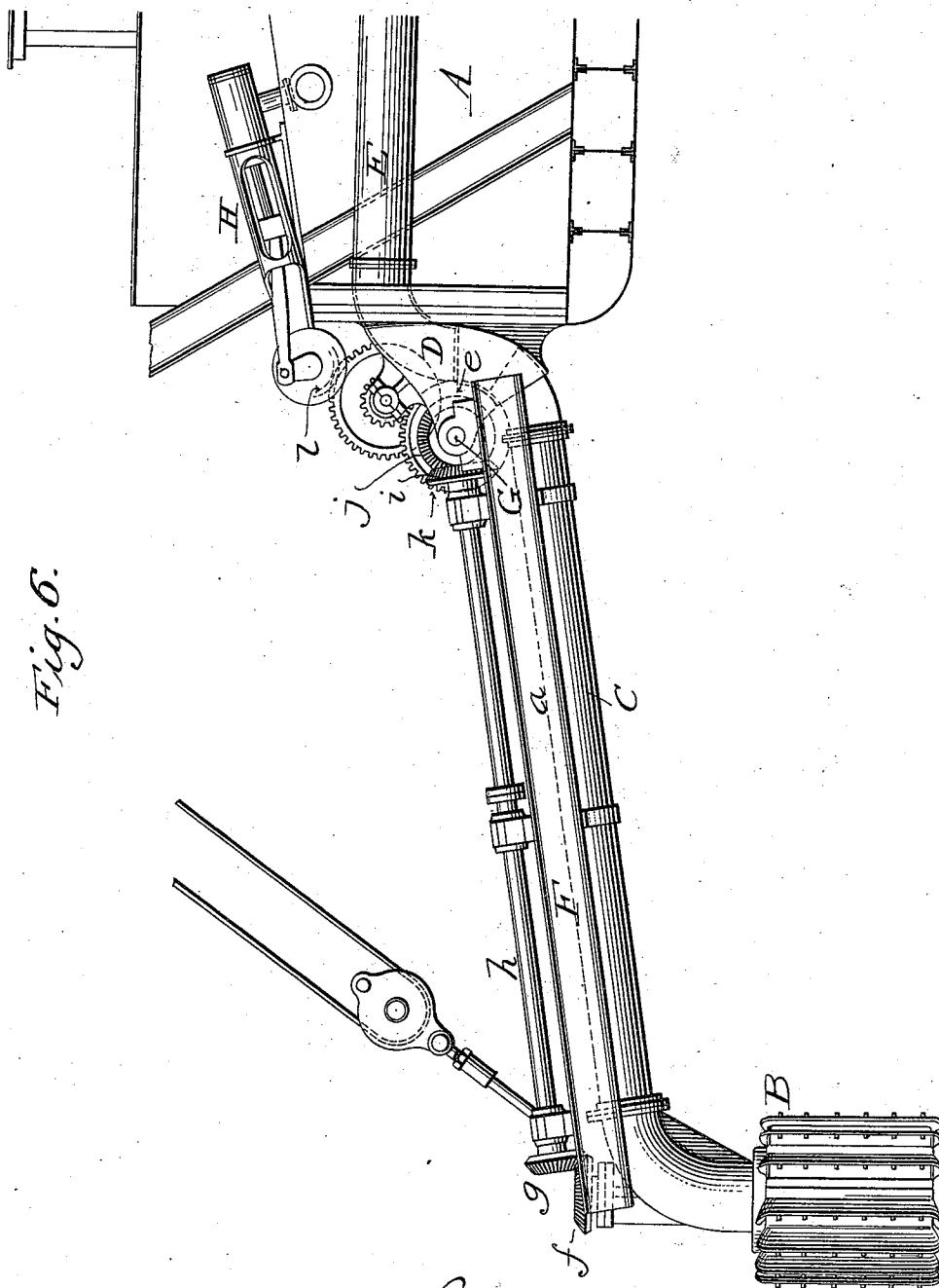
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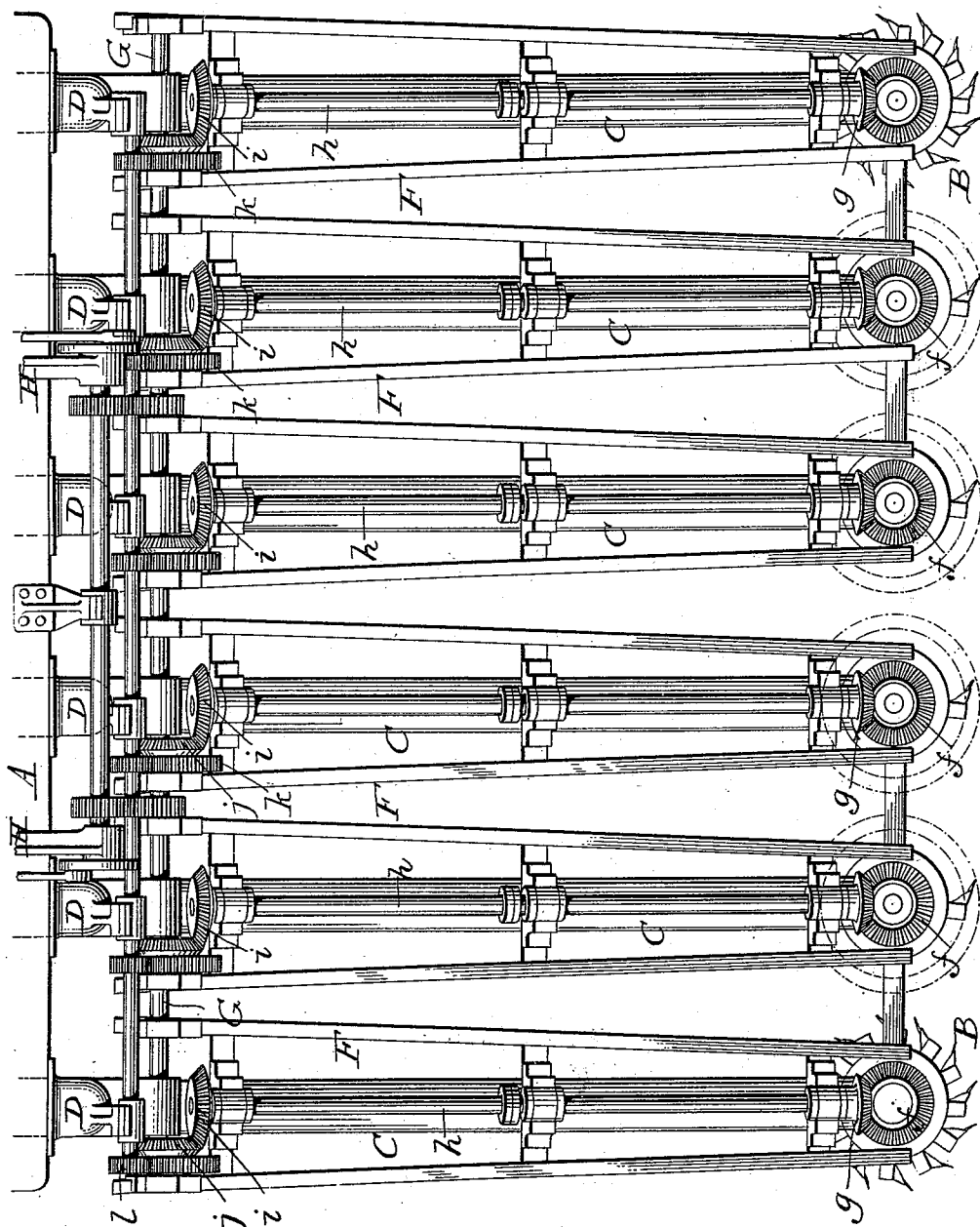
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6 Sheets—Sheet 6.

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Fig. 7.

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UNITED STATES PATENT OFFICE.

LINDON W. BATES, OF CHICAGO, ILLINOIS.

DREDGER.

SPECIFICATION forming part of Letters Patent No. 545,762, dated September 3, 1895.

Application filed March 4, 1895. Serial No. 540,525. (No model.)

To all whom it may concern:

Be it known that I, LINDON W. BATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dredgers, of which the following is a specification.

My invention relates to dredgers, and has reference more particularly to that class of dredgers in which the material excavated is removed by means of pumps which suck or force the material through a pivoted "suction-pipe."

In the drawings, Figure 1 is a side elevation, partly in section, of the bow of a dredger with my improvements applied thereto; Fig. 2, a plan view of the same; Fig. 3, a vertical transverse sectional view on the line 3 3 of Fig. 2, and Figs. 4, 5, 6, and 7 views illustrating modifications.

A indicates the dredge or boat, which is provided at the bow, or it may be at the stern, with a battery of excavators, comprising two or more groups of pivoted excavating devices adapted and arranged to be raised and lowered at their outer ends, either independently or together, and to be held in their adjusted positions during the travel or movement of the boat. These excavating devices may be cutters B, Figs. 1, 2, 6, and 7—such, for instance, as shown in my Patent No. 526,514, dated September 25, 1894—or hollow yokes or frames B', to receive and discharge water under pressure, as in my pending application, Serial No. 532,984, filed December 26, 1894. In said application the said frames or yokes are claimed specifically, and they are illustrated here, Figs. 4 and 5, merely for the purpose of showing that they may be used as a substitute for the cutters in carrying out the present invention.

The cutters or other excavating devices loosen up the material, and the latter is drawn into the suction-pipes C, the opposite ends of the said pipes being curved and fitting into curved elbows D on the discharge-pipe E, thereby forming a telescopic joint, which permits the ladders F, in which the suction-pipes are mounted, to be raised and lowered as desired. These ladders F will each preferably be composed of a series of parallel beams *a*, connected at the top by a plate *b* and irons *c*,

which are secured to the beams and connected at their lower ends by a plate or plates *d*, thus firmly uniting the beams and holding them in proper position relatively to each other and to the suction-pipes between them.

The ladders are hung or pivoted at their inner ends upon shafts G G, carried in brackets or hangers *e*, secured to the bow of the boat, and they are adapted to be raised and lowered by means of the hoisting machinery shown or any other suitable mechanism. Each cutter-shaft carries a bevel-gear *f*, which meshes with a similar gear *g* on a shaft *h*, extending lengthwise of the ladder, said shaft having at its inner end a bevel-gear *i*, which in turn meshes with a corresponding gear *j* on the shaft G. There is also secured to each shaft G a spur-pinion *k*, and motion is imparted to this shaft through its gear *k* and the smaller gear *l* from or by an engine H, said smaller gear *l* being secured to a short shaft *m*, mounted in bearings preferably carried by the engine-frame. I prefer to employ two independent shafts G and independent engines H; but it is obvious that a single shaft may be substituted for the two shafts and one or both engines connected thereto. The gears *f* and *g* will advisably be inclosed by a hood or covering *n*, while the cutter-shaft and its bearings will be so constructed that the end-thrust or weight of the cutter and shaft will be supported by a body of water forced in under pressure.

The curved elbows D, into which fit the suction-pipes, are located within the hull of the boat, as shown in Figs. 1 and 2, and being formed or provided with footings or flanges, which are secured to the hull, materially stiffen and brace the latter. The formation of the discharge-pipes E will vary according to the number of cutters employed. In practice I prefer to employ six cutters, arranged in two groups of three each, and as there is a suction-pipe for each cutter the discharge-pipes, of which there will be two, will each be provided with three arms or branches, as shown in dotted lines in Fig. 2.

Instead of locating the telescopic joint inside the hull, as in Figs. 1 and 2, it may be located outside thereof, as in Figs. 4, 5, 6, and 7. This modified arrangement I consider inferior to that illustrated in Figs. 1 and 2, for

besides lending no strength to the hull necessitates the employment of an additional shaft with its gears.

By arranging the cutters in groups, as shown and described, a straight cut forward can be made of the width of the boat, while if the boat be swung from side to side, with the groups at the same or different elevations, a progressive cut can be made, this latter being a feature of considerable importance in hard soils. Raising or lowering the cutters changes the angle of the cutters, and as the gangs or groups are independent of each other considerable variation is attainable.

In speaking of cutters I mean to include the mechanical cutter or its equivalent, the hollow yoke or frame to receive and discharge water or steam; in fact, any equivalent device performing the function of the cutter.

Having thus described my invention, what I claim is—

1. In a hydraulic dredger, the combination with a boat; of groups of two or more ladders and appurtenances arranged side by side and with the ladders of each group rigidly connected; and means for raising and lowering the groups of ladders.

2. In a hydraulic dredger, the combination with a boat; of two or more groups of ladders and appurtenances arranged side by side, and with the ladders of each group rigidly connected; means whereby the several groups may be raised and lowered simultaneously or independently; and a main discharge pipe for each group, provided with branches for connection with the respective suction pipes carried by the ladders.

3. In a hydraulic dredger, the combination with a boat; of two or more groups of ladders and appurtenances arranged side by side, and with the ladders of each group rigidly connected; means whereby the several groups

may be raised and lowered simultaneously or independently; and a main discharge pipe for each group, provided with branches for connection with the respective suction pipes carried by the ladders, said branches each terminating in a curved elbow to receive the curved end of the suction pipe.

4. In a hydraulic dredger, the combination with a boat provided with a discharge pipe terminating at one end with a curved elbow D,—the said elbow being located within the hull of the boat; of a pivoted suction pipe provided with a curved end to fit the curved elbow, substantially as shown and described.

5. In a hydraulic dredger, the combination with a boat; of a battery of suction pipes extending across the hull; means for raising or lowering said battery as a whole or in divisions of one or more pipes; each division of pipes being connected by a branch pipe with a main discharge pipe leading to a suitable pump.

6. In a hydraulic dredger, the combination with a boat; of a series of ladders provided each with one or more cutters and suction pipes; curved elbows within the hull of the boat to receive the curved ends of the suction pipes; and means for raising and lowering the ladders.

7. In a hydraulic dredger, the combination with a boat; of two or more groups of ladders and appurtenances, arranged side by side, and with the ladders of each group rigidly connected with each other; and means for raising and lowering the respective groups independently or together.

In witness whereof I hereunto set my hand in the presence of two witnesses.

LINDON W. BATES.

Witnesses:

CHAS. H. WHITING.

G. H. GLENDENING.