

(No Model.)

4 Sheets—Sheet 1.

L. W. BATES.
DREDGER.

No. 543,637.

Patented July 30, 1895.

Fig. 1.

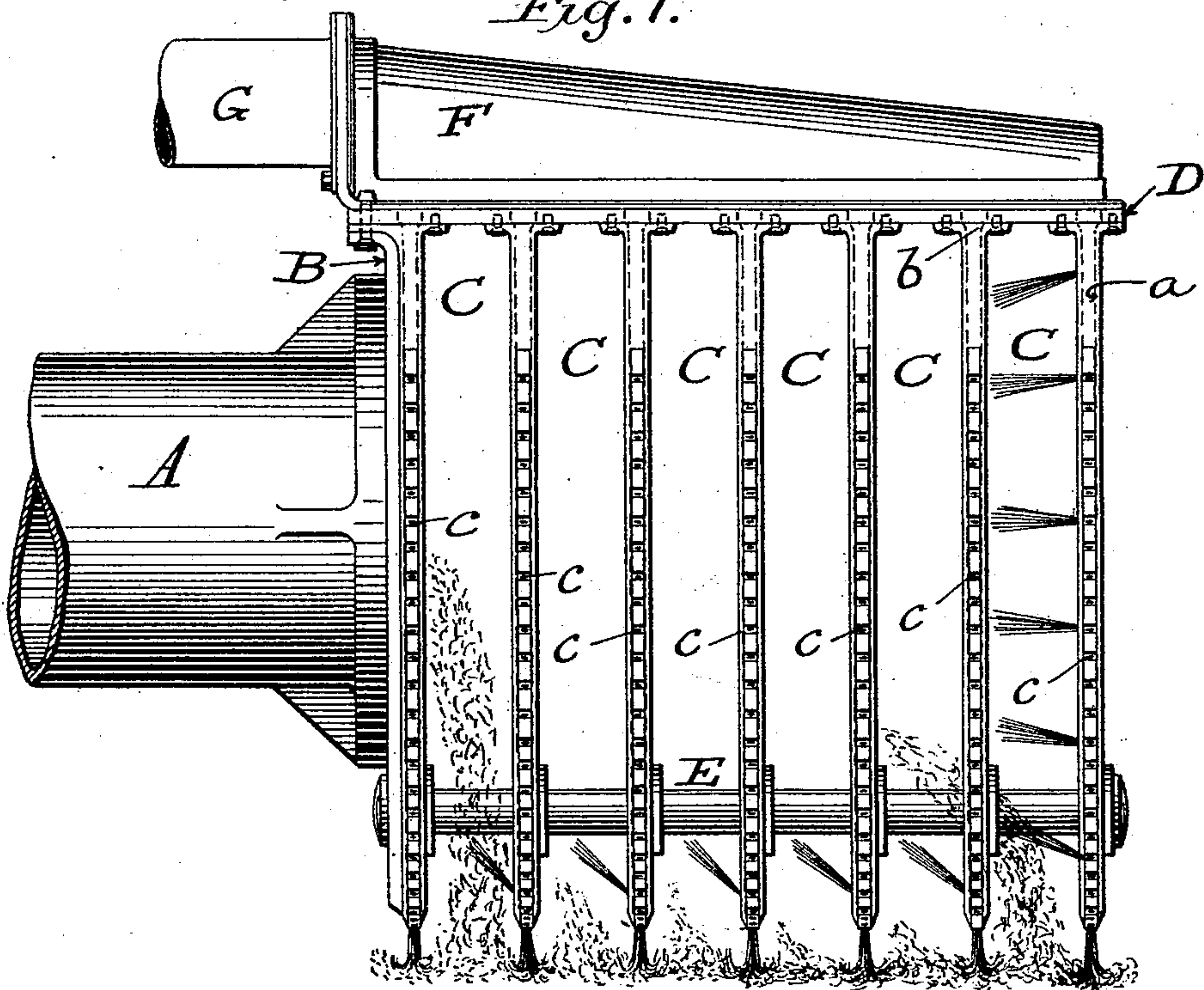
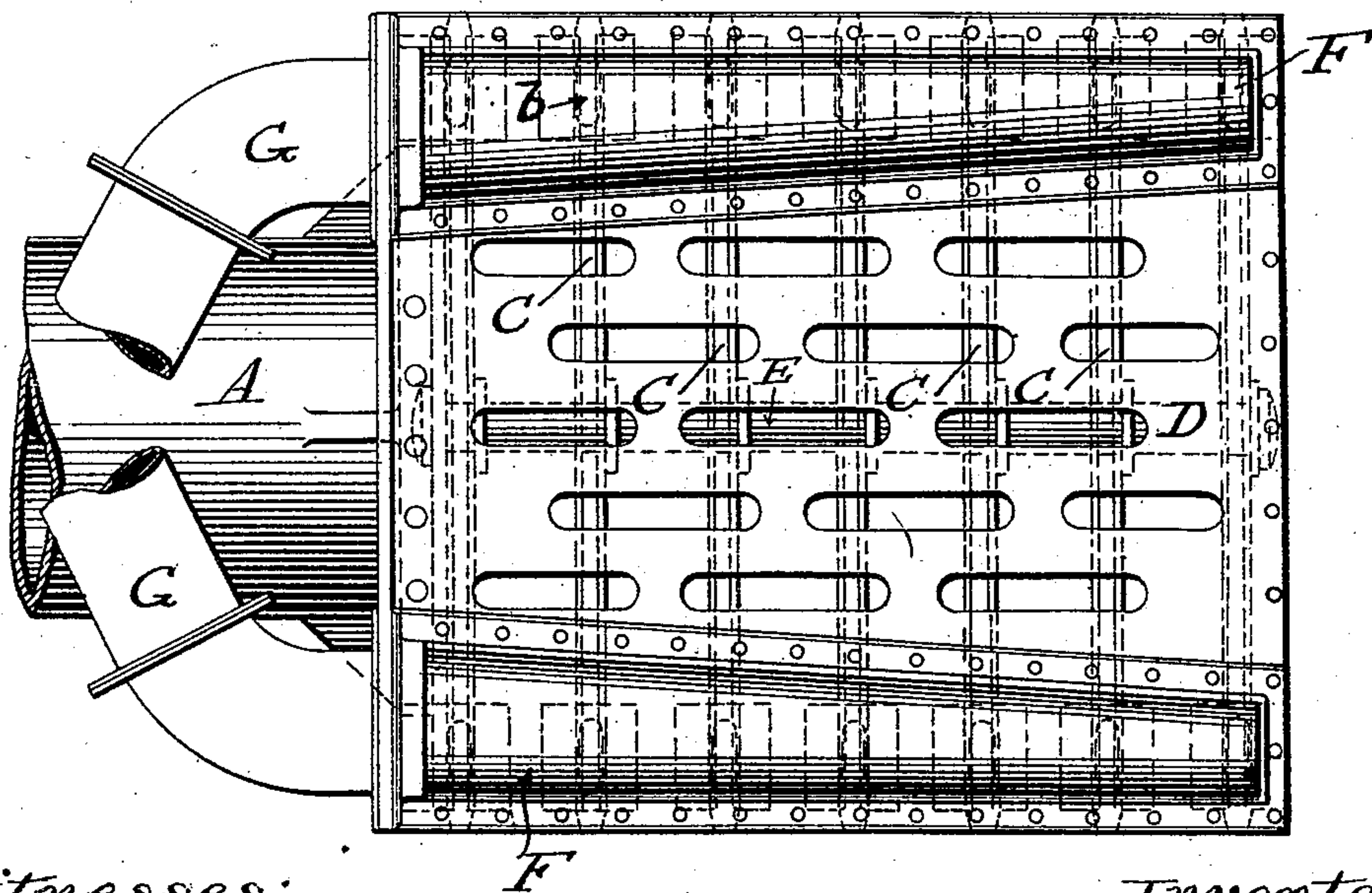


Fig. 2.



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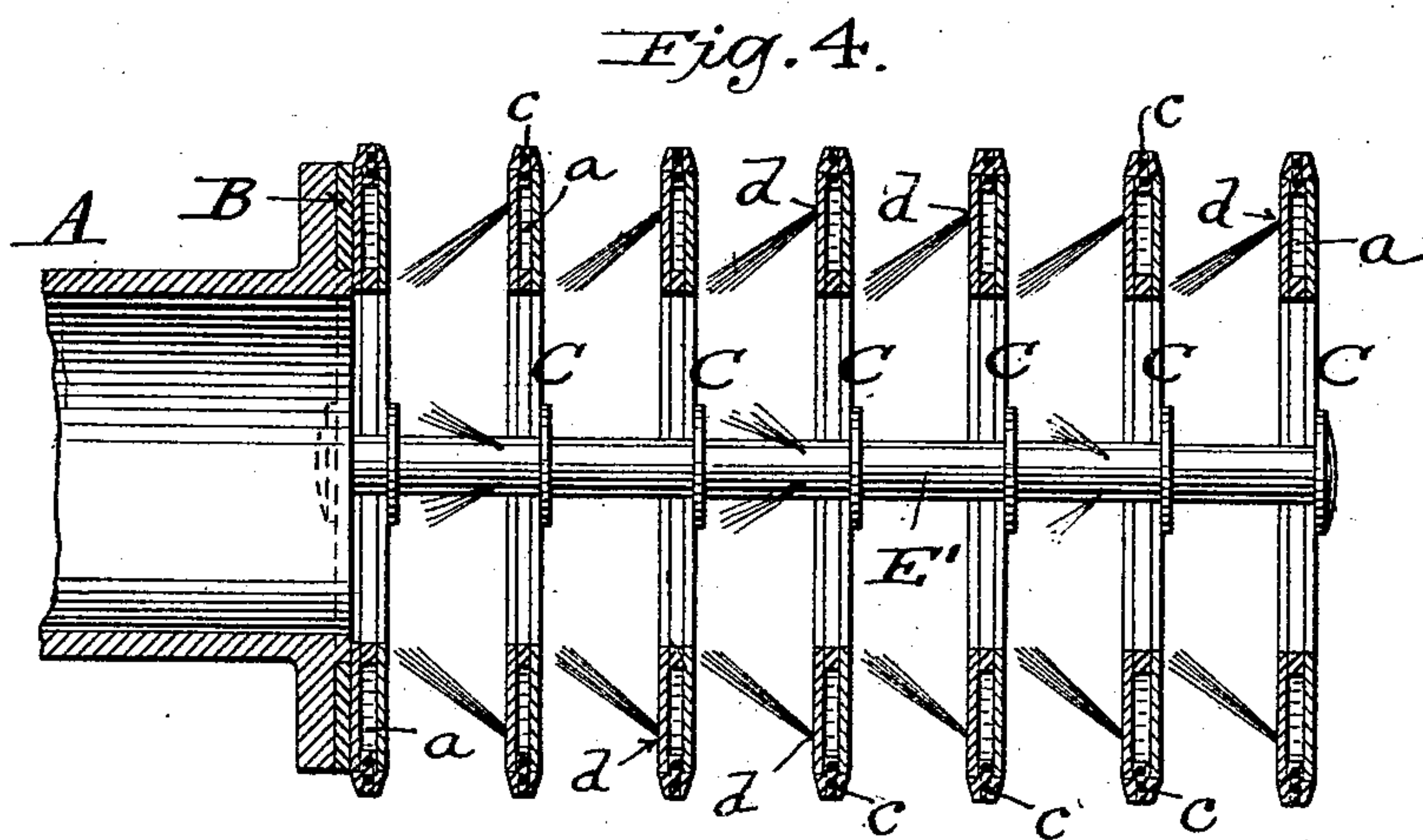
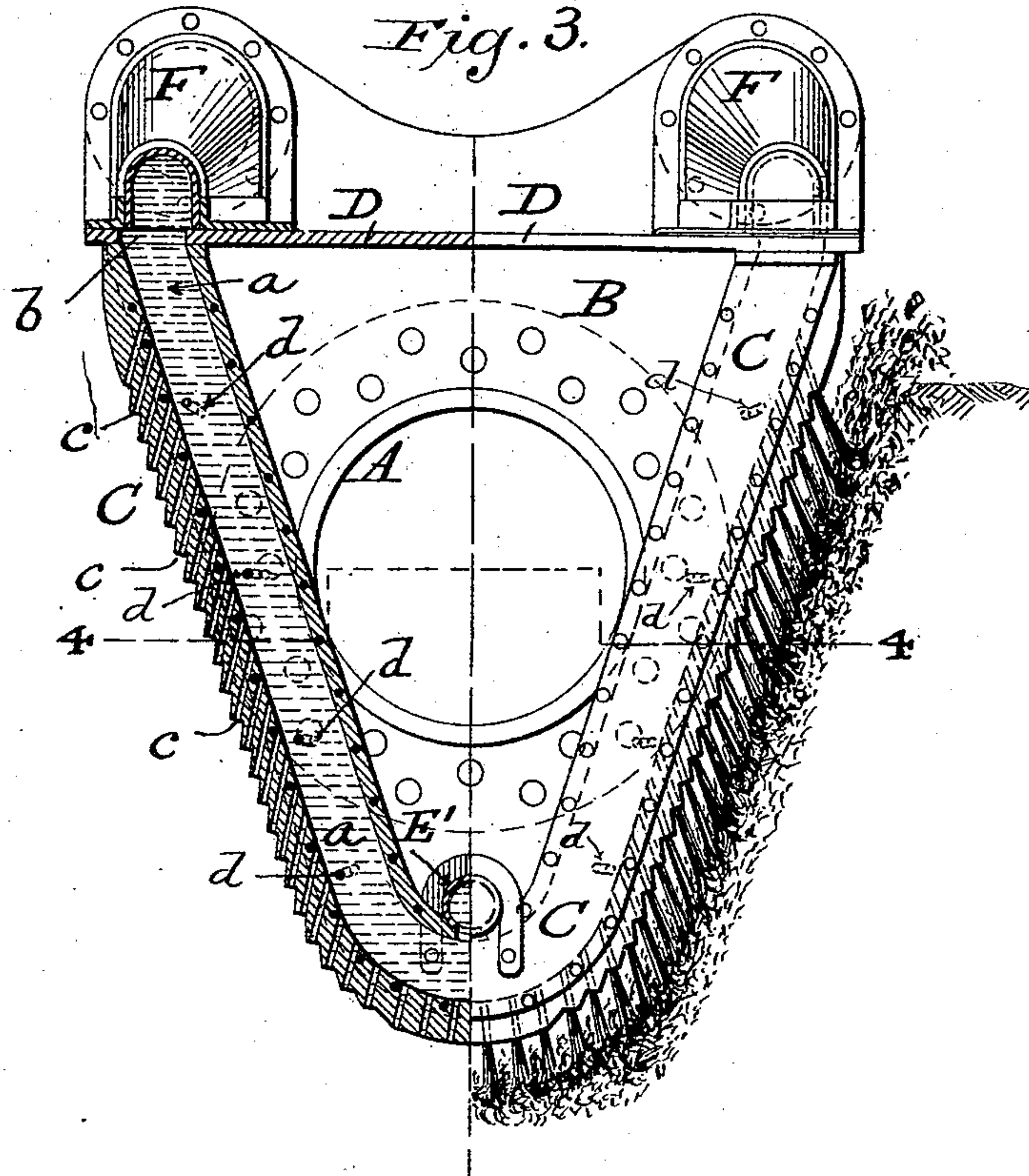
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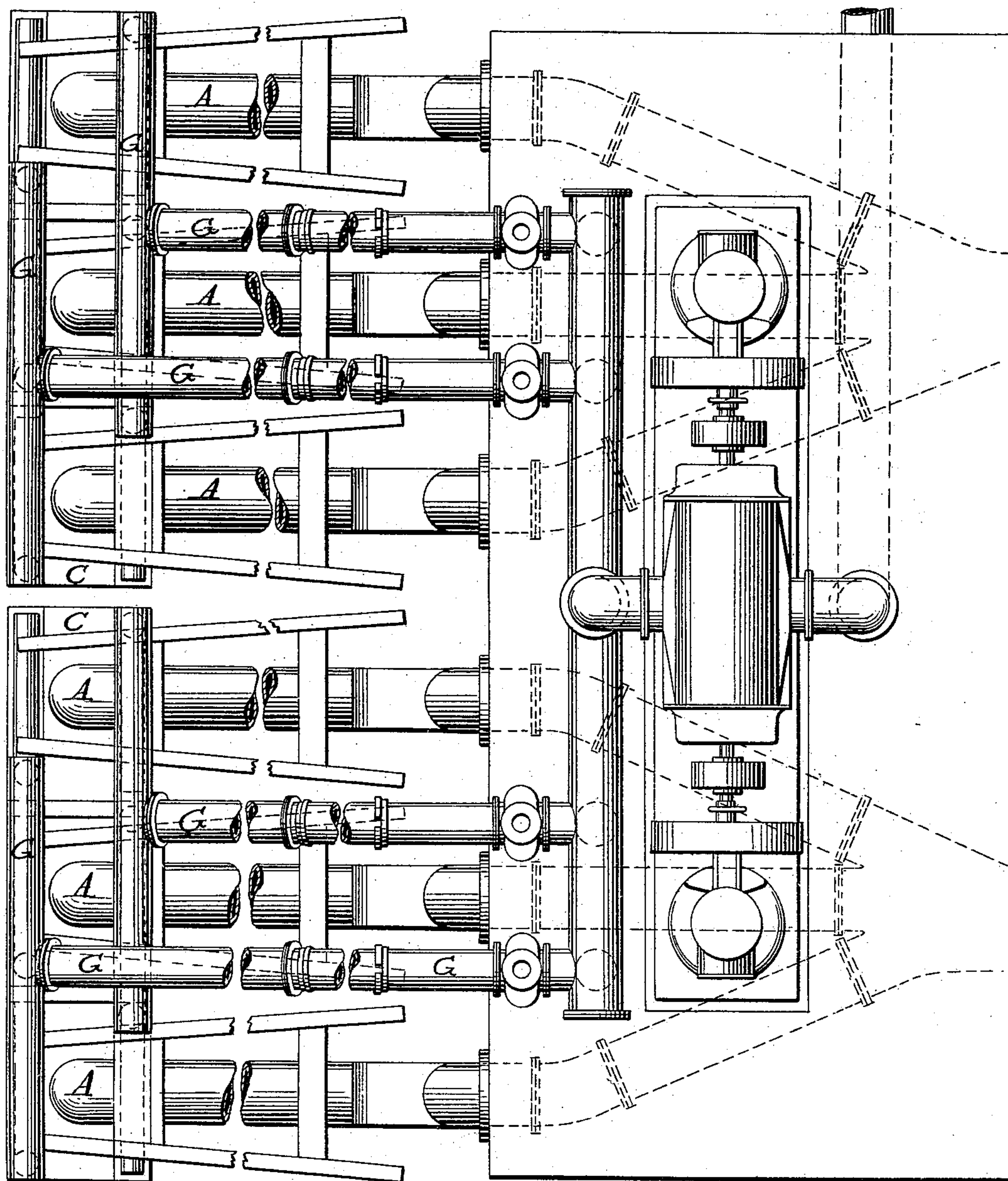
4 Sheets—Sheet 3.

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Fig. 5.



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4 Sheets—Sheet 4.

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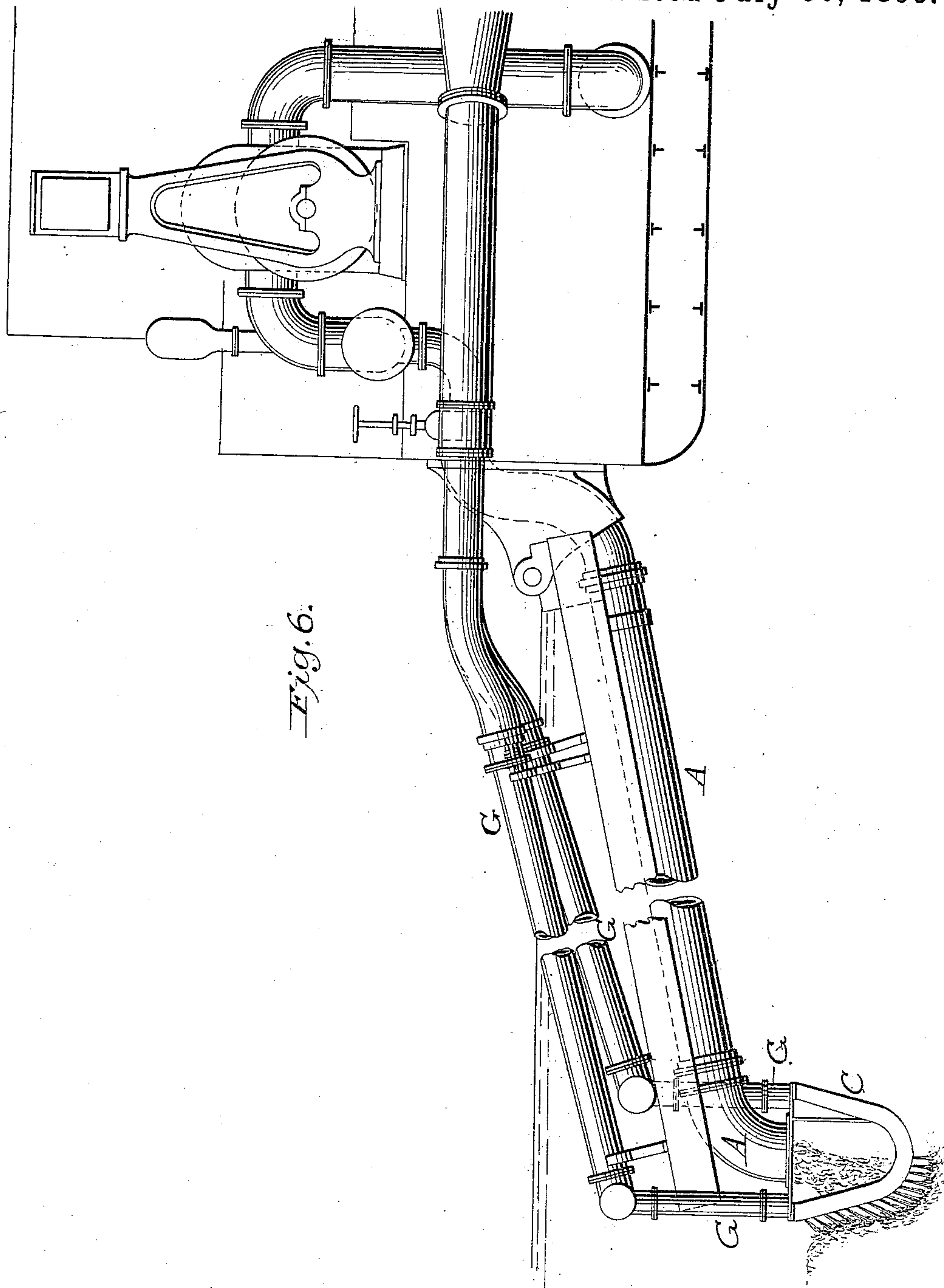


Fig. 6.

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UNITED STATES PATENT OFFICE.

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DREDGER.

SPECIFICATION forming part of Letters Patent No. 543,637, dated July 30, 1895.

Application filed December 26, 1894. Serial No. 532,984. (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 dredging, and has reference more particularly to a novel construction of the rake or frame through which water or steam is discharged under pressure, the said rake or frame being preferably, but not necessarily, carried by the pivoted suction-pipe of the dredge.

In the drawings, Figure 1 is a side elevation of my improved device; Fig. 2, a top plan view; Fig. 3, a front end view with the left side in section; Fig. 4, a horizontal sectional view on the line 4 4 of Fig. 3, and Figs. 5 and 6 views of a modified arrangement.

A indicates the suction-pipe of a hydraulic dredge which has at its end the plate B, which latter is riveted to a collar upon the pipe.

C C indicate the V-shaped yokes, of which there may be more or less, as required. These yokes are hollow—that is to say, they are each provided with a water-way *a*, which is open at its upper ends, as at *b*, Fig. 3, a series of holes or openings *c* on the outer edges communicating with the water-way or channel *a*, and preferably, also, a series of holes or openings *d* on the back face, which also communicate with the water-way *a*, as clearly shown in Fig. 3.

Yokes C C are secured the proper distances apart by being riveted or otherwise secured at their upper ends to an open plate D, Figs. 1, 2, and 3, and at their lower ends to a long bolt E, Figs. 1 and 4, thus making a strong stiff rake or frame.

Upon the top of the plate D are the hoods F F, which, being closed at one end and open on the under side, deliver the water supplied by pipes G G to the several yokes, the plate D being provided at intervals with openings in line with those in the yoke, as shown in Figs. 1, 2, and 3, so as to permit the water to pass from the hoods through the plate into the yokes.

If desired, the bolt connecting the yokes at their lower ends may be made hollow or in the form of a pipe or tube, as at E', Fig. 3,

the said pipe being closed at its ends and connected with the water-way or channel *a* so as to discharge water through suitable orifices, which will be made in said pipe, as indicated in Fig. 4.

In operation, water is forced through pipes G G and hoods F F into the interior of the yokes at a pressure of about one hundred and twenty-five pounds, and the water issuing in jets from the openings *c d* thoroughly cuts up or disintegrates the earth. The rake or frame is designed to be raised and lowered and swung from side to side, and as it enters the sand or alluvial deposit to be dredged the jets issuing downwardly from the edges of the yoke make a passage for the latter. The yokes will divide the soil into strips, which will be cut by the cross-jets issuing from the yokes, these cross-jets issuing rearwardly, serving to direct the material to the suction-pipe. The jets issuing from the hollow tie-bolt E' also assist in directing the loosened material into the suction-pipe. The pipes G G or the hoods F F may be provided with suitable valves, whereby the flow of water may be controlled as required. Instead of mounting this rake upon the end of the suction-pipe it may be used as a drag-rake behind the dredge, and may be used on a dredge having a continuous or intermittent feed.

While I have shown and prefer to employ the V-shaped yokes, it is apparent that they may be made broader at the base and become substantially U-shaped.

I do not limit myself to any special number of yokes, for in some cases one yoke would be sufficient.

Where two or more yokes are employed one of the yokes may be provided on one edge only with peripheral openings and the other yoke with peripheral openings on the opposite edge; or, in case two of the rakes be employed side by side, the yokes of each rake would be provided with openings on one edge only.

The plate D need not necessarily extend beneath the hoods F F, but I prefer to make it as shown.

Instead of arranging the rakes or hollow frames one in advance of the other and in line with the suction-pipe, they may be arranged in gangs at right angles to the suction-pipe, as illustrated in Figs. 5 and 6.

Having thus described my invention, what I claim is—

1. A rake for dredging machines, consisting of a substantially V shaped hollow yoke provided with peripheral openings through which water supplied to the yoke may issue in small jets.
2. A rake for dredging machines, consisting of a substantially V shaped hollow yoke provided on its rear face with openings through which water supplied to the yoke may issue in small jets.
3. A rake for dredging machines, consisting of a substantially V shaped hollow yoke provided on its periphery and on its rear face with openings, through which water supplied to the yoke may issue in small jets.
4. A rake for dredging machines, comprising a series of hollow yokes, separated from each other, connected with a water supply, and provided with openings through which water supplied to the yoke may issue in small jets.
5. In combination with a series of hollow yokes provided with openings through which water may issue in small jets; the connecting plate D provided with openings in line with the yokes; the hoods F F, connected with a

water supply, and adapted to deliver water through the plate into the yokes.

6. In combination with a series of hollow yokes provided with openings through which water may issue in small jets; the perforated tie-bolt or tube E' connecting the lower ends of the yokes and communicating with the water way of the yokes; and means for supplying water to the water-way.

7. In combination with the suction pipe, a rake or frame carried thereby and consisting of a series of hollow yokes connected with a water supply and provided with openings through which water may issue in small jets.

8. In combination with the suction pipe; a rake or frame carried thereby and consisting of a series of hollow yokes connected with a water supply, and having openings on the periphery and rear face; whereby the material is cut up and forced toward the suction pipe by the small jets issuing from the openings.

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

LINDON W. BATES.

Witnesses:

G. H. GLENDENINGS,
CHAS. H. WHITING.