(No Model.) 3 Sheets—Sheet 1.

W. A. FLETCHER.

DREDGING MACHINE.

No. 418,000. Patented Dec. 24, 1889.

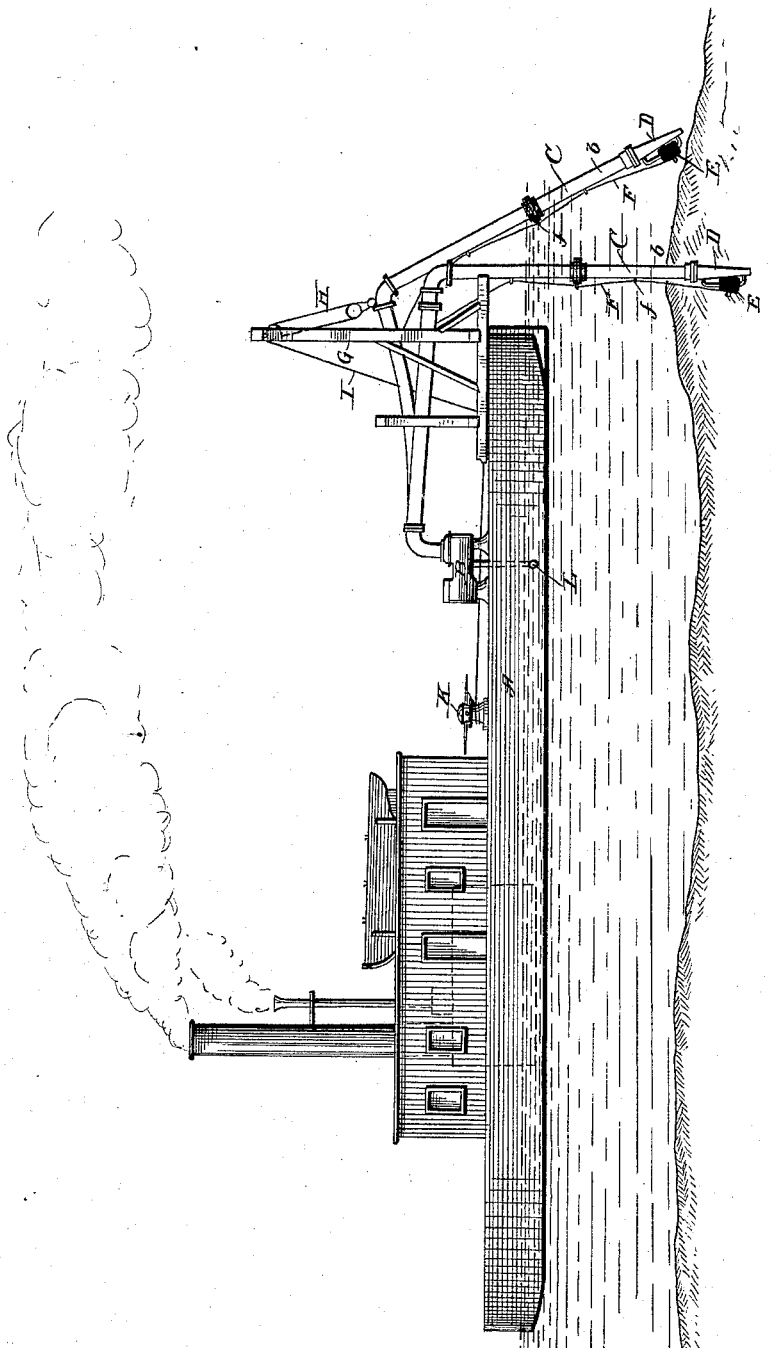

Fig. 1.

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Louis Bagger & Co.

(No Model.)

3 Sheets—Sheet 2.

W. A. FLETCHER.

DREDGING MACHINE.

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Fig. 2.

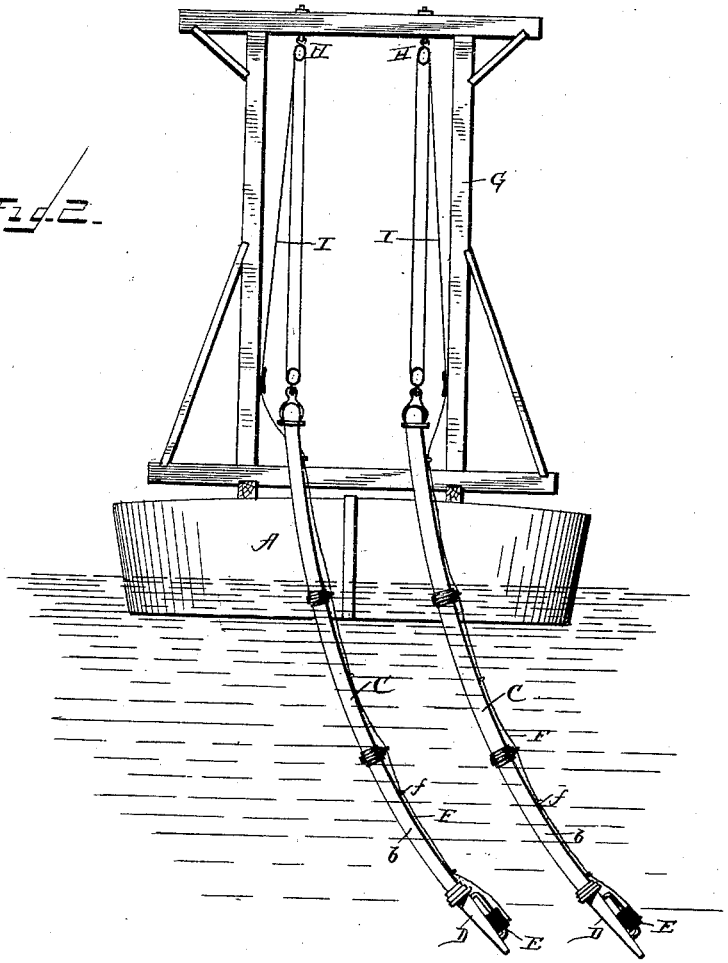
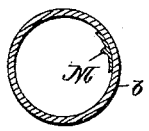


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

W. A. FLETCHER.

DREDGING MACHINE.

No. 418,000. Patented Dec. 24, 1889.

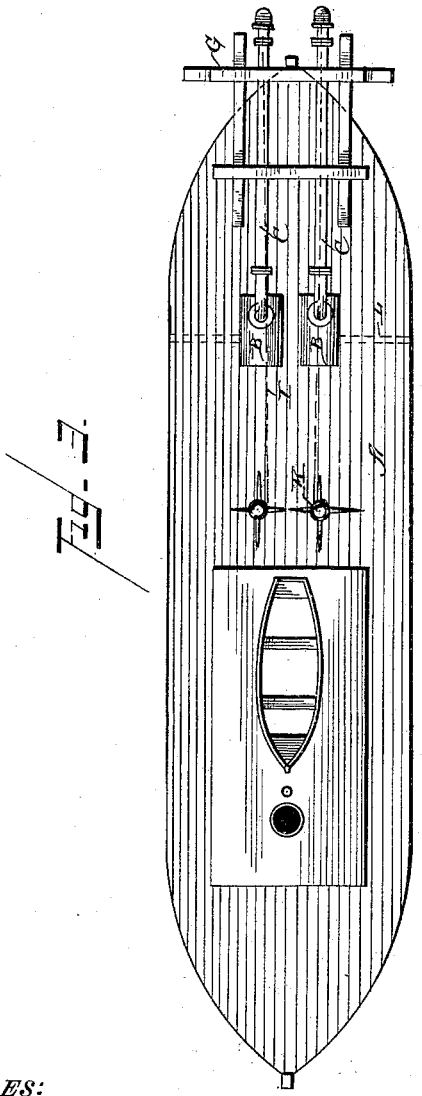

Fig. 4.

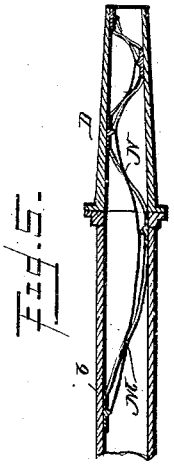

Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM A. FLETCHER, OF BEAUMONT, TEXAS.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 418,000, dated December 24, 1889.

Application filed August 30, 1889. Serial No. 322,394. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. FLETCHER, a citizen of the United States, and a resident of Beaumont, in the county of Jefferson and State of Texas, have invented certain new and useful Improvements in Dredging-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to dredging-machines, and has for its object to construct a dredger which shall in an improved manner co-operate with and utilize the current in removing accumulations from the bed of channels. I accomplish this object by the improved construction and adaptation of parts of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a boat embodying my invention. Fig. 2 is an end view of the same, showing the gallows or frame and pulleys by which the hose shown in Fig. 1 is adjusted and managed, and showing the boat in the operation of being swung around. Fig. 3 is a top or plan view of the boat and attachments. Fig. 4 represents a cross-section of the lower portion of the hose, showing a modification in the construction; and Fig. 5 is a longitudinal sectional view of the nozzle and lower portion of the hose, further illustrating the modification shown in Fig. 4.

Like letters of reference denote corresponding parts in all the figures.

I am aware that it is not a new idea to attempt to utilize the current of a stream to remove accumulations of silt from the bed of channels. While my invention resembles in outward appearance several previous devices of this class, its improved construction and novel adaptation of parts render it essentially different, while it is at the same time more simple and efficient.

I employ a boat, which may be either a propeller having suitable machinery by which its movements are controlled, or may be a barge adapted to be managed by a tug. As represented in the accompanying drawings, it is designed to be managed by a tug, and is designated by the letter A. The barge is fitted with suitable boilers and engine and a pair of powerful force-pumps B, of large capacity. It is essential in regard to these parts that the boilers and engine be of sufficient capacity and power to work the pumps with the desired force. To each pump is attached a large strong hose C, preferably spirally laid, and which can be made of any desired length by attaching additional sections. This hose is of sufficient length to extend over the end of the barge and reach the bottom of the channel or the deposit it is desired to remove. The lower end of each hose is furnished with a heavy nozzle D, and there is suitable provision for attaching additional weights E to the hose and nozzles, as shown in Fig. 2. When the water is driven through the hose under heavy pressure, the reaction will be considerable, and the mass of the nozzle and weights must be sufficient to counteract this reaction. In order that the amount of weight resting upon the nozzle may be varied at will, a cord F is attached to the weight and runs through a series of rings or eyes *f*, attached to the hose, to the barge. Thus the amount of additional weight on the nozzle may be varied as circumstances require, and without varying the vertical adjustment of the hose and nozzles.

The end of the barge is fitted with a gallows G, having suitable pulleys and tackle H for raising, lowering, or otherwise adjusting the hose. The hoisting-ropes I are connected to the hose, pass from thence around guides over the pulleys or tackle, and from thence to the capstans K, the capstans and connections of the ropes with the capstans not being shown in Fig. 2. The capstans may be operated either by hand or steam power, according to the size and weight of the apparatus.

The pumps are provided with suitable feed-pipes L, which extend through the side of the vessel and take their water from the stream.

It will usually be found advisable to employ the modification in the construction of the hose and nozzles shown in Figs. 4 and 5. The lower section *b* of the hose is provided on the interior with a preferably metallic band M, which is T-shaped in cross-section and is spirally wound therein. The twisting of the band M is at first slight, but increases toward the lower end, and the nozzle is also provided

with an interior spiral flange N, which forms a continuation of the band M, and the twisting of which increases to the point of the nozzle. Thus the spout of water on leaving the nozzle has a whirling motion similar to that of a shot from a rifled cannon, and produced in a similar way. It will be seen that the stirring power of the spout of water, and consequently the efficiency of the machine, will be greatly increased by this device.

As the barge is moved along over the deposit to be removed or channel to be deepened the pumps are kept in operation and a large spout of water driven with great force through the hose and against the deposit to be removed. This scours the silt from the bottom and it is taken up and carried off by the current.

The flexibility of the discharge-hose will be found to greatly facilitate the operation of the machine and to adapt it to be used successfully under nearly every conceivable condition or variation of a channel. If the barge be moved straight ahead, the nozzles will follow along, adjusting themselves to any unevenness in the bed of the channel. If it be turned to either side, the nozzles swing around with perfect freedom, as shown in Fig. 2; or if the barge move backward the dredge will work equally well, and in any case there is nothing about the subaqueous portion of the machine to catch, become entangled, or broken.

It is evident that the dredge may consist of one or more pumps and hose. It has been shown here with two, as that number will be found preferable for ordinary use.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The herein-described hose, having its lower portion provided with an interior band substantially T-shaped in cross-section and spirally arranged, the twist increasing downwardly, substantially as shown, said hose being adapted to be attached to a force-pump and carry a spout of water against subaqueous deposits of silt, substantially in the manner described.

2. The combination, in a dredger, of force-pumps, flexible hose attached to said pumps and having an interior spirally-arranged T-shaped band and an interiorly spirally-flanged nozzle, and means, substantially as described, for operating said pumps and supplying them with water.

3. The combination, in a dredger, of force-pumps, flexible hose attached to said pumps, the lower portion of said hose having an interior band constructed and arranged substantially as described, a series of external rings fixed to said hose, a nozzle having an interior spirally-arranged and increasingly-twisted flange, a removable weight attached to said nozzle, a cord attached to said weight and adapted to regulate the proportion of the mass of said weight acting on said nozzle, and means for operating said pumps and providing them with water, all constructed and arranged substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM A. FLETCHER.

Witnesses:
CHAS. MARTIN,
S. F. CARTER.