

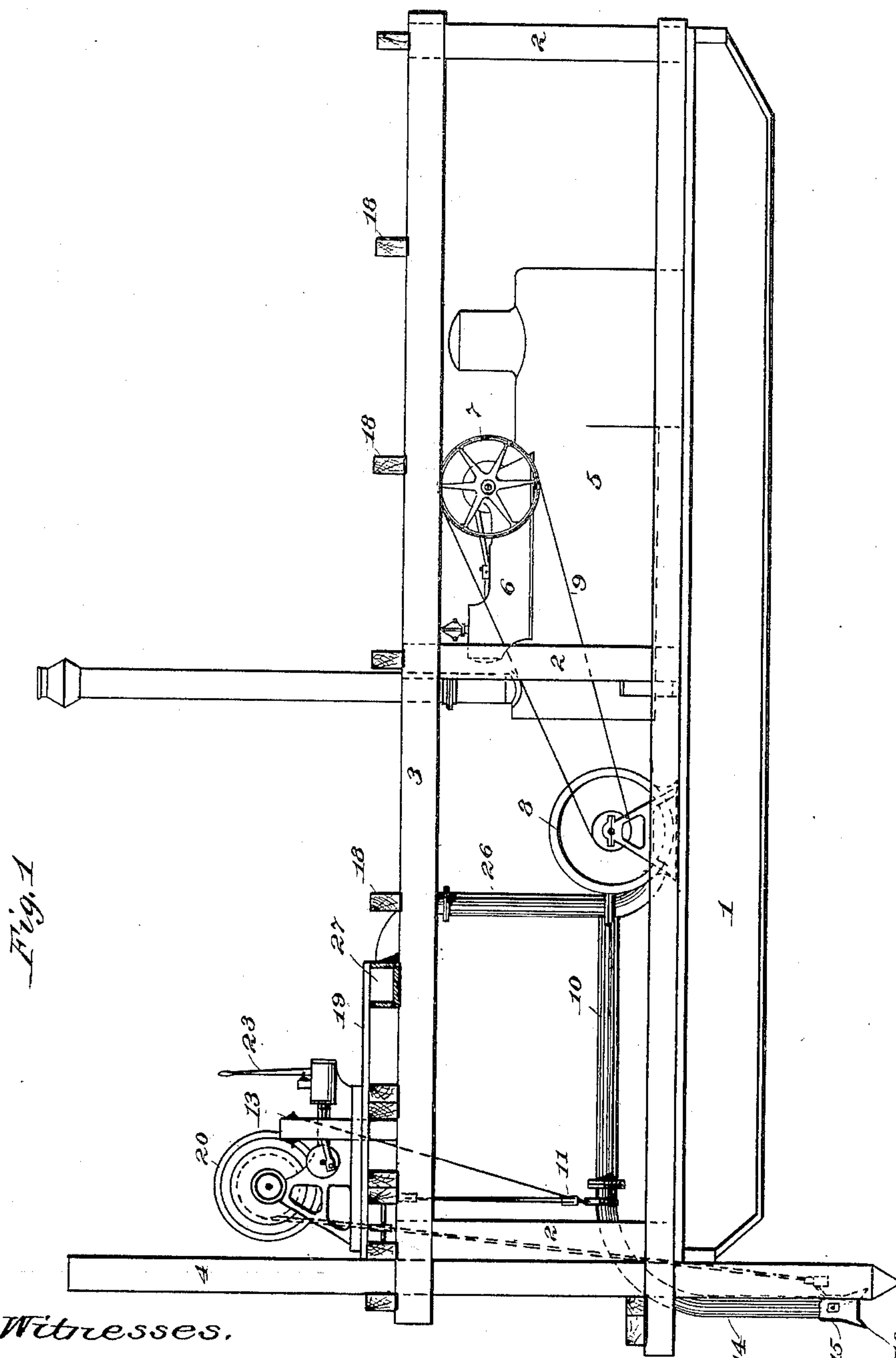
(No Model.)

3 Sheets—Sheet 1.

A. McDOUGALL.  
DREDGING APPARATUS.

No. 604,628.

Patented May 24, 1898.



Witnesses.

*D. A. Hanna*  
*Archie G. Reese*

Inventor.

*Alexander McDougall*  
*by Frank L. Dyer Atty.*

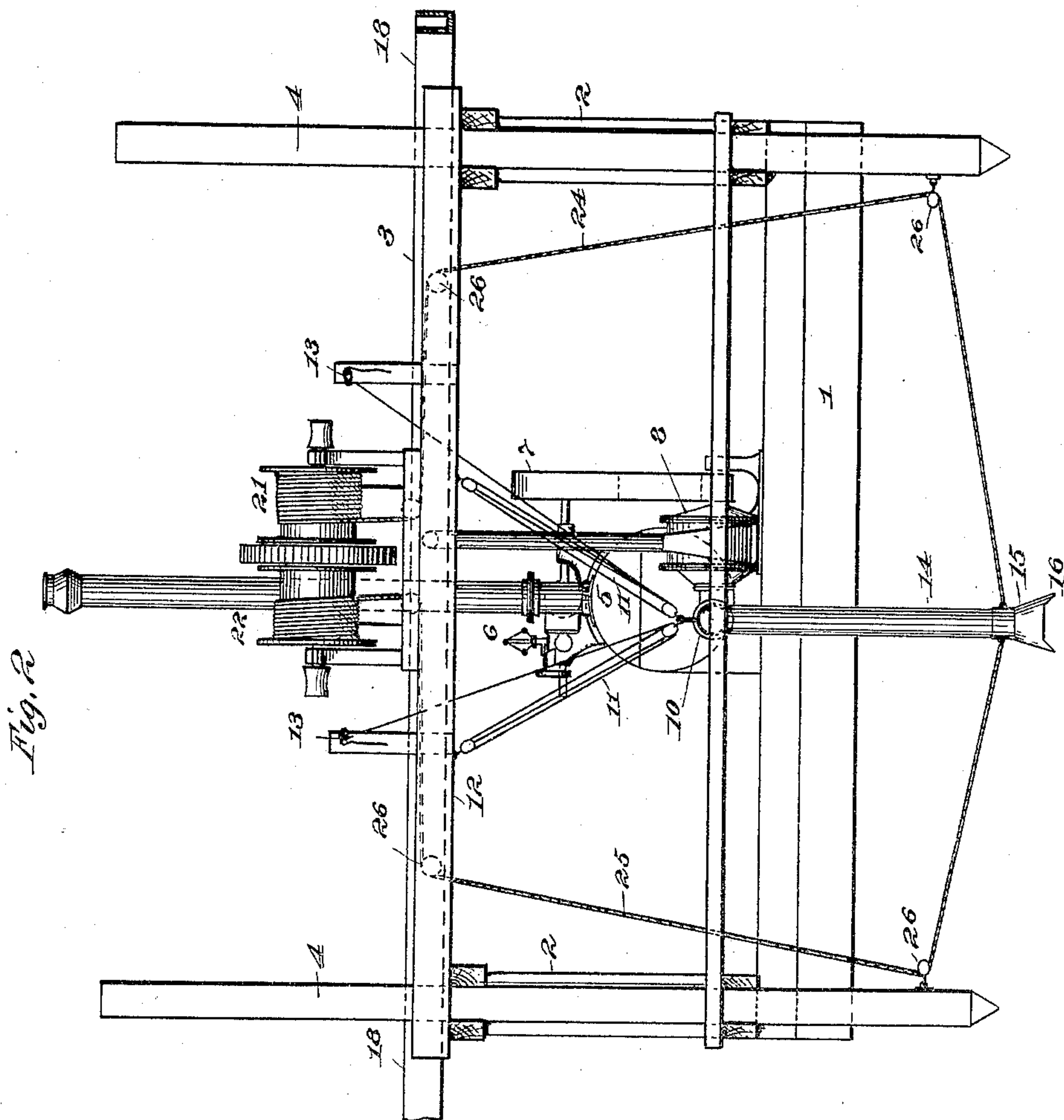
(No Model)

3 Sheets—Sheet 2.

A. McDOUGALL.  
DREDGING APPARATUS.

No. 604,628.

Patented May 24, 1898.



Witnesses.

*D. A. Smith*  
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Inventor.

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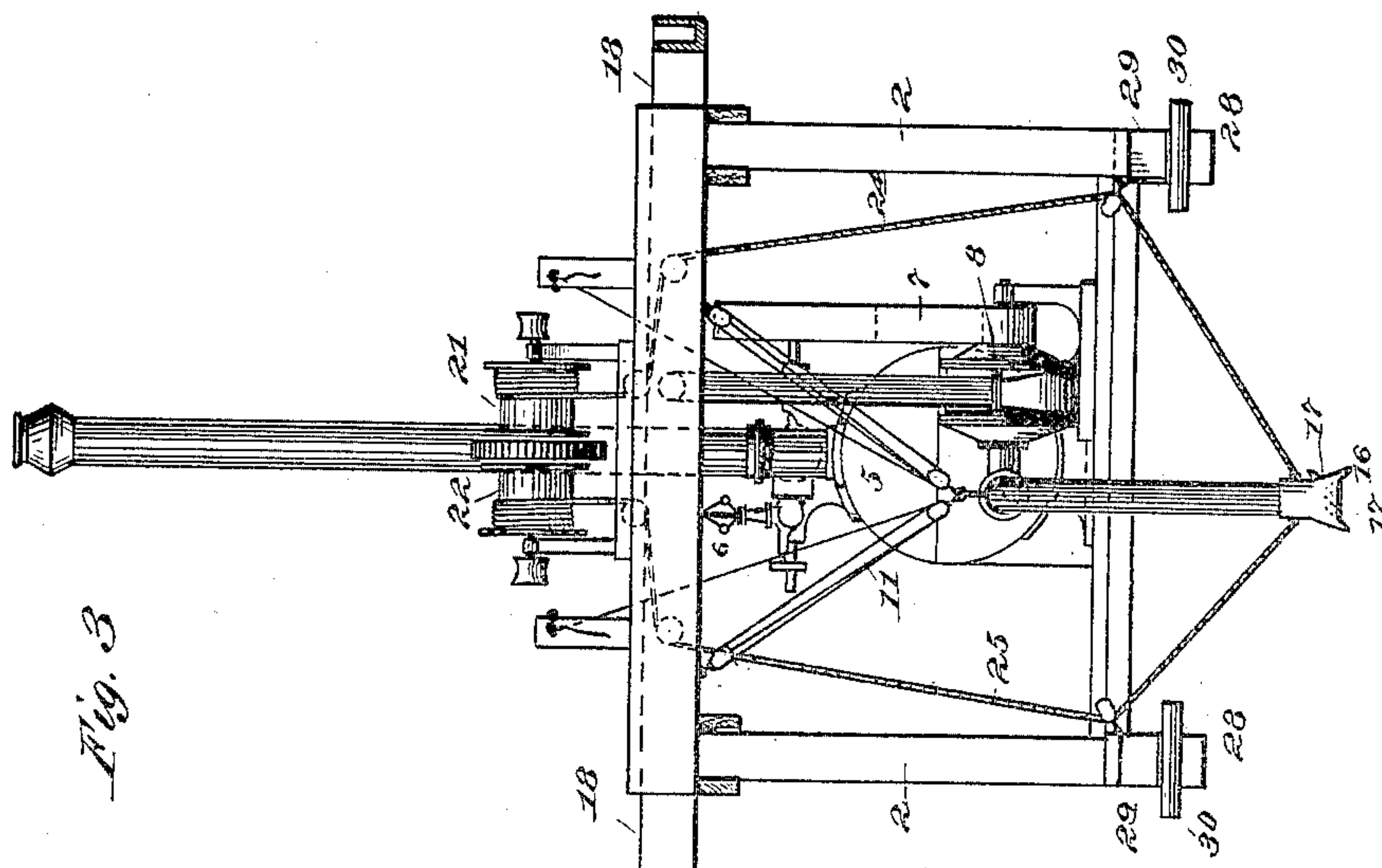
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3 Sheets—Sheet 3.

A. McDOUGALL.  
DREDGING APPARATUS.

No. 604,628.

Patented May 24, 1898.



Witnesses.

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# UNITED STATES PATENT OFFICE.

ALEXANDER McDOUGALL, OF DULUTH, MINNESOTA.

## DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 604,628, dated May 24, 1898.

Application filed March 5, 1897. Serial No. 626,112. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER McDOUGALL, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Dredging Apparatus; and I do hereby declare the following to be 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.

My invention relates to various new and useful improvements in apparatus for removing sand and gravel in connection with water and for separating the sand or gravel thus removed from the water.

The invention is particularly adapted for the dredging of rivers and harbors and for the removal of mineral-bearing sand or gravel from the bottoms of lakes and rivers, as I have described in my Patents No. 531,740, dated January 1, 1895, and No. 547,496, dated October 8, 1895.

For a better comprehension of my present invention attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side view of the invention, partly in section; Fig. 2, a front view of the same, and Fig. 3 a front view showing the dredging apparatus mounted in skids.

In all of the above views corresponding parts are represented by the same numerals of reference.

Preferably the apparatus is carried upon a scow 1, of the ordinary construction, or on a boat; but in some instances and with certain varieties of work it may be mounted upon suitable skids, as in Fig. 3, or other structure over the locality from which the sand or gravel is to be removed. The scow 1 is provided at its corners and at suitable intermediate points with stanchions 2 2, which stanchions carry an upper frame or superstructure 3, of a generally rectangular shape.

4 4 are spuds at the two front corners of the scow and by which the scow may be held at any desired position. If desired, other spuds may be employed at the rear end of the scow, as I have described in my said specification.

5 is a boiler which is shown as being of the

ordinary horizontal type, and 6 is an engine carried upon said boiler and which receives steam therefrom. This engine operates a fly-wheel 7.

8 is a powerful centrifugal or other pump mounted upon the scow in front of the boiler 5 and which is operated from the fly-wheel 7 by a belt 9.

The suction-pipe 10 of the pump 8 connects with the same and when the apparatus is not used extends approximately parallel with the deck of the scow. This suction-pipe 10 may be a metal pipe connected to the pump 8 by a flexible connection, so that the suction-pipe will be free to move with respect to the pump, or the suction-pipe itself may be made of rubber or other flexible material, or it may be a metal pipe provided with flexible joints, as will be understood.

The suction-pipe 10 is supported at its forward end in any suitable way—such as, for instance, by means of tackles 11 11, connected to a cross-frame 12, Fig. 2. The ends of the tackles 11 extend to suitable cleats 13, by which they may be secured. By means of the tackles 11 11 the suction-pipe 10 of the pump 8 may be moved upward when the apparatus is out of use or be swung to one side or the other, as may be required in use. It will be of course understood that a single tackle may be employed for supporting the suction-pipe and that the suction-pipe may be supported in other ways.

At the end of the suction-pipe 10 is a heavy dredge-pipe 14, which is curved, as shown, and which is preferably made of steel tubing. This dredge-pipe is of sufficient length to engage with the bottom of the river or lake when in operation.

At the lower end of the dredge-pipe 14 is a heavy casting or an extra piece of pipe 15, bolted or riveted to the same and provided with teeth 16 at the lower end for engaging with the bottom and loosening the same. This casting may be perforated at its sides, as I have described in my Patent No. 547,496, or it may be imperforate and be provided with bars 17, Fig. 3, at its lower end, arranged closely together, and which will prevent the entrance into the dredge-pipe of any obstruction sufficiently large to damage or clog the pump 8.



When the apparatus is used with soft materials, the heavy casting 15 may be dispensed with, and the lower end of the dredge-pipe may in that case be engaged with the bottom.

5 When the casting 15 is not employed, the lower end of the dredge-pipe may be provided with a screen for excluding materials which might damage the pump.

Mounted upon the superstructure 3 are  
10 cross-beams 18, which may extend some distance out beyond the sides of the scow for carrying a suitable separating or concentrating apparatus. Carried upon these cross-beams 18, near the forward end of the apparatus, is a platform 19, on which the operator of the apparatus stands. This platform  
15 19 carries a steam-windlass 20, of any suitable construction, preferably having a double drum 21 22. A lever 23 controls the action  
20 of this windlass, either to stop the same or to drive it in different directions. The windlass 20 may be located elsewhere, if desired.

Connected to the double drum 21 22 of the windlass 20 are two cables 24 and 25, extending  
25 around said drum in opposite directions, which cables pass around suitable blocks or sheaves 26 and connect at opposite sides to the casting 15 or pipe 14. By this means  
30 when the windlass is operated in one direction one of the cables 24 or 25 will be wound up on the drum 21 or 22 and the other cable will be wound off the other drum, so that the dredge-pipe 14 will be swung in one direction  
35 with the casting 15 or lower end of suction-pipe in contact with the bottom of the river or lake, and when said windlass is operated in the other direction the reverse movements will take place, so as to move the dredge-pipe  
40 14 in the opposite direction.

The discharge-pipe 26 of the pump 8 leads to any desired locality. When the apparatus is used for the purpose of dredging rivers or harbors, this pipe may be laid on pontoons or floats to convey to the shore the mixture  
45 of sand and water, the water draining off, as in the ordinary process.

When the apparatus is used for the recovery of gold or other mineral bearing sand or gravel, this discharge-pipe may be conducted  
50 to any concentrating or separating apparatus located on the scow or elsewhere. In the present case I show the discharge-pipe 26 connected with a trough 27, mounted on the superstructure 3, which trough extends at right  
55 angles to the scow, with its ends extending beyond the sides of the scow, and by which the mixture may be directed upon or into any desired form of concentrating or separating apparatus.

60 The operation of my improved device is as follows: The scow is moved to the desired position for operation and the spuds 4 are forced downward, so as to engage with the bottom and anchor the scow firmly in place.

65 The tackles 11 11 are now slackened up, so as to allow the dredge-pipe 14 to come into contact with the bottom and engage therewith

to the desired depth. The pump 8 is now operated and draws by suction through the dredge-pipe 14 large quantities of sand or  
70 gravel and water, which mixture is forced through the discharge-pipe to the desired locality. At the same time the operator on the platform 19 directs the operation of the windlass 20, causing the same to operate first in  
75 one direction and then in the other, so as to swing the dredge-pipe 14 into contact with the bottom, so as to cover an area equal to the width of movement thereof.

With the apparatus shown, which is used  
80 particularly for the recovery of gold-bearing sand, the discharge from the pump 8 is directed into the chute 27, which conveys it to the concentrator, which may be any known  
85 device for separating the gold from the sand or gravel and which may be located on the scow or on shore.

In Fig. 3 I illustrate my improved dredging apparatus mounted on skids 28 28, of ordinary construction, and which may be laid  
90 directly on the ground at that locality where the dredging is to take place or on the banks of a narrow creek from whence the sand or gravel is to be removed, or, if desired, the said skids may be mounted on the bottom of  
95 the lake or river when there is a small depth of water and the bottom is sufficiently firm. When the apparatus is carried on skids, the foundation or bed may comprise two heavy  
100 main beams 29 29, secured together by cross-ties, and from which the stanchions 2 extend upward.

For convenience in moving the device I may interpose rollers 30 between the main beams 29 and the skids 28, or the dredging  
105 apparatus for the same purpose may be carried on supporting-wheels, in which case the skids will serve as tracks for said wheels.

Having now described my invention, what I claim as new therein, and desire to secure  
110 by Letters Patent, is as follows:

1. In a dredging apparatus, the combination of a support, a pump mounted thereon, a suction-pipe flexibly connected to said  
115 pump, means for sustaining the forward end of said suction-pipe, a dredge-pipe connected to said suction-pipe and in contact with the material to be removed, a superstructure for said support, a steam-windlass, connections  
120 between said windlass and said dredge-pipe for moving the latter back and forth in contact with the material, and a trough or chute secured to said superstructure and connected to the discharge-pipe of the pump, substantially as set forth.  
125

2. In a dredging apparatus, the combination of a support, a pump mounted thereon, a suction-pipe flexibly connected to said  
130 pump, means for sustaining the forward end of said suction-pipe, a dredge-pipe connected to said suction-pipe and in contact with the material to be removed, a superstructure for said support, a steam-windlass having a double drum carried on said superstructure and



mounted directly over the forward end of said suction-pipe, and two cables wound in opposite directions on said double drum and connected to opposite sides of the dredge-pipe  
5 for moving said dredge-pipe back and forth in contact with the material, substantially as set forth.

This specification signed and witnessed this 2d day of February, 1897.

ALEXANDER McDOUGALL.

Witnesses:

CHAS. W. BELAND,  
L. DELLA MCGIRR.