

(No Model.)

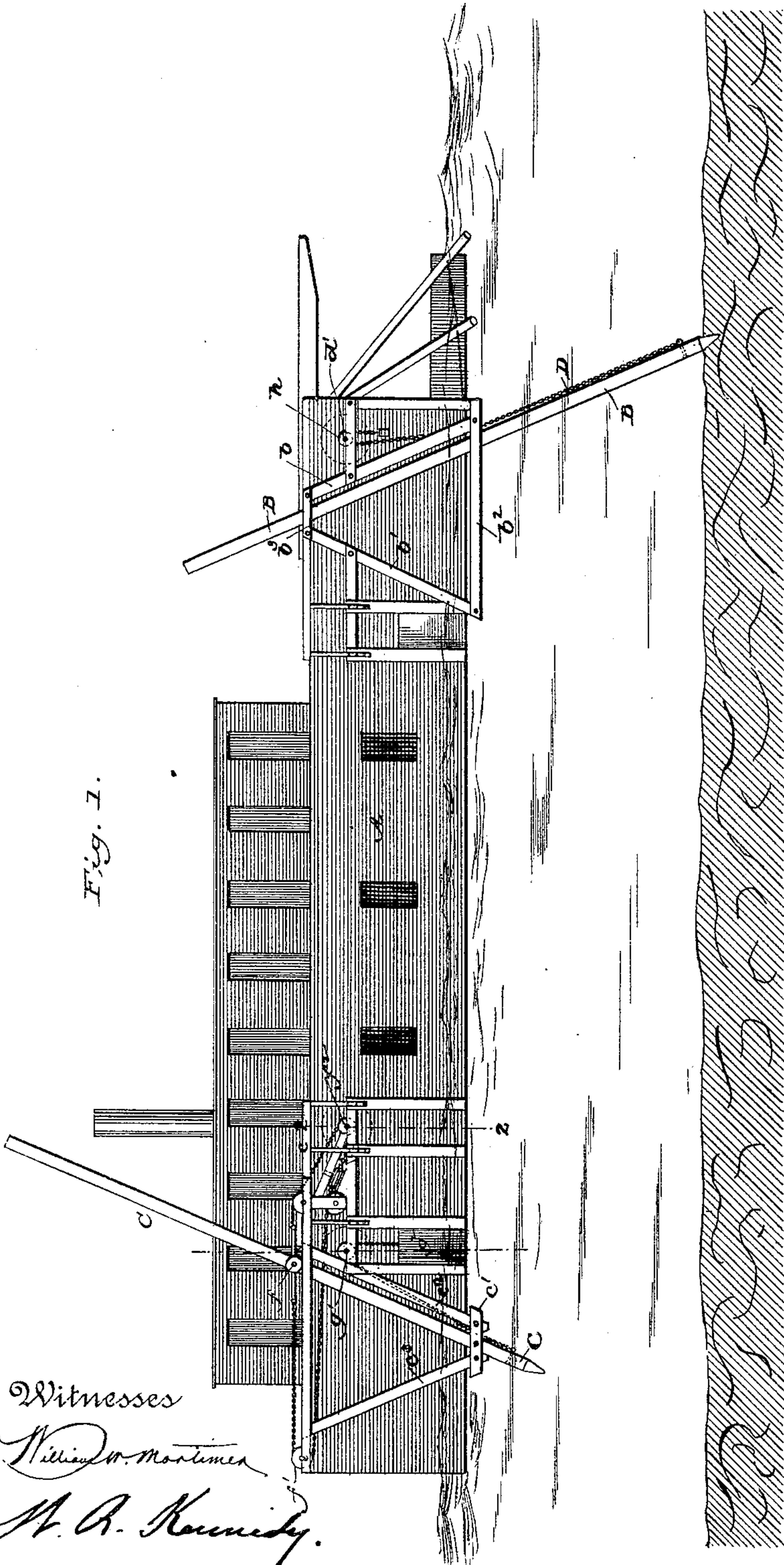
4 Sheets—Sheet 1.

T. Z. COLE.
DREDGING MACHINE.

No. 415,501.

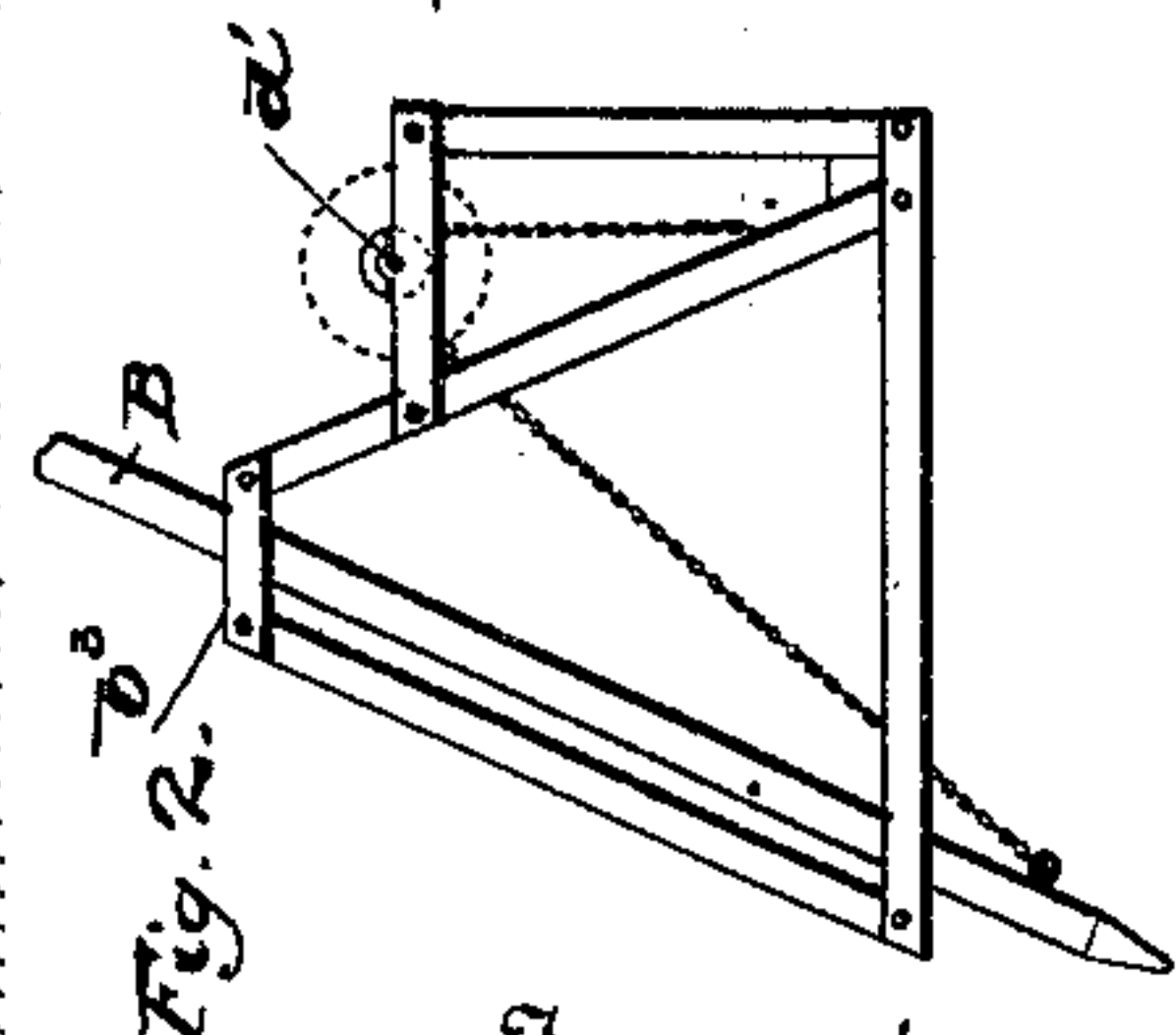
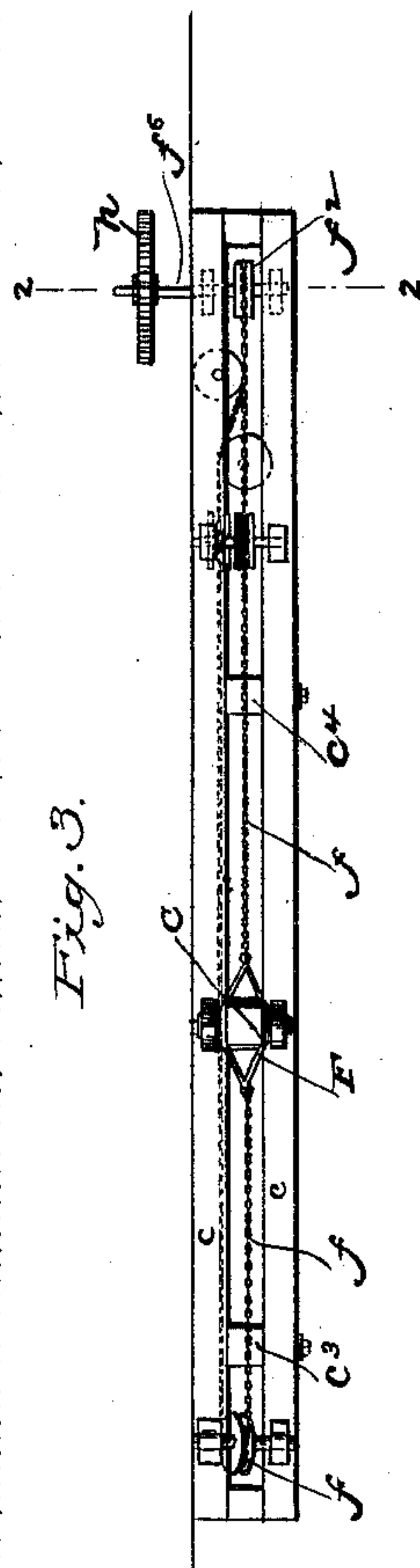
Patented Nov. 19, 1889.

Fig. 1.



Witnesses
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Fig. 3.



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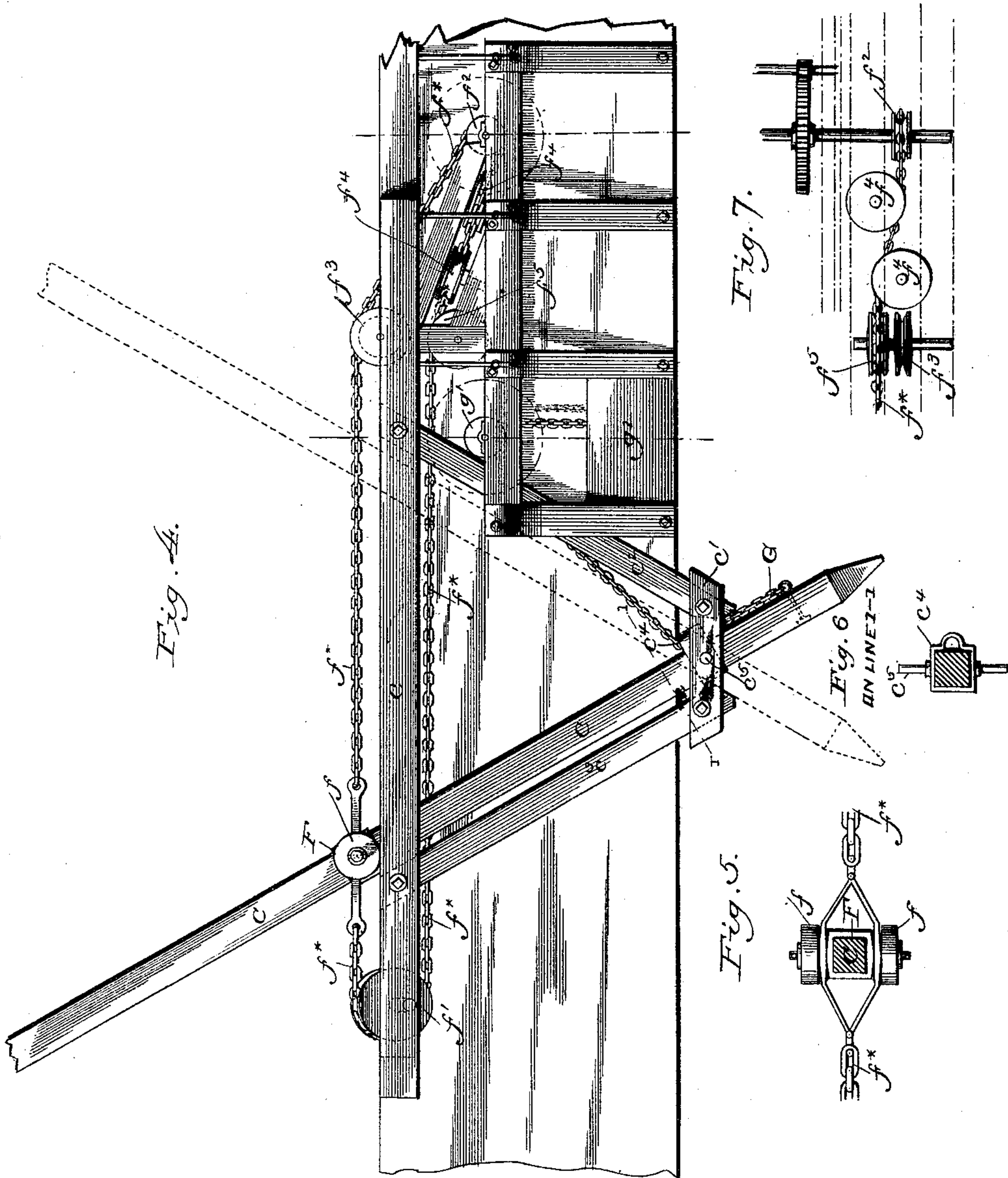
(No Model.)

4 Sheets—Sheet 2.

T. Z. COLE.
DREDGING MACHINE.

No. 415,501.

Patented Nov. 19, 1889.



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(No Model.)

4 Sheets—Sheet 3.

T. Z. COLE.
DREDGING MACHINE.

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Fig. 9.
ON LINE 4-4

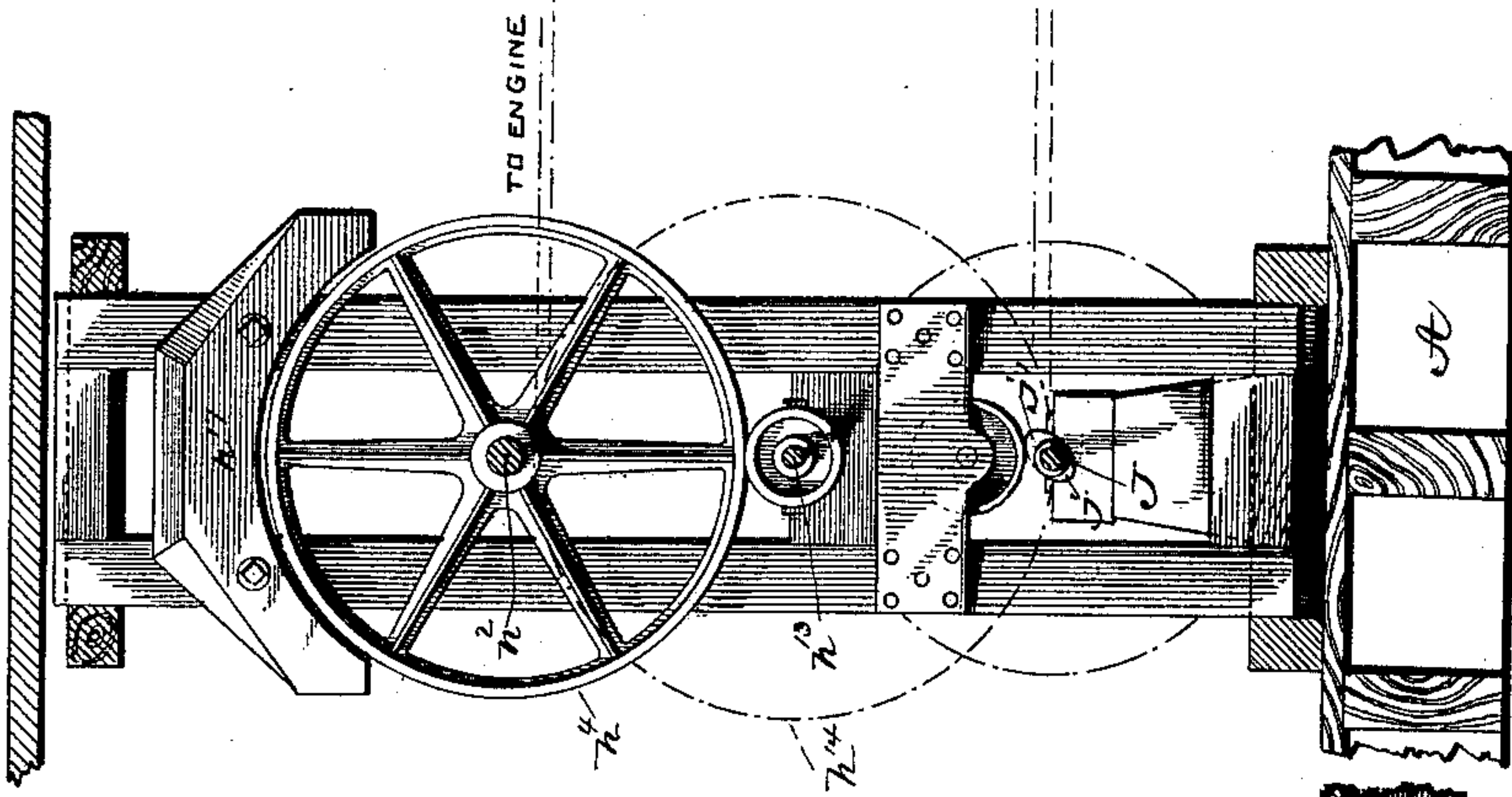
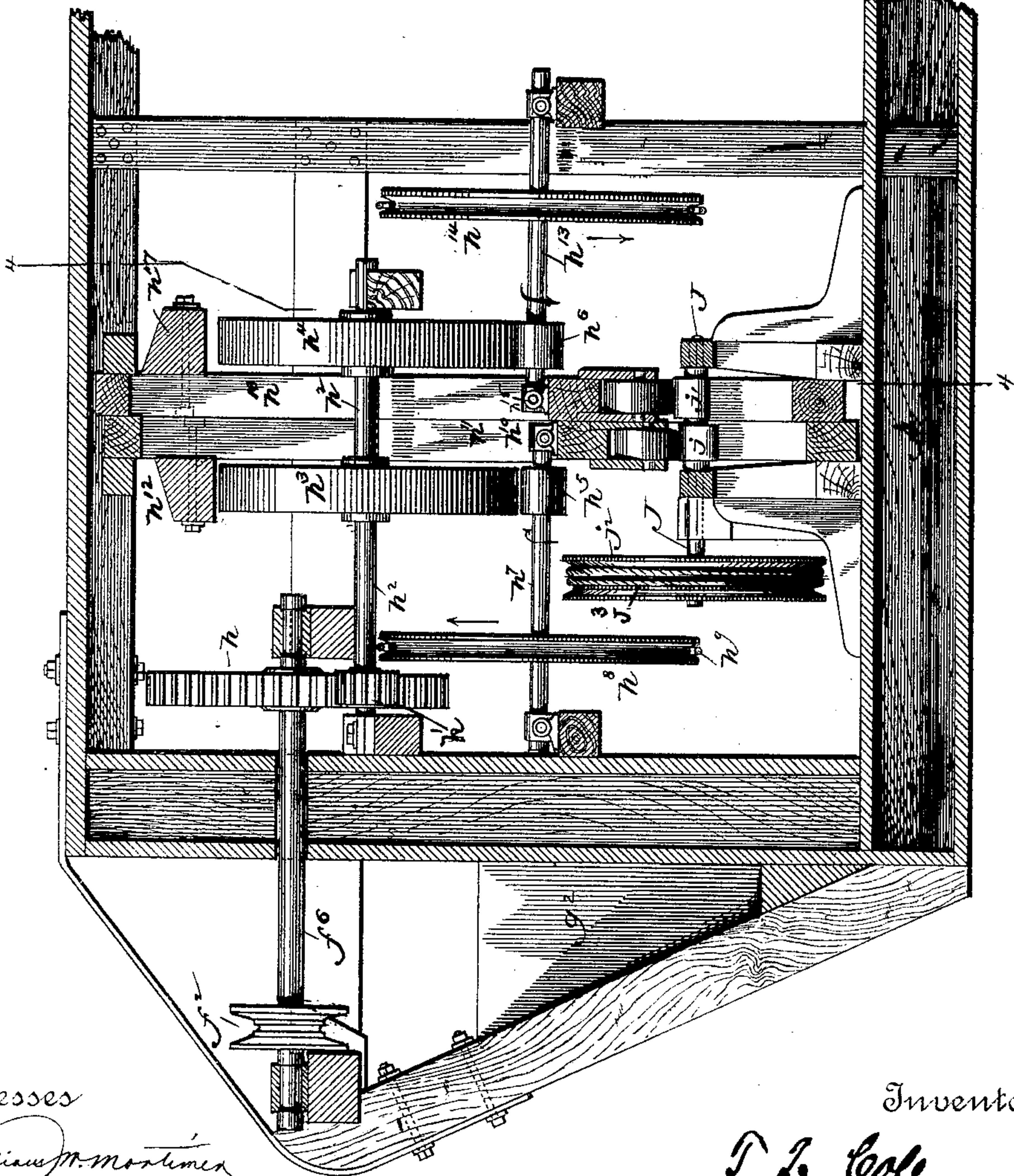


Fig. 8.
ON LINE 2-2



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(No Model.)

4 Sheets—Sheet 4.

T. Z. COLE.
DREDGING MACHINE.

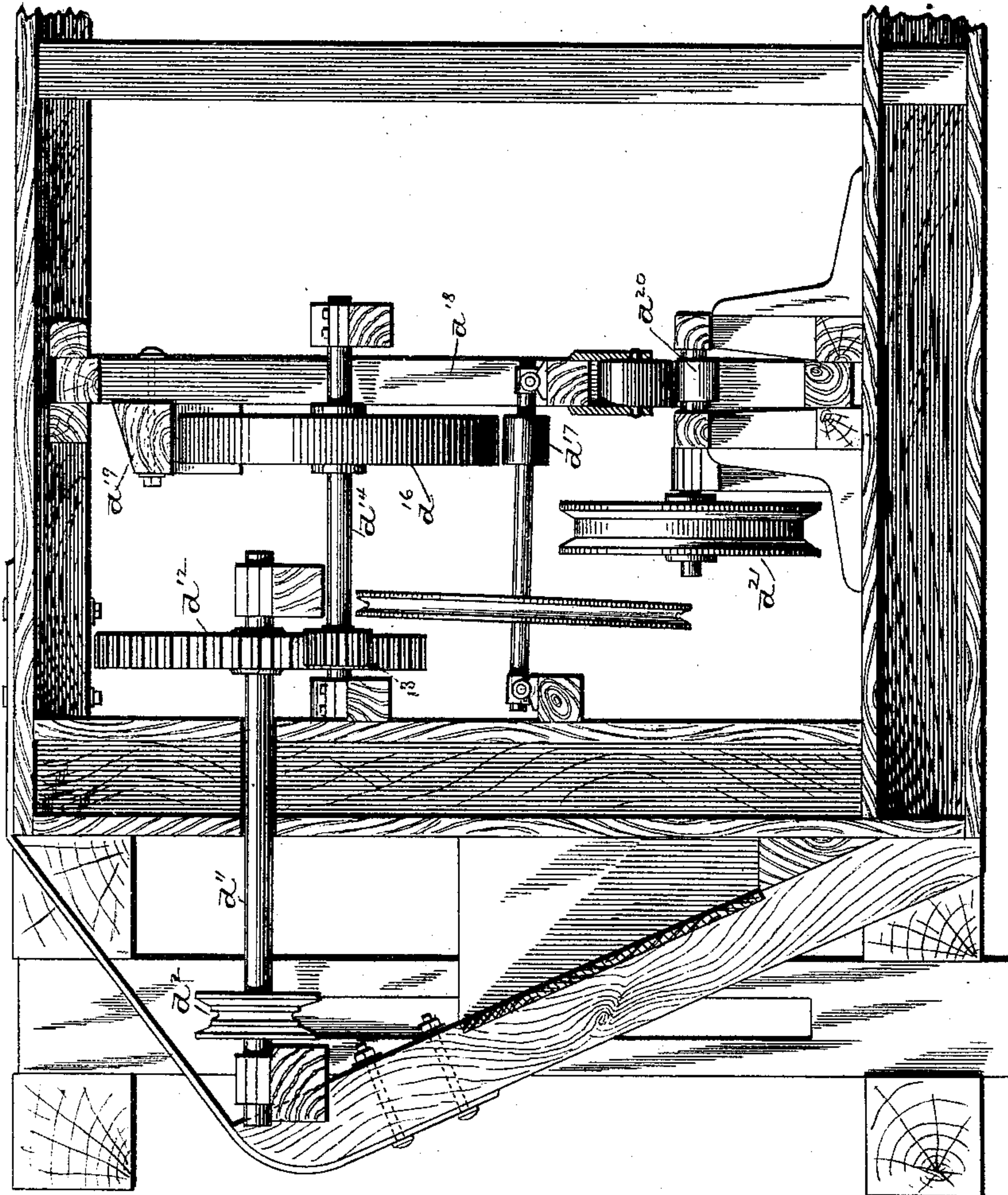
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Fig. 10.



Fig. 11.



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UNITED STATES PATENT OFFICE.

THOMAS Z. COLE, OF NEW ORLEANS, LOUISIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JAMES E. CAMPBELL AND DANIEL McCONVILLE.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 415,501, dated November 19, 1889.

Application filed February 14, 1889. Renewed October 28, 1889. Serial No. 328,365. (No model.)

To all whom it may concern:

Be it known that I, THOMAS Z. COLE, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain
5 Improvements in Dredging - Machines, of which the following is a specification.

In the operation of dredging-machines, particularly those which employ a laterally-swinging chain of buckets, it is necessary
10 that the scow or hull shall be held securely in position and gradually advanced as the work progresses. The most satisfactory means yet devised for anchoring and propelling the scow are upright spars jointed to the
15 boat and arranged to operate with a walking action on the bed or bottom. Heretofore the means employed for controlling and operating the spuds have been of an unsatisfactory character, the action being in some cases
20 unreliable and in others attended with great labor on the part of the attendants. The aim of my invention is to avoid these defects and provide a simple mechanism through which the power of the engine may be applied, under
25 easy control of the attendant, to operate and hold the spuds as occasion may demand.

In the accompanying drawings, Figure 1 is a side elevation of an excavator-scow provided with my improvement. Fig. 2 is a diagram illustrating the manner of advancing
30 the forward spud. Fig. 3 is a top plan view showing the guides and operating devices of one of the rear spuds. Fig. 4 is a side elevation, on a larger scale, showing one of the rear
35 propelling-spuds and connections for operating the same. Fig. 5 is a top plan view of the spud and its supporting-carriage. Fig. 6 is a cross-section through the spud on the line 1 1 of Fig. 4, looking in a downward direction.
40 Fig. 7 is a plan view of a portion of the gearing for operating the spud. Fig. 8 is a cross-section on the line 2 2 of Figs. 1 and 3, showing the driving and reversing mechanism to control the spud on one side of the
45 boat. Fig. 9 is a cross-section on the line 4 4 of the preceding figure, h^{14} and J^2 shown in dotted lines. Fig. 10 is an elevation of the cams for reversing the motion of the gearing. Fig. 11 is a sectional elevation of the gearing
50 employed for lifting the spuds out of action.

Referring to the drawings, A represents a scow or hull, which may be of any ordinary construction, and provided with dredging machinery of any suitable character.

B represents a forward spud, which acts
55 solely to prevent the scow from swinging laterally. It consists simply of a spar passing down through guides on the side of the scow and bearing at its lower end on the bottom. These guides may be varied in detail, provided only they prevent the spud from tipping
60 sidewise, but permit it to tip forward and backward as the scow moves endwise. As shown in the drawings, they consist of timbers $b b'$, bolted to the scow and converging
65 toward the upper ends to embrace and form a fulcrum for the spud, and of horizontal guide-timbers $b^2 b^3$, lying in a fore-and-aft direction against the sides of the spud.

The spud stands primarily in the position
70 shown in Fig. 1; but as the scow advances its upper end is carried forward therewith until it assumes the forward inclination shown in Fig. 2. When this second position is reached, the lower end must be lifted and stepped forward.
75 This is accomplished by means of chain D, attached to the lower end of the spud and carried thence upward and forward over guide-pulleys d to an operating-wheel d' , which may be actuated from the engine in any suitable
80 manner, although the preferred connections are hereinafter described. When the chain is drawn upward, it lifts the spud and causes the same to swing forward at the lower end, so that when the chain is released the spud
85 again descends to the bottom in the advanced position. The rear spud C is also connected to the scow by guides, which prevent lateral motion, but permit it to tip backward and forward while in action. These guides may
90 be varied in detail, provided they afford a fulcrum or bearing through which the spud operates with a lever action on the scow. In the form shown the guides consist mainly of the horizontal fore-and-aft guide-bars $c c'$
95 and the converging stop-bars $c^2 c^3$, all bolted securely in place. The spud slides freely up and down through an encircling yoke c^4 , sustained by horizontal trunnions c^5 , so that it may rock with the spud as the latter changes
100

its inclination. At a higher level the spud slides freely through a guide F, mounted on sustaining-wheels f , traveling on the top guide-bars, so that it may be carried readily forward and backward. A chain f^* is secured at its ends to the traveling guide F, and extended forward and backward around guide-pulleys f' f^2 , and also around intermediate pulleys f^3 f^4 f^5 , by which the lower part of the chain is deflected to one side of the spud, as shown in dotted lines in Fig. 3. The pulley f' is connected by reversing-gear, hereinafter described, with the engine, and serves, through the chain, to operate and to hold the guide F, which in turn controls the spud, moving its upper end forward or backward, so that the boat is carried positively forward or backward or held stationary, as occasion may require. A lifting-chain G, attached to the lower end of the spud, extends upward through the yoke c^4 , over a winding-pulley g' to a box g^2 , in which it accumulates as the spud rises.

Passing now to the mechanism for operating the spud-actuating pulley f' , attention is directed to Figs. 4, 8, 9, and 10. The pulley f^2 has its shaft f^6 extended inboard and provided with a fixed gear h , which constantly engages a driving-pinion h' , fixed on a shaft h^2 , mounted in stationary bearings and carrying two friction-wheels h^3 and h^4 . These wheels receive motion alternately and in reverse directions from friction-pulleys h^5 and h^6 . Pulley h^5 is fixed on a driving-shaft h^7 , carrying a pulley h^8 , through which it receives constant motion by a belt h^9 or other connections of any ordinary character from the engine I or other motor. The shaft h^7 is mounted at one end in a stationary bearing, but at the other end is sustained in bearing h^{10} on a vertically-sliding frame h^{11} , the movement of which throws the pinion h^5 into or out of engagement with the wheels h^3 . This sliding frame carries at its top a brake-shoe h^{12} , to act upon and hold wheel h^3 , and thereby the spud whenever the frame is lowered to an extreme position. The second wheel h^4 is driven and held by devices similar to those just described, the shaft h^{13} of its driving-pinion being constantly driven from the engine by pulley h^{14} , and mounted in bearing h^{15} on a vertically-sliding frame h^{16} , having a brake-shoe h^{17} at the top. As the driving-pulleys h^5 h^6 turn in reverse directions, each must be thrown out of action as the other is brought into action, and when the spud is to be held at rest both pulleys must be disengaged and one or both of the brakes brought into action. These results are secured by means of a rock-shaft J, underlying the sliding frames and provided with two cams j j' , secured in reverse relations to each other, as in Fig. 10, and arranged to act against rollers in the respective frames. A pulley j^2 is secured to the cam-shaft and provided with a controlling-cord j^3 , extending from its opposite sides to the deck or other point to admit of its being conveniently oper-

ated by hand. When the cams are turned by these connections to an intermediate position, both pinions are lowered out of action and the brakes seated on the wheels, which are thus held firmly and caused through the intermediate parts to hold the spud-guide F and the spud. Thus the scow is retained securely in position.

By turning the cam-shaft to the right or left one or the other of the pulleys will be thrown into action and the chain caused to throw the top of the spud forward or backward, as demanded. When either cam acts to raise the corresponding pulley into action, the heel of the other cam lifts the frame of the other pulley sufficiently to throw its brake out of action, without, however, engaging its pulley. Thus it is that both brakes are raised when either pulley is engaged.

The winding-pulleys d^2 and g' for lifting the spuds require to be driven only in one direction, as the spud will descend by gravity when released. I therefore actuate each of them by a mechanism such as shown in Fig. 11, similar to that in Figs. 8 and 9, except that there is no provision for reversing the motion. Pulley d^2 has its shaft d^{11} provided with gear d^{12} , engaging pinion d^{13} on shaft d^{14} , carrying friction-wheel d^{16} . Driving-pulley d^{17} has its shaft in a bearing on sliding frame d^{18} , carrying brake d^{19} and raised by cam d^{20} , the shaft of which carries wheel d^{21} , to be actuated by a hand-line.

Having thus described my invention, what I claim is—

1. In combination with a propelling and anchoring spud, the scow having the fore-and-aft guides and a fulcrum for the spud, the movable truck or guide through which the spud slides, the chain leading in both directions from said guide, the chain-sustaining pulleys, and suitable driving and reversing gear connected with said chains.

2. The scow, the sliding and tipping spud fulcrumed thereto, and the traversing guide through which the spud slides, in combination with the chain for moving said guide to and fro, its sustaining-pulleys, and a reversible driving-gear, substantially as described, connected with one of said pulleys.

3. The scow, the spud, the guide or fulcrum through which the spud slides, the traveling guide through which the spud slides, the operating-chain attached thereto, sustaining-pulleys for the chain, and a shaft geared to one of said pulleys, in combination with the two friction-wheels, friction-pulleys arranged to rotate in reverse directions, movable supports through which said pulleys are sustained, and a rock-shaft having cams to raise said supports alternately, whereby the spud may be caused to move forward or backward at will.

4. In combination with the tipping-spud, its actuating-chain and suitable connecting-gear, the friction-wheels to drive the same, the friction-pulleys and their shafts, the movable

frames for adjusting said shafts, the brakes thereon, and the shaft provided with cams to raise and lower said frames, whereby the spud-controlling chain may be driven in either direction or secured immovably at will.

5 5. In combination with the scow and a propelling and anchoring spud fulcrumed thereon, a traveling guide through which the spud slides, a chain for moving said guide to and
10 fro, a wheel geared to said chain, and a brake acting on said wheel, whereby the spud may be secured in any desired position.

6. In combination with the scow and a vertically-movable spud fulcrumed thereon, a traveling guide through which the spud slides, 15 a chain leading fore and aft from said guide, and supporting-pulleys for said chain.

In testimony whereof I hereunto set my hand, this 13th day of February, 1889, in the presence of two attesting witnesses.

THOMAS Z. COLE.

Witnesses:

W. R. KENNEDY,
PHIL. T. DODGE.