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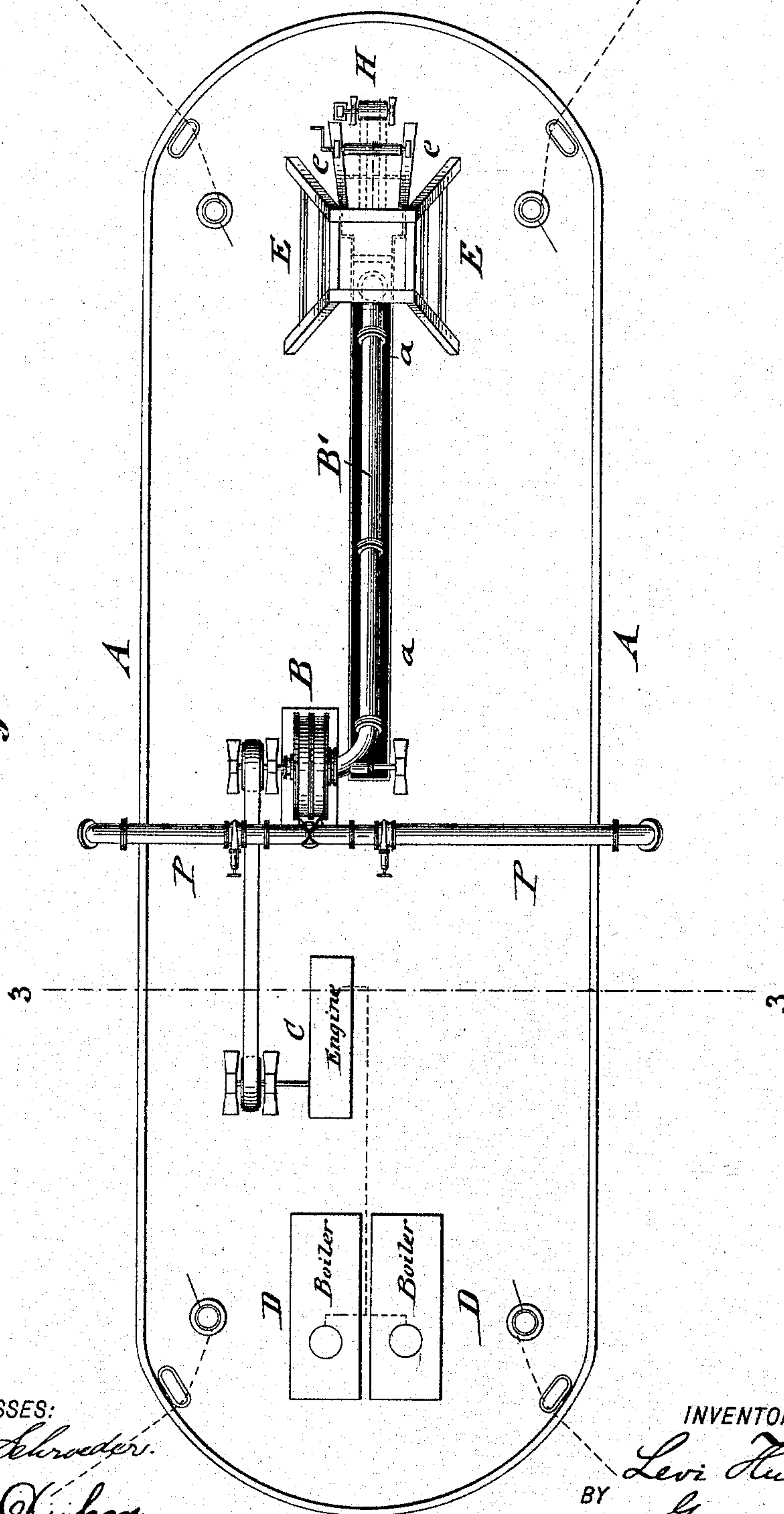
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L. HUSSEY.
STEAM DREDGE.

No. 526,531.

Patented Sept. 25, 1894.

Fig: 1.



WITNESSES:

Charles Schroeder.
William D. Linn

INVENTOR

BY *Levi Hussey*
George & Ragsdale
ATTORNEYS.

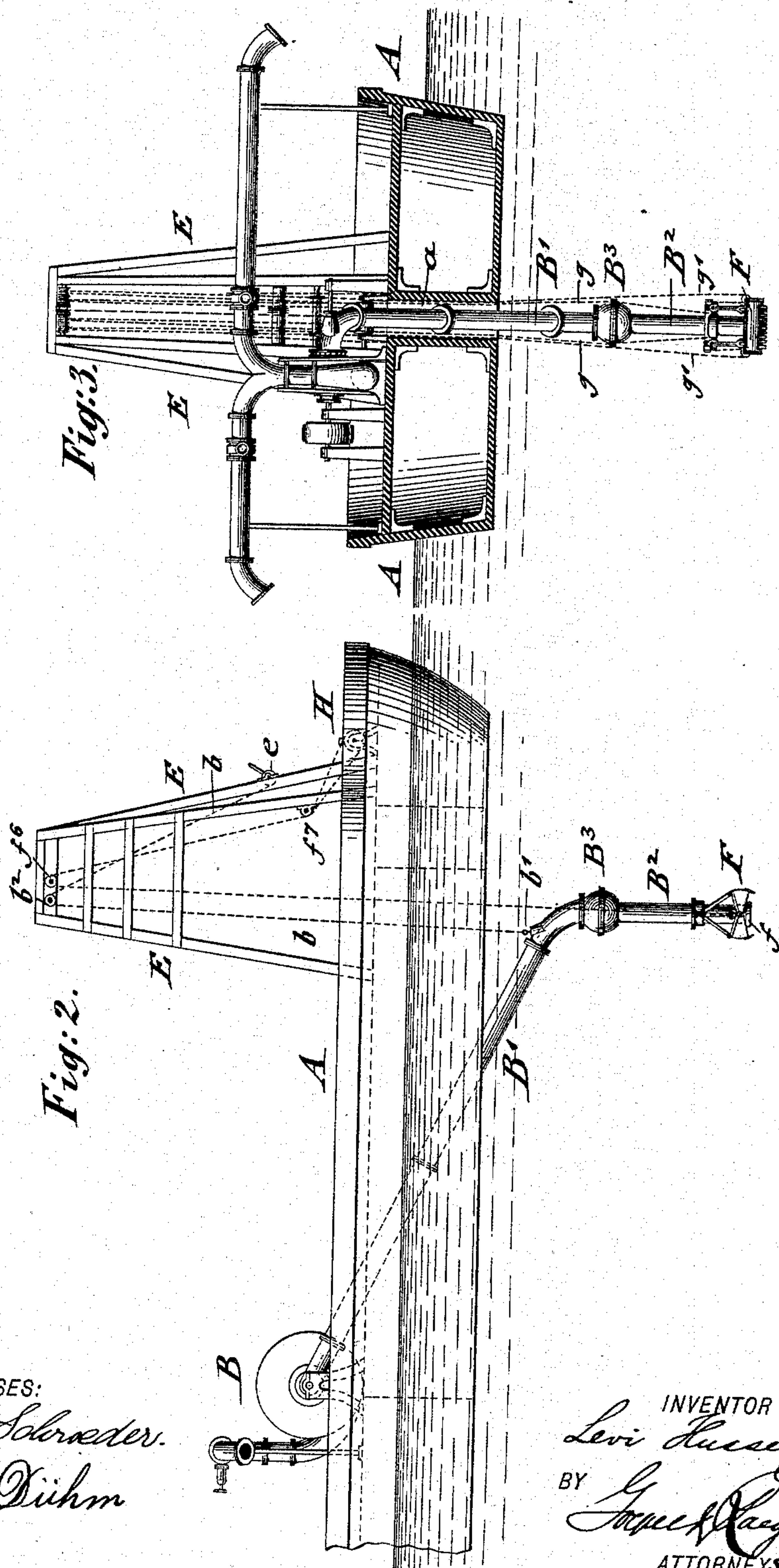
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STEAM DREDGE.

No. 526,531.

Patented Sept. 25, 1894.



WITNESSES:

Charles Schroeder.
William Dühm

INVENTOR

Levi Hussey

BY

James H. Ragsdale
ATTORNEYS.

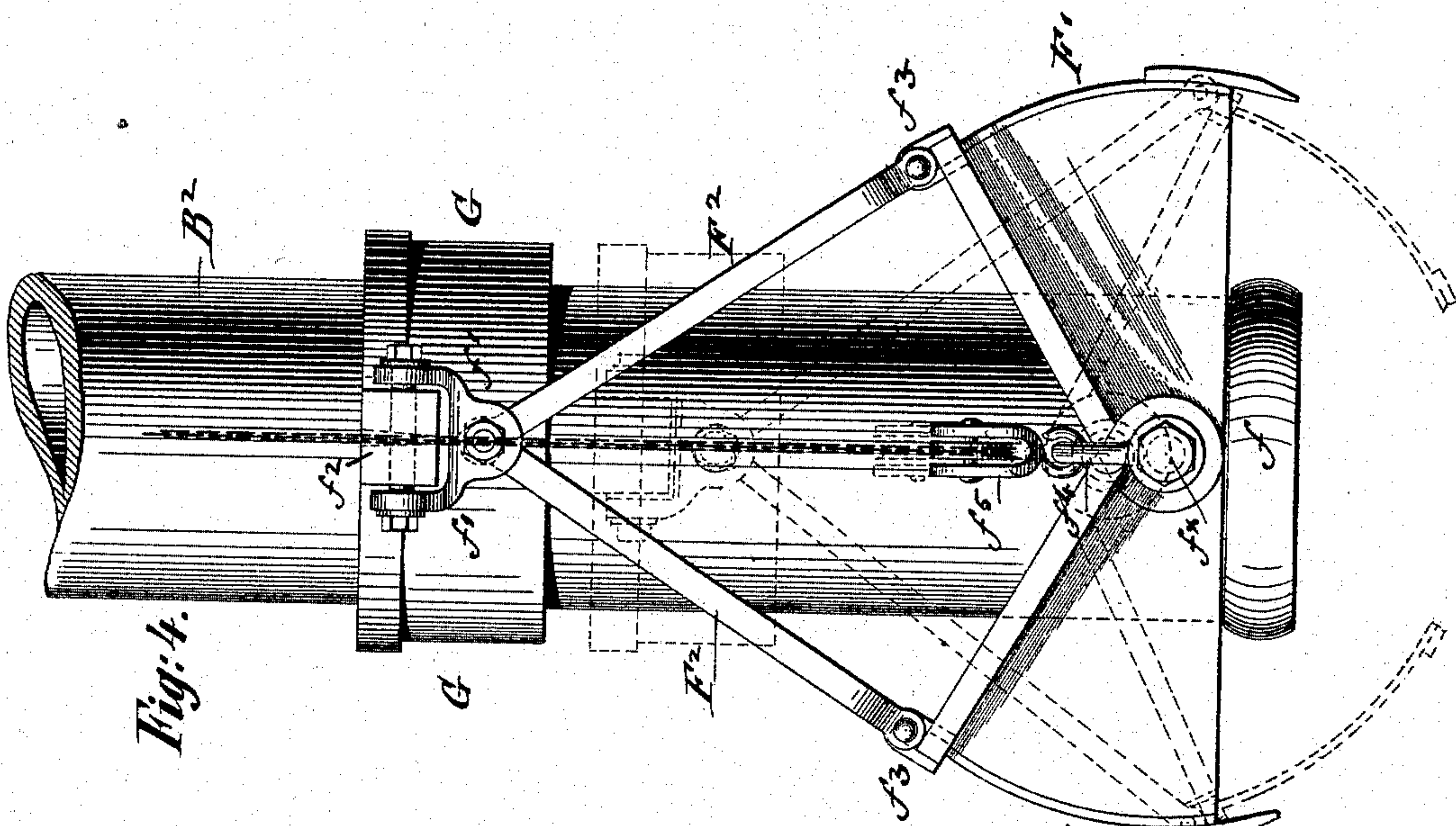
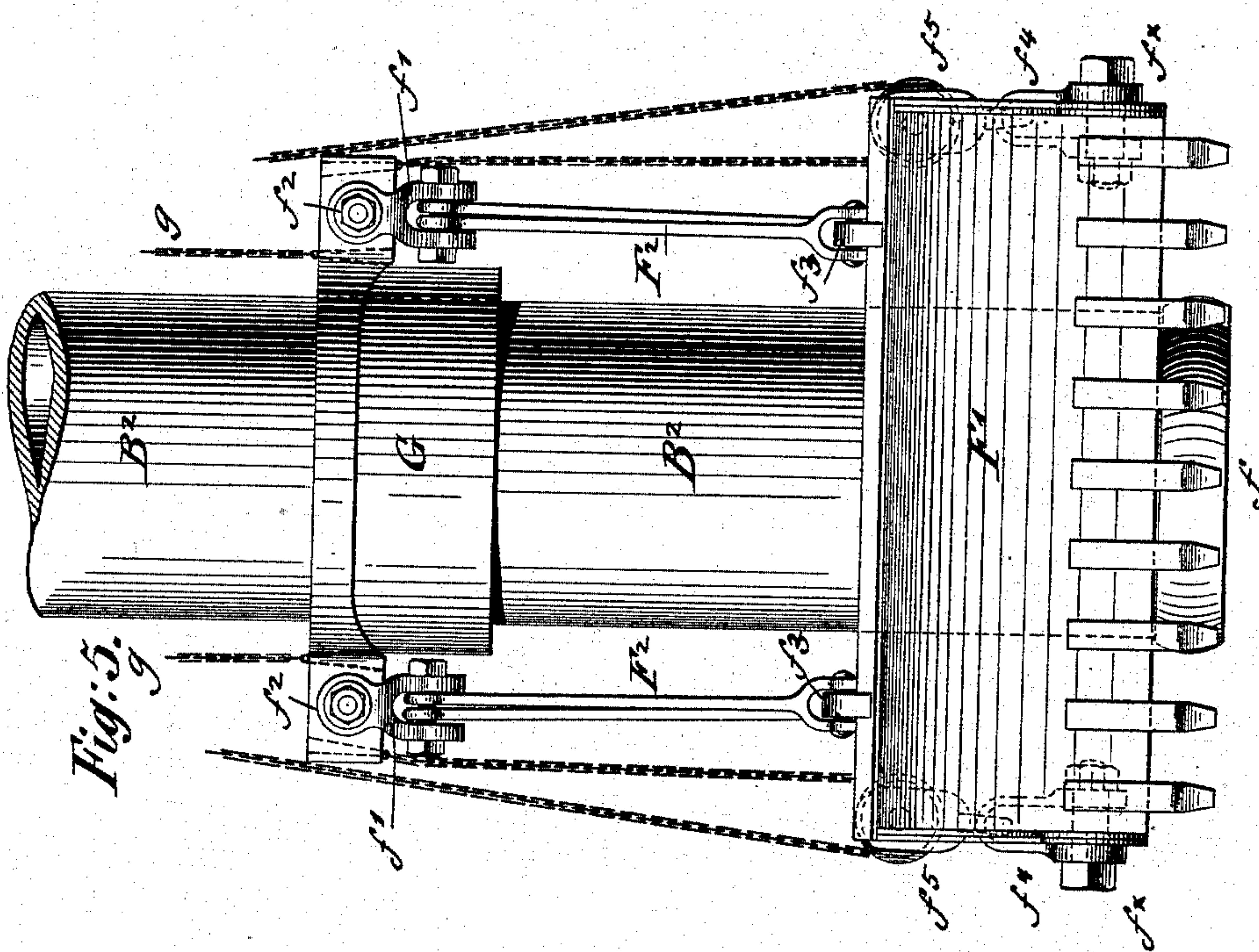
(No Model.)

3 Sheets—Sheet 3.

L. HUSSEY.
STEAM DREDGE.

No. 526,531.

Patented Sept. 25, 1894.



WITNESSES:

John H. Rennie.
Charles Schroeder.

INVENTOR

Levi Hussey
BY
Gospel & Reger
ATTORNEYS.

UNITED STATES PATENT OFFICE.

LEVI HUSSEY, OF NEW YORK, N. Y., ASSIGNOR TO THE MINING AND
DREDGING POWER COMPANY, OF WEST VIRGINIA.

STEAM-DREDGE.

SPECIFICATION forming part of Letters Patent No. 526,531, dated September 25, 1894.

Application filed April 5, 1892. Renewed July 15, 1893. Again renewed January 29, 1894, and again renewed August 17, 1894.
Serial No. 520,616. (No model.)

To all whom it may concern:

Be it known that I, LEVI HUSSEY, a citizen of the United States, and a resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Steam-Dredges, of which the following is a specification.

This invention has reference to an improved steam-dredge of that class, in which the suction-pipe is arranged in a central opening of the barge and raised or lowered by hoisting devices on a suitable derrick independently of the steam-pump to which the same is connected; and the invention consists of the combination, of a centrifugal pump supported on a barge, a suction-pipe connected with said pump and extending through a longitudinal center-opening of the same in downward direction, the vertical end-section being connected by a flexible joint with the inclined section of the suction-pipe, and means for hoisting or lowering the suction pipe.

The invention consists, secondly, of the combination, with the lower end of the suction-pipe, of a grappling fork or bucket, guided on the lower end of the suction-pipe and composed of oscillating jaws having teeth, said bucket being operated by two sets of chains, one set of chains serving to open the jaws by raising the guide-collar from which the actuating levers of the jaws are suspended while the other set of chains serves to close the jaws, by lowering the guide-collar and pulling up the pivots of the jaws. Both sets of chains pass in opposite direction around a suitable drum on the barge, so as to produce the joint action of both sets of chains by turning the winding-drum in one or the opposite direction, as will be fully set forth hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a plan of my improved steam-dredge, showing the same arranged on a barge. Fig. 2 is a side-elevation of the same. Fig. 3 is a vertical transverse section on line 3 3, Fig. 1; and Figs. 4 and 5 are respectively an end-elevation and a side-elevation of a grappling hook or bucket arranged at the end

of the suction-pipe, showing the same drawn on a larger scale.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents a barge or other vessel, which is moored in a suitable manner to the place where the dredging operation is to be performed.

A centrifugal pump B is arranged on the barge and operated by belt and pulley-transmission from a suitable steam-engine C, which receives its steam from the boilers D that are arranged at one end of the barge. At the other end of the barge is arranged a derrick E with its hoisting-device *e* for the suction-pipe B' which is connected by a pivot joint at its upper end with the centrifugal pump B and adapted to swing in a vertical plane independently of the pump B, said suction-pipe being applied for this purpose by suitable stuffing-boxes to the casing and shaft of the pump.

The suction-pipe B' extends through a longitudinal central opening *a* of the barge A in downward direction, it being supported by a chain *b* that is attached to a ring *b'* on the curved lower end of the suction pipe B', said chain being guided over a pulley *b²* at the top of the derrick, on to the winding-drum of the hoisting device that is supported in bearings of the derrick, as shown clearly in Figs. 1 and 2. The lower vertical section B² of the suction-pipe B' is connected by a flexible joint B³ with the curved end of the suction pipe, said section being provided with a fixed collar *f* at its lower end, and with a grappling fork or bucket F that is formed of two jaws F' each of which is armed with a row of sharp teeth, said jaws being suspended by two pairs of lever arms F² from pivot links *f'*, of a guide-collar G on the lower section B² of the suction-pipe B'. The pivot links *f'* are again pivoted to lugs *f²* of the guide-collar G, while the lower ends of the lever arms F² are pivoted to fixed eyes *f³* on the jaws F'.

The guide-collar G is suspended on chains *g g* which are attached to the lugs *f²*, as shown in Fig. 5, while the pivots *f'* of the jaws F' are connected by links *f⁴* with pulley-blocks *f⁵*, which latter are suspended from chains *g' g'*

that are also attached to the lugs f^2 of the guide-collar G; passed through the pulley blocks f^5 , and then in upward direction over guide-pulleys $f^6 f^7$, on the derrick E, to a winding-drum H, which is located at the base of the derrick in close proximity to the hoisting-device of the suction-pipe B', as shown in Fig. 2. The chains $g g$, are also conducted over guide-pulleys on the derrick to the winding-drum H, and are wound in opposite direction to the chains $g' g'$ around the winding-drum H; so that when the same is turned in one direction, the grappling fork F is raised along the lower end B² of the suction pipe B', and opened; while, when the winding-drum is turned in opposite direction, the grappling fork is lowered and closed, as shown in Fig. 4, in which the dotted lines show the lowered and the full lines the raised position of the grappling fork F. The simultaneous winding and unwinding of the chains $g g$ and $g' g'$ on and from the drum H produces the raising of the guide collar G and the lowering of the pulley-blocks f^5 from which the pivots of the jaws are suspended, so that the jaws of the grappling fork or bucket F are opened, while the simultaneous unwinding of the chains g and winding up of the chains g' on the drum H, produces the lowering of the guide-collar and the lifting of the pulley-blocks and thereby the closing of the jaws as shown in dotted lines in Fig. 4. By the closing of the jaws, the teeth thereof enter into the ground and loosen the same sufficiently so that it can be drawn by the pump into the suction-pipe, on the opening of the jaws. The quick closing and opening of the jaws by the quick turning of the winding drum H first in one then in the opposite direction keeps up the loosening of the ground and feeding of the same to the suction-pipe.

The hoisting-device e of the suction-pipe B' raises or lowers the same so as to adapt its mouth and the grappling fork on the lower section of the same to the uneven surface of the ground to be dredged, while the winding drum H serves for the purpose of raising or lowering the guide-collar on the end of the suction pipe so as to open or close the grappling fork and loosen the ground sufficiently for the suction action of the pump.

Whenever the grappling fork has a quantity of ground loosened sufficiently it is sucked in by the pump B and conducted through one of the branches of the discharge-pipe P to one side or the other of the barge into a scow, that is placed alongside of the barge, said discharge-pipe being provided with gate-valves, so as to permit the flow of the liquid mass raised through the suction pipe to the scow at either side of the barge.

The operation of my improved steam-dredge is as follows: One attendant is stationed at the hoisting-drum for the suction pipe and the winding-drum for the grappling fork and lowers the suction pipe into the proper position for the action of the grappling fork. By

turning the winding-drum alternately in opposite directions, the ground is loosened by the grappling fork and supplied to the mouth of the suction pipe and conveyed with a certain quantity of water through the centrifugal pump and the discharge-pipe into the scow. The winding drum of the grappling fork may be operated by hand or steam, while the centrifugal pump has a continuous motion, so as to take up any loose matter, such as sand and similar substances from the bottom of the river or other water course during the time the grappling fork is in raised and open position and while the suction-end of the suction pipe is close to the ground, while by the closing of the grappling fork the more rigid and solid portions of the bottom are taken up and sucked in with a sufficient quantity of water that serves for the lubrication of the same in the suction-pump and thence through the discharge-pipe into the scow.

By the arrangement of the grappling fork in connection with the lower end of the suction pipe a very effective loosening of the ground on the bottom of a channel, river, canal or other water course is obtained and thereby the very quick and effective dredging of the channel to the required depth produced.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a barge having a longitudinal center-opening passing vertically through the same, of a pump on said barge near one end of said opening a suction-pipe jointed to the casing of the pump and extended through the center-opening of the barge, a lower end section connected by a flexible joint with the lower end of the main-section of the suction-pipe, a derrick at the opposite end of the center-opening of the barge, a hoisting-device connected with the main-section of the suction-pipe and supported on the derrick, a valved discharge-pipe connected with the discharge-opening of the pump, a grappling-fork applied to the lower end of the suction-pipe and means for opening or closing the grappling-fork, substantially as set forth.

2. The combination, with a barge having a longitudinal center-opening, a pump on said barge, a vertically-swinging suction-pipe passing through said opening, a lower vertical section connected by a flexible joint with the main-section of the suction-pipe, a collar guided on the lower section, a grappling-fork suspended from said collar, chains applied to the guide-collar and fork respectively, a derrick on the barge provided with guide-pulleys for said chains and a winding-drum on which said chains are wound in opposite direction, so that by the alternate turning of the drum in one or opposite direction the raising or lowering of the guide-collar and the opening or closing of the grappling-fork is produced, substantially as set forth.

3. The combination, with the lower end section of a suction-pipe having a fixed collar at its lower end, of a guide-collar applied thereto, a grappling-fork, the jaws of which
5 are suspended from said collar, chains attached to the guide-collar and fork respectively and a winding drum on which the chains are wound in opposite direction, substantially as set forth.

10 4. The combination of the lower end section of a suction-pipe, having a fixed collar at its lower end, of a guide collar on said end section, a grappling-fork, the jaws of which are suspended by lever-arms from said guide-
15 collar, a set of chains attached to said guide-collar, a second set of chains also attached to

said collar and passed through pulley blocks connected to the pivots of the jaws and a winding drum on which both sets of chains are wound in opposite direction so as to produce by the alternate turning of said drum
20 the alternate raising or lowering of the guide-collar and opening and closing of the fork substantially as set forth.

In testimony that I claim the foregoing as
25 my invention I have signed my name in presence of two subscribing witnesses.

LEVI HUSSEY.

Witnesses:

PAUL GOEPEL,
OSCAR F. GUNZ.