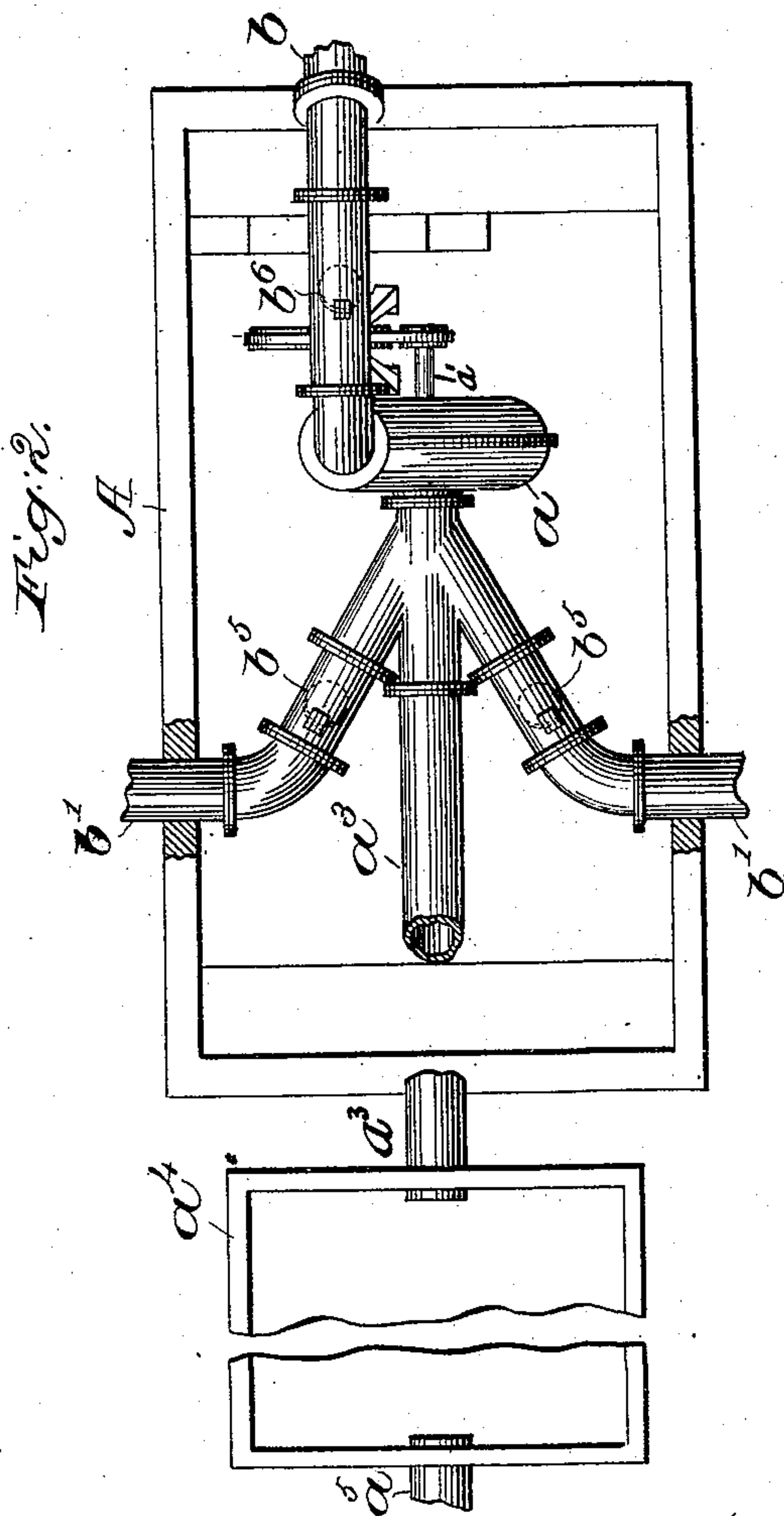
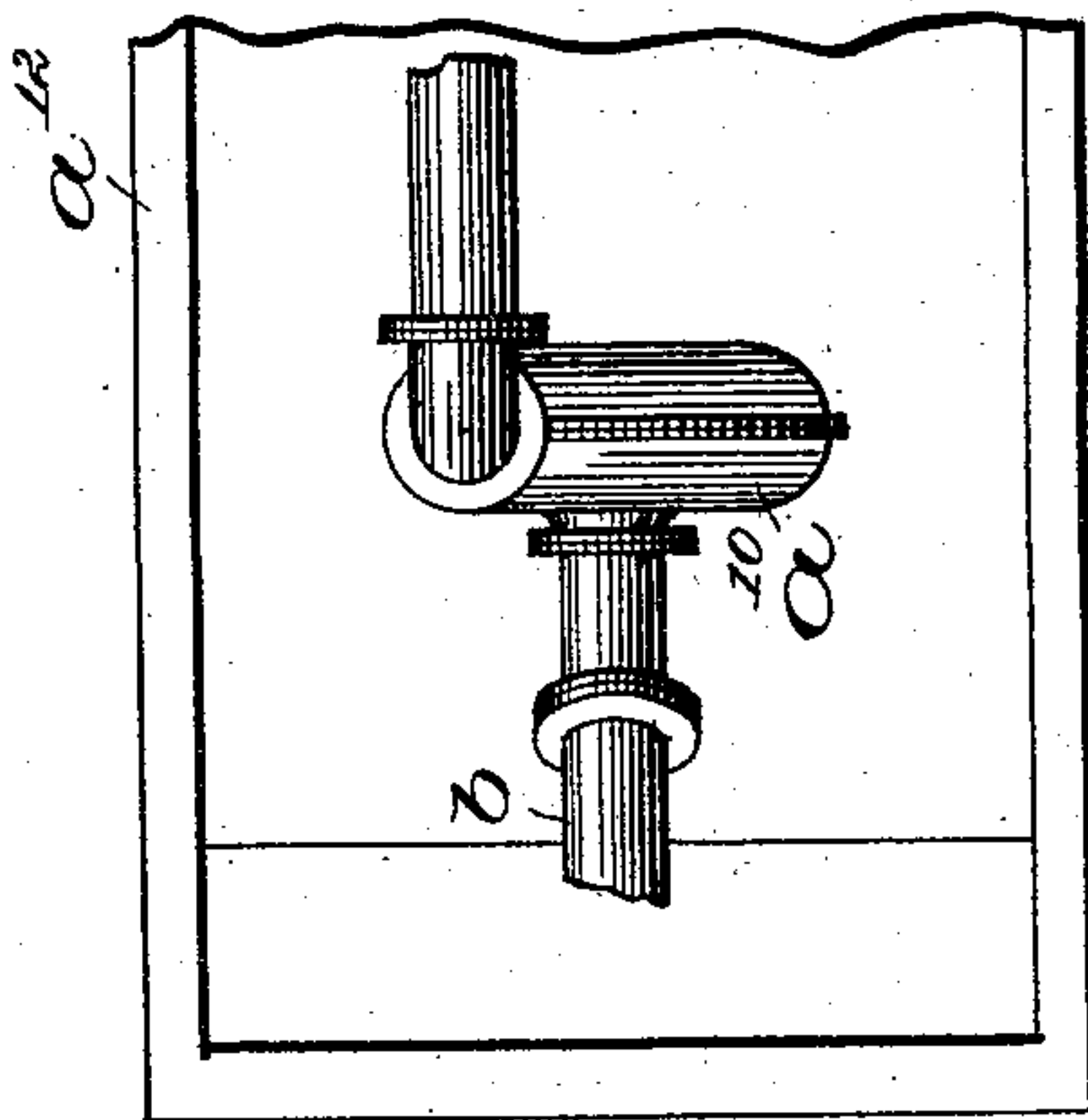
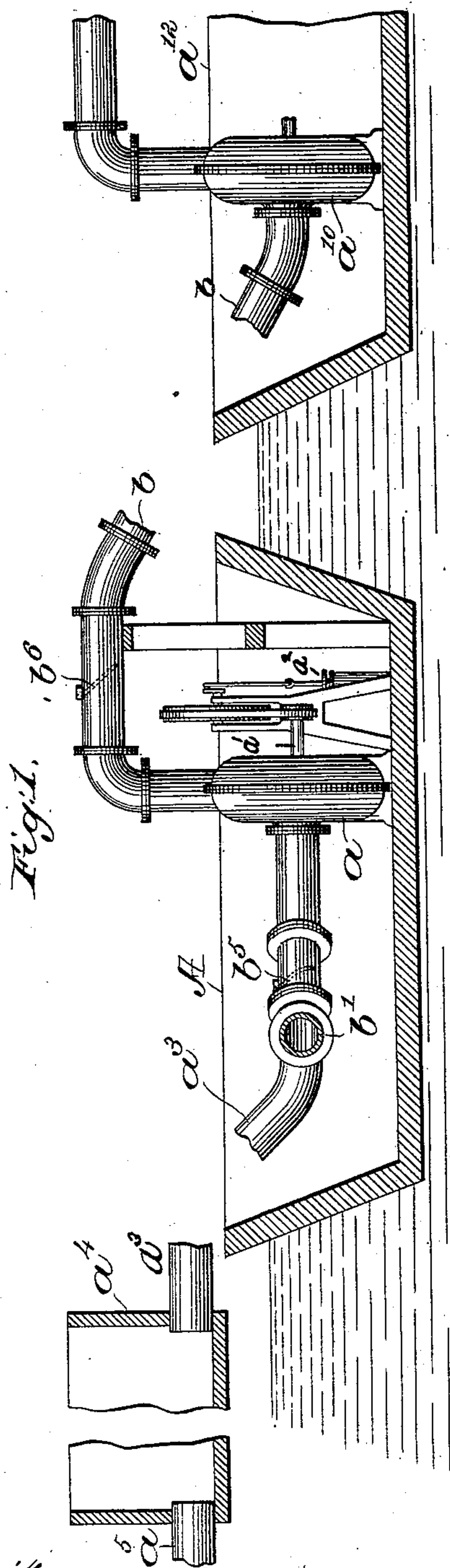


(No Model.)

F. A. LOCKWOOD.
DREDGING APPARATUS.

No. 472,735.

Patented Apr. 12, 1892.



Witnesses.
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UNITED STATES PATENT OFFICE.

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DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 472,735, dated April 12, 1892.

Application filed June 4, 1890. Serial No. 354,233. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC A. LOCKWOOD, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Dredging Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention is an improvement in dredging apparatus of that class shown and described in United States Patent of J. A. Ball, No. 299,945, dated June 10, 1884, in which the dredged material is discharged into an elevated
15 hopper, from which the material in a stream of water supplied to the hopper is carried by gravity to the shore or to any desired point for deposit. With the class of apparatus referred to, wherein the material admixed with
20 water is carried away by gravity, it is necessary to employ an elevated frame-work or tower, to which the hopper is secured near its top or upper end in order to obtain the required force of gravity to carry the mixture
25 of water and dredge material to its place of deposit, which place of deposit is of necessity limited as to elevation and distance. The apparatus with a tower or elevated frame-work is not only expensive to build and limited in
30 its scope, but the entire power of the machine is required to carry the material to the shortest distance or to the slightest elevation with no means to increase that power if it is desired to carry the material beyond or above
35 the limited scope of the machine; and it is the object of this invention to provide apparatus whereby the elevated frame-work or tower may be dispensed with and the cost of the dredging apparatus thereby materially
40 cheapened, and whereby the power of the machine may be increased or diminished at pleasure, and also whereby the material may be carried to such distance or to such elevation as may be necessary with the use of such
45 power and only such power as will carry the material to the point of deposit required.

50 In the machine herein to be described, the efficiency of which depends on gravity and not on atmospheric pressure, as is the case with all dredging-pumps in use, so far as known to me, I have provided a dredging ap-

paratus with a preferably rotary pump placed with its inlet below the level of the water in which the vessel floats and with a discharge-pipe, said pump having a suction-pipe connected at its outer end to a hopper to carry
55 away from it in a stream of water the dredged material which is discharged into it, which hopper may be elevated any convenient distance above the said water-level, and I provide the said pump with one or more water-inlet pipes below the water-level, they having
60 suitable valves which are closed by pressure of dredge material from the hopper when the supply is maintained above the said water-level, but which are opened by pressure of
65 the water when the dredge material gets below the said water-level to admit a supply of water to the pump the moment the supply of dredge material is exhausted to thereby properly
70 wash the discharge-pipe clear of said dredge material, which might otherwise settle therein and stop it up.

My invention therefore consists in the combination, in a dredge, scow, or other mechanism adapted to carry away dredge material,
75 of the following instrumentalities, viz: a hopper to receive dredge material, a pipe to supply a stream of water to said hopper, a pump having its inlet below said hopper, a pipe
80 from said hopper to said pump, and a discharge-pipe, substantially as will be described.

Other features of my invention will be pointed out in the claim at the end of this specification.

85 Figure 1 in section and elevation shows a sufficient portion of dredging apparatus or scow to enable my invention to be understood, and Fig. 2 a top or plan view of a portion of the apparatus shown in Fig. 1.

90 A represents a barge or scow, which may be of any usual or well-known construction, it being provided in accordance with my invention, with preferably a rotary pump a , having its shaft a' connected to and rotated by
95 a suitable engine a^2 , carried by the said barge. The pump a is placed with its inlet below the level of the water in which the vessel floats, and has a suction-pipe a^3 connected at its outer end to a hopper a^4 , placed above said
100 water-level, said pipe forming the discharge-pipe for said hopper, the said hopper being

adapted to receive mud and other dredge material from any dredging apparatus, (not shown;) or the said hopper may be filled or partially filled with material by laborers or other means, the said hopper being provided with a water-inlet pipe a^5 , by which water is supplied to the hopper to mix with the dredge material and render the same capable of being forced through the discharge-pipe b of the pump. The said discharge-pipe may lead to the place of deposit for said material, or it may form the suction-pipe of another pump a^{10} , auxiliary to the first one, suitably located at a considerable distance from or height above the first barge or scow A , the said auxiliary pump, rotated by its own engine, forming with its own discharge-pipe one continuous discharge from the hopper a^4 to the place of deposit for said material, and by introducing additional auxiliary pumps with their engines the discharge from the hopper a^4 may be continued to any desired distance or carried up to any desired elevation for the deposit of material.

In order to prevent the discharge-pipe from becoming clogged up or choked by the material in it in case the supply of water and material from the hopper a^4 should cease or get below the water-level, the pump a is provided with one or more separate water-inlet pipes b' , there being two such inlet-pipes herein shown connected to the pipe a^3 below the water-level. Each water-inlet pipe b' , preferably extended through the side of the vessel into the water, is provided with a check or other valve b^5 , (shown by dotted lines,) which is normally closed by the passage of water and material from the hopper a^4 through the pipe a^3 , but which valve, as herein indicated, is automatically opened by pressure of the water in which the vessel floats as soon as the supply of material and water from the hopper a^4 gets below the said water-level. The water admitted through the inlet-pipe b' is forced through the discharge-pipe b and carries away with it any material in the said discharge-pipe. The discharge-pipe b is also provided with a check-valve b^6 to prevent the backward flow of material in case the pump a should stop before the material is cleared from the discharge-pipe.

When it is desired to carry the dredge material a long distance or to a high elevation, the discharge-pipe b may form the suction-pipe of a second pump a^{10} , located on any suitable support, as another barge or scow a^{12} , only a portion of which is shown in Fig. 1, and, if desired, the discharge-pipe of the auxiliary pump a^{10} may form the suction-pipe of another auxiliary pump, and so on, and in this way it will be seen that the dredge material may be carried to any desired distance or to any desired elevation.

The pump a and the auxiliary pumps may, and in practice will be, run until clear water issues from the discharge-pipe b .

By means of the pump a I am enabled to

dispense with an elevated frame or tower to support the hopper a^4 , and may use instead a hopper located at any convenient distance above the level of the water in which the dredge or scow floats, and by means of the pump a and auxiliary pumps I am enabled to carry dredge material for deposit to any desired distance and to any desired elevation.

I claim—

1. In a dredge, scow, or other mechanism adapted to carry away dredge material, the combination of the following instrumentalities, viz: a hopper to receive dredge material, a pump a , having its inlet below said hopper, a pipe a^3 from said hopper to the pump-inlet, and a discharge-pipe b , substantially as described.

2. The combination, in a dredge, scow, or other mechanism adapted to carry away dredge material, of the following instrumentalities, viz: a hopper a^4 to receive dredge material, a pipe a^5 to supply a stream of water to said hopper, a pump a , having its inlet below said hopper, a pipe a^3 from said hopper to said pump-inlet, a water-inlet pipe b' , having a valve b^5 and connected with the pipe a^3 below the water-level, and a discharge-pipe b , substantially as described.

3. The combination, in a dredge, scow, or other mechanism adapted to carry away dredge material, of the following instrumentalities, viz: a hopper a^4 to receive dredge material, a pipe or conduit a^5 to supply a stream of water to said hopper, a pump a , having its inlet below said hopper, a pipe a^3 from said hopper to said pump-inlet, a discharge-pipe b , and an auxiliary pump a^{10} in the line of said discharge-pipe and adapted to operate without breaking the continuity of discharge from the pump a , substantially as described.

4. The combination, in a dredge, scow, or other mechanism adapted to carry away dredge material, of the following instrumentalities, viz: a hopper a^4 to receive dredge material, a pipe a^5 to supply a stream of water to said hopper, a pump a , having its inlet below said hopper, a pipe a^3 from said hopper to said pump-inlet, a water-inlet pipe b' , having a valve b^5 and connected with the pipe a^3 below the water-level, a discharge-pipe b , an auxiliary pump a^{10} in the line of said discharge-pipe and adapted to operate without breaking the continuity of discharge from the pump a , and a check-valve b^6 , substantially as described.

5. In a dredging or digging machine, the combination of an excavating device, a hopper into which the excavating device delivers the spoil, and a discharge-pump having its inlet below the hopper, whereby a supply of material to the pump will be caused by gravity or hydraulic head-pressure, and a discharge-pipe connected to the pump, through which the spoil is forced to any desired point of deposit.

6. In a dredge, scow, or other mechanism adapted to carry away dredge material, the

combination of the following instrumental-
ities, viz: a hopper to receive dredge material,
a pump having its inlet below said hopper, a
conduit through which material is moved by
5 gravity from said hopper into said pump, and
a discharge-pipe, substantially as described.
In testimony whereof I have signed my

name to this specification in the presence of
two subscribing witnesses.

FREDERIC A. LOCKWOOD.

Witnesses:

GEO. W. GREGORY,
JAS. H. CHURCHILL.