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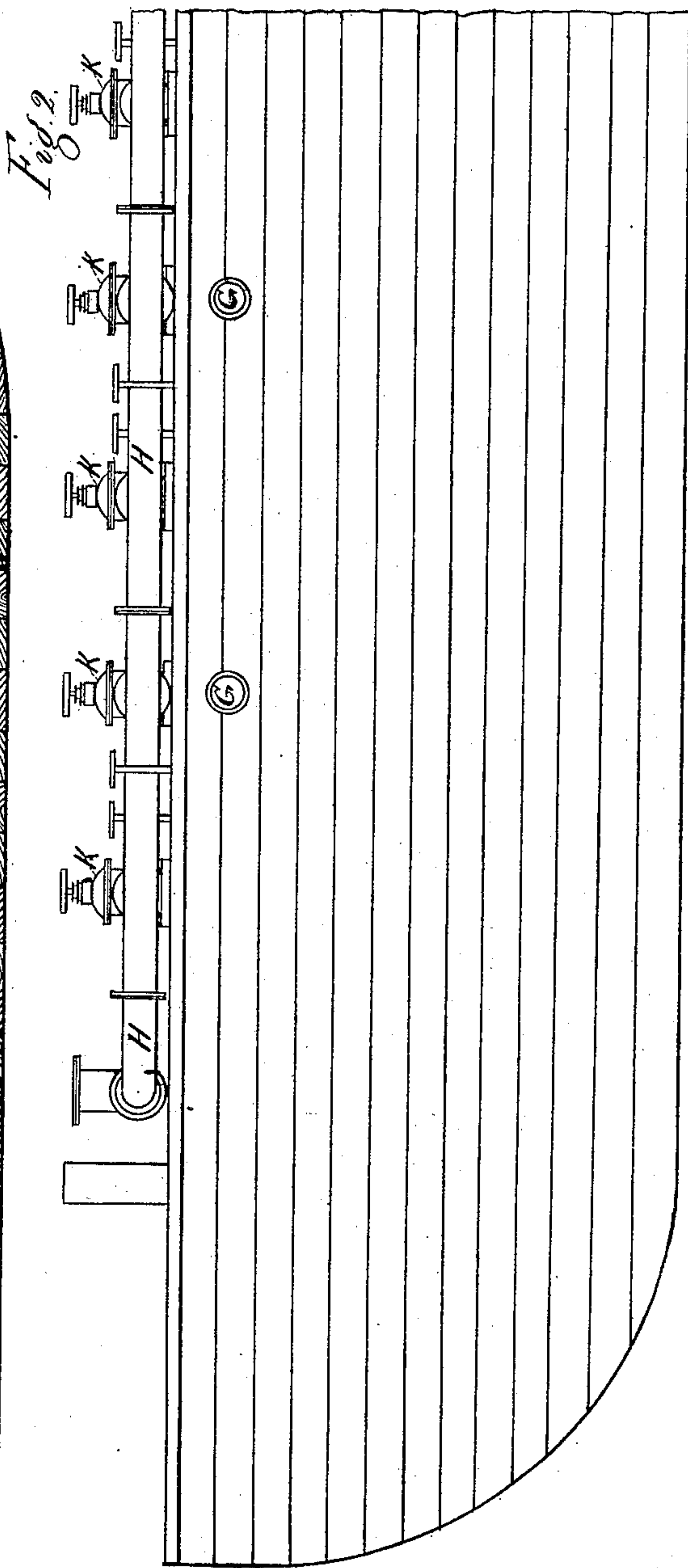
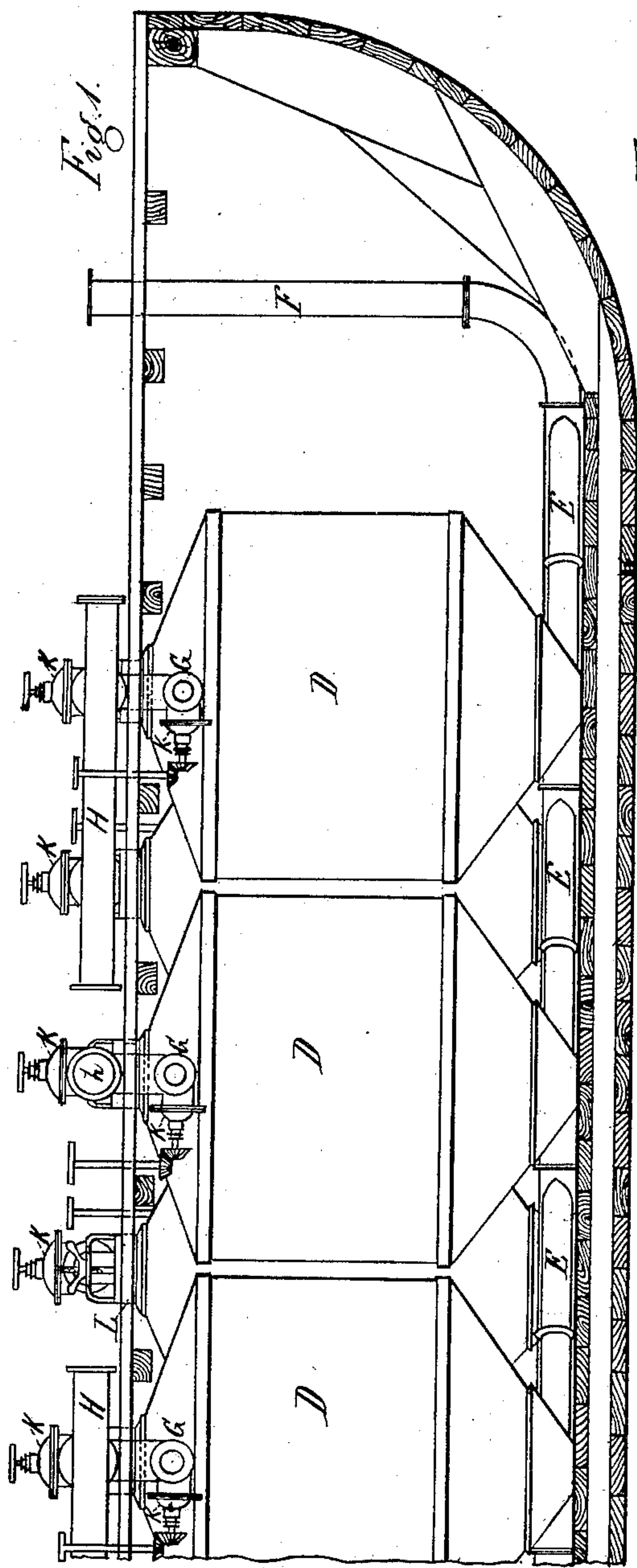
6 Sheets—Sheet 1.

W. A. PHILLIPS.

MUD CONVEYER.

No. 246,032.

Patented Aug. 23, 1881.



Attest:  
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William A. Phillips,  
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(No. Model.)

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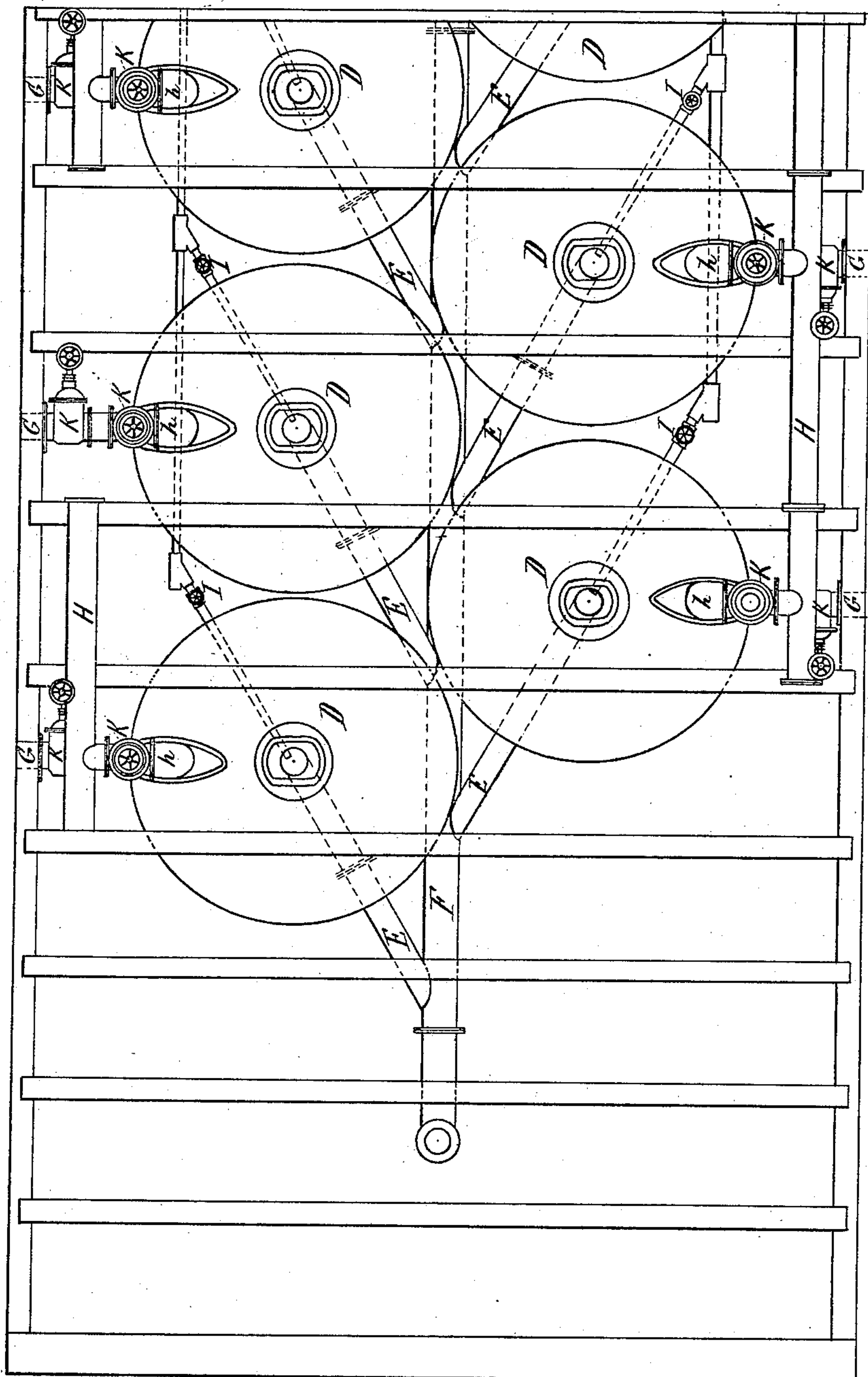
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Fig. 3.



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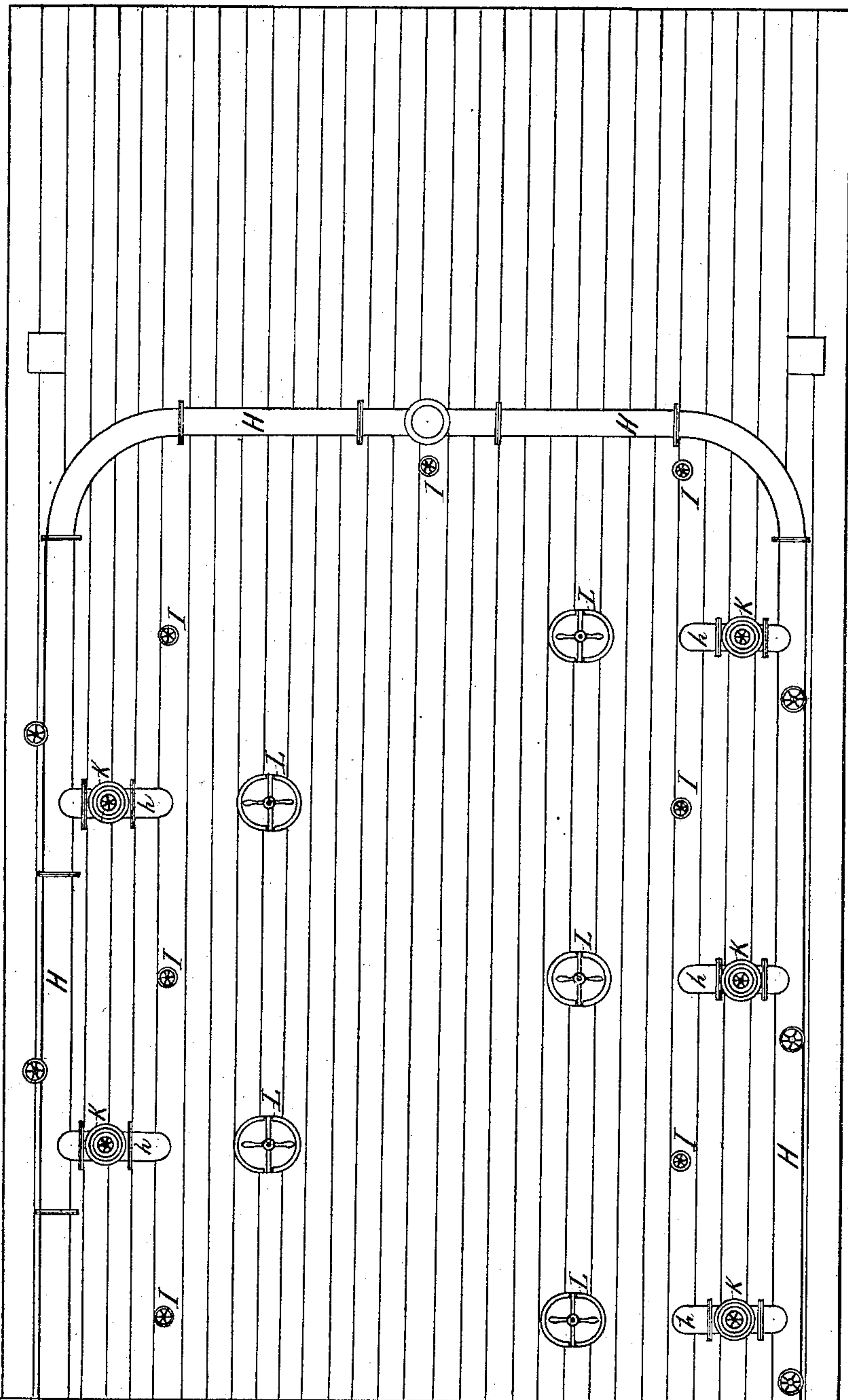
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Fig. 4.



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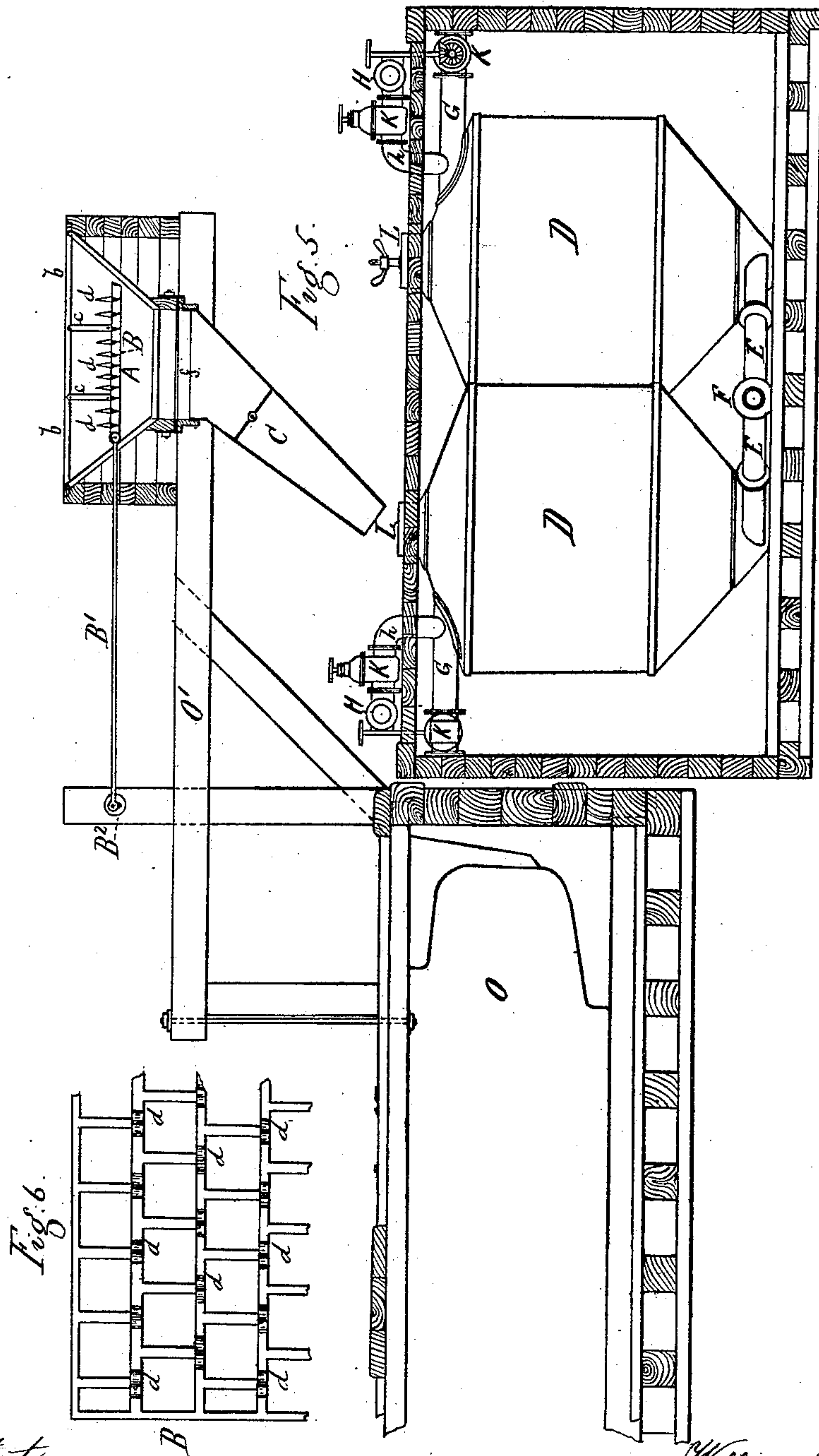
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W. A. PHILLIPS.  
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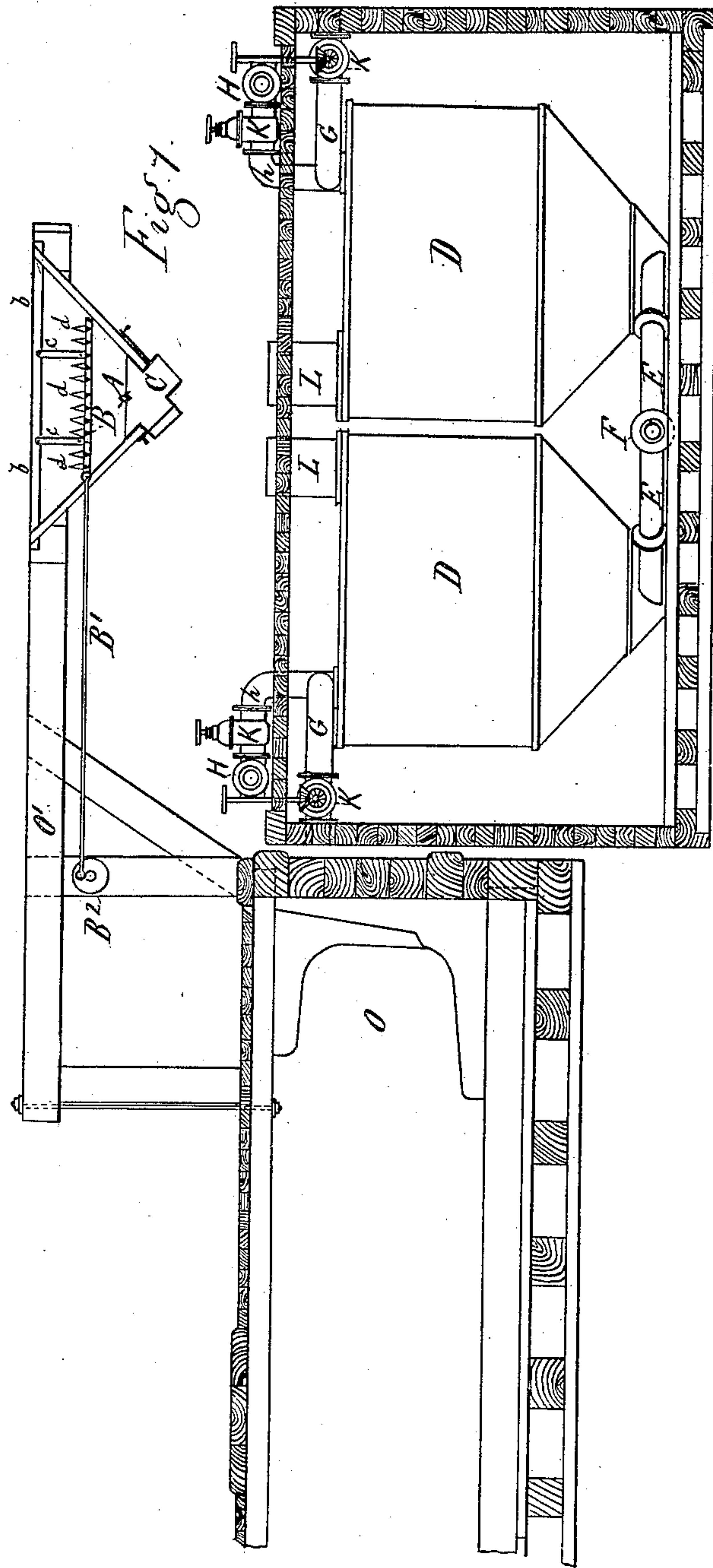
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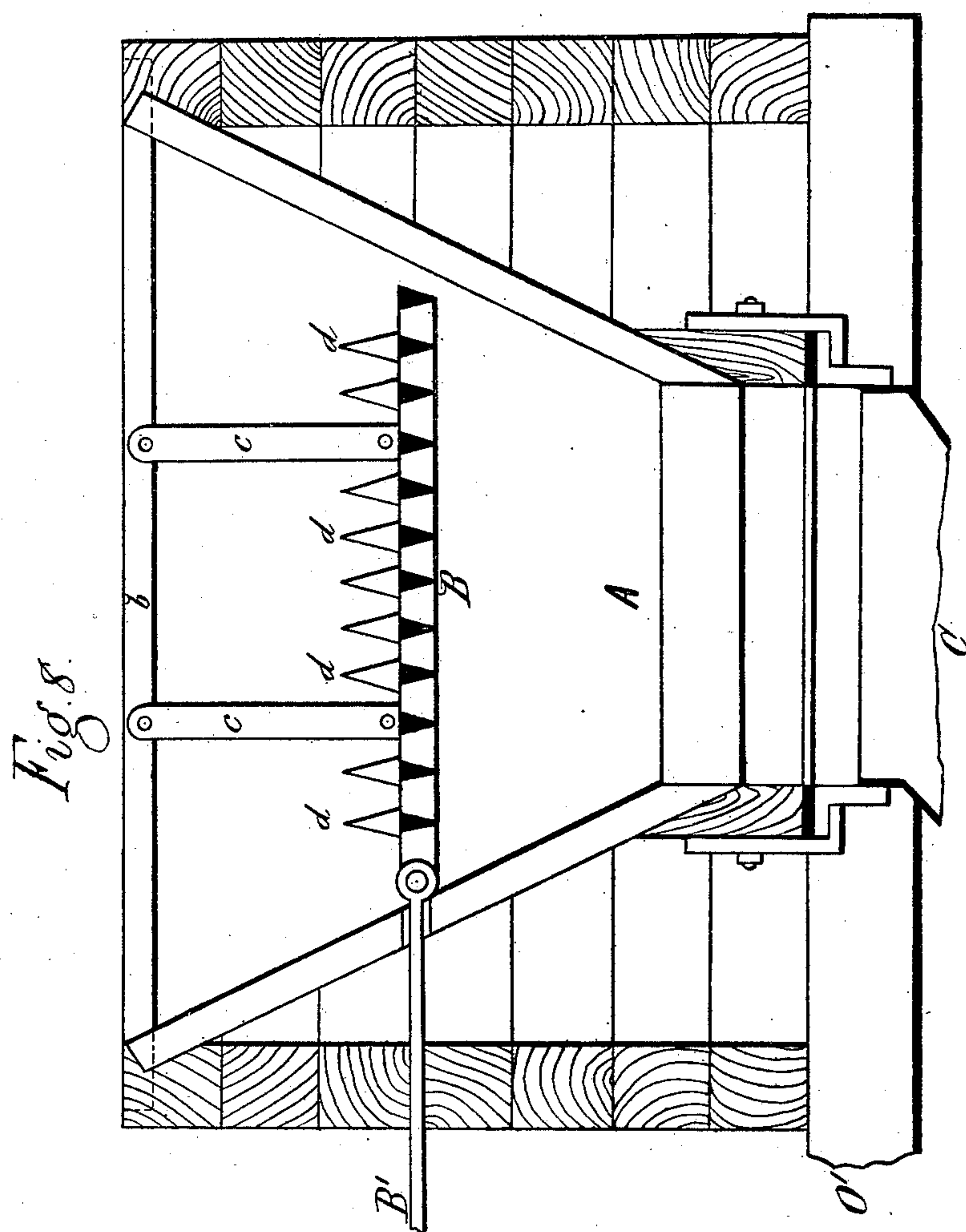
(No Model.)

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W. A. PHILLIPS.  
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# UNITED STATES PATENT OFFICE.

WILLIAM A. PHILLIPS, OF SAN FRANCISCO, CALIFORNIA.

## MUD-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 246,032, dated August 23, 1881.

Application filed June 16, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. PHILLIPS, of San Francisco, county of San Francisco, and State of California, have invented certain  
5 new and useful Improvements in Mud-Conveyers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 My invention has relation to apparatus or means especially designed to facilitate the carrying and discharging of mud or dredging of any character for the purpose of building levees on river banks, filling in lots, fertiliz-  
15 ing, or otherwise disposing of the material for useful purposes or for waste, as is sometimes required; and the object of my invention is to produce a simple, complete, efficient, and easily-operating apparatus, by means of which  
20 the loading may be quickly, easily, and properly performed, the load transported to any desired distance, and then discharged to advantage and with little expense for power, &c. To accomplish this the invention involves cer-  
25 tain novel and useful arrangements or combinations of parts, peculiarities of construction, and principles of operation, all of which will be first fully described herein, and then pointed out in the claims.

30 In the accompanying drawings, I have shown at Figure 1 an elevation of one half or one portion of a mud-conveyer constructed and arranged to be operated in accordance with my invention, the side of the vessel being removed  
35 to show the interior arrangement of tanks, &c., and at Fig. 2 an elevation of the remaining half or portion of the same vessel, the side remaining in place. Fig. 3 is a half-plan with the deck removed, and Fig. 4 is a half-plan with the deck in place. Fig. 5 is a section and partial  
40 elevation, showing one form of hopper connected with a dredger, and adapted to receive and operate upon the material to be loaded and to deliver the same to the tanks in the mud-  
45 conveyer. Fig. 6 is a plan view indicating, on an enlarged scale, the construction and arrangement of the cross-bars or gratings placed in the hopper. Fig. 7 is a section and partial  
50 elevation, showing another form of hopper connected with a dredger or excavator, and adapted to deliver the material to the tanks

in the mud-conveyer. Fig. 8 is a vertical section of a hopper similar to that shown in Fig. 5, but on an enlarged scale, so as to illustrate the inclined projections placed upon and be-  
55 neath the grate-bars.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

Since it is one purpose of my invention to 60 discharge the material from the tanks through pipes by means of water-pressure, as will hereinafter appear, it is obvious that the material should be broken up and freed from sticks, blocks, stones, and other matters likely to ob-  
65 struct its free movement before it is admitted to the tanks. To accomplish this I erect upon any convenient part of a dredge, excavator, or other structure, as O, any suitable frame or support, O', upon which I mount the hopper  
70 or vessel A, calculated to receive the material before it is delivered to the tanks D. This hopper A has inclined sides, as shown, or is substantially conical in shape, the better to re-  
75 ceive and discharge the material as required.

Within the hopper A, and covering its discharge end, I locate a toothed grating, B, upon which the material is to be dropped. This grating is composed of cross-bars suffi-  
80 cient to bind the whole firmly together, substantially as indicated at Fig. 6, and upon the bars of the grating are a convenient number of upwardly-projecting teeth, *d d*, to break up and disintegrate the material.

Across the open upper mouth of the hopper 85 A is the cross-bar or equivalent support *b*, from which the grating B is suspended by means of connecting-links, as at *c c*.

B' is a rod connecting the movable grating with any convenient crank-wheel, B<sup>2</sup>, and in-  
90 tended to be moved by suitable machinery or otherwise. The ribs of the cross-bars of the grating are inclined or tapering at bottom, so as to insure the free delivery of the material after it passes between the upper surfaces of  
95 the bars. The cross-bars will, when in motion, serve to break up any solidified mud which may be dropped upon them, and the whole grating will arrest any sticks, blocks, stones, or material of too bulky nature to be easily discharged  
100 from the tanks. It is intended to keep the grating in motion so long as material is being



dumped upon it, or so long as may be necessary, considering the character of the material.

At the bottom of the hopper is attached a spout or pipe, C, fitted to a circular ring, *f*, Fig. 5, which spout or pipe is set at an angle which will allow of free fall or slide of the mud to the tank below; and it is arranged so as to turn on or with said ring, in order that its discharge end may be conveniently directed as may be required for filling the tanks below. This arrangement avoids the necessity of using more than one hopper, no matter how many tanks or scows, &c., may be employed, since the scows are simply passed under the spout in order to be filled. The conveyer proper, which may be in the form of a scow or other suitable vessel intended to be floated from point to point, has fitted in it a number or series of tanks, D D, (any desired number,) and these tanks are connected with each other at bottom by means of branch pipes E, leading into a main discharge-pipe, F, conveniently located with respect to the tanks in the vessel.

At the tops of the tanks in the vessel are the overflow-pipes G G, intended to carry off the water displaced by the mud when the tanks are being filled. The pipes G discharge through the sides of the vessel, as plainly indicated. To these overflow-pipes are connected the branch induction-pipes *h h*, for the supply of the water-pressure hereinafter alluded to, and both the pipes G and *h* are fitted with suitable water gates or valves, K K, each tank being similarly supplied, so that one or more tanks may be discharged at one time.

Opposite the outlet from each tank, or opposite the mouths of the branch discharge-pipes E, are fitted small pipes, (shown at I I,) each having a suitable valve and a hose or similar nozzle. The use of these pipes and nozzles is to direct a stream of water toward or into the opening of pipes E, thus starting in motion sand or other heavy substances that may settle at the bottom of the tanks, and relieving the pressure that would otherwise be required to start the material in the line of discharge. The water and pressure for the pipes I are intended to be supplied by means of a small pump independent of the main supply-pump. The pressure on top of the mud forces it into the orifice of the discharge E, there to be reduced by the jet from pipe I to a semi-fluid condition, if necessary. The consistency can be regulated by use of the valves on the jet-pipes, and if the material is thin enough the jet can be shut off entirely.

The inlets L to each tank are of the usual man-hole pattern, and are fitted with rubber gaskets or otherwise, so that they may be made tight. The inlets being opened for the reception of material, it is directed into the tanks through the spout C, the tanks being previously full or partially filled with water, which prevents the material from lodging against the sides of the tank, and acts as a lubricator and

solvent to facilitate discharge. The tanks being loaded, the man-holes are closed, and the scow or vessel transported to the desired point for delivery.

The discharge end of pipe F (shown in vertical position at Fig. 1) being suitably connected with the landing-pipe, which latter may lead to any desired distance, and to the point where it is desired to have the material deposited, a hydraulic pressure is produced in each tank separately, or in two or more or all at one time, and the material in the tanks thus driven or forced out through pipes E and into F, and thence out to destination.

The hydraulic pressure necessary for accomplishing the discharging of the tanks is obtained by means of any suitable form of pump, arranged to force water into the tanks through the pipe H and its connections. This pump may be most advantageously operated by steam, and it may be mounted, together with its boiler, upon the conveyer or upon a separate vessel, to be moved only as the place of discharging or unloading is changed. There being nothing peculiar about the pump or boiler, and both being well understood, it has not been deemed necessary to illustrate them herein. The incoming water displaces the mud, &c., in the tanks, as will be readily understood. This water used for displacement is generally allowed to remain in the tanks until they are being refilled, when it is displaced wholly or in part through the overflow-pipes G, as previously explained. When the tanks are disposed as in the plan Fig. 3 the long spout C (shown in Fig. 6) will serve to discharge material into three of them (by turning the spout) before it will be necessary to shift the scow or conveyer in order to bring other tanks within range of the spout; but instead of being arranged as in Fig. 3 the tanks may be placed side by side, and in that case a spout like that indicated in Fig. 7 may be employed, which will serve to load two tanks at one time, or without changing the position of the conveyer.

Suitable gates may be placed in either form of spout, as plainly shown, for the purpose of regulating the discharge therefrom.

The bottoms of the tanks are inclined toward their outlet-orifices, to better insure the settling of the mud, &c., into these outlets, and to facilitate discharge. The tops of the tanks may also be made conical or inclined, as shown at Figs. 1 and 5.

If it be desired to reduce the height to which it is necessary to elevate the dredged material, then flat-topped tanks may be employed, as indicated in Fig. 7. The conical tops, however, are best adapted for withstanding the interior pressure, and are easier and handier to make.

It will be observed that the outlet-branches E are inclined toward the axis of the main discharge-pipe F, thus avoiding abrupt turns in the outlet, which would be harder for the



material to pass; and it will also be observed that there are no valves in the outlet pipes or branches.

Each tank being filled, and the outlet through F being free, it is plain that the pressure of material in any tank will be sufficient to prevent entrance therein of material from any other tank, and that one or more tanks may be discharged without interfering with the others in any way; but if desired for any reason or purpose any suitable valves or gates may be placed in pipes E or F.

The tanks being filled with the material to be discharged, and the proper connections made with the pump and the landing-pipe, the jet at bottom should be first opened, after which the main hydraulic pressure is introduced on top. The pump should be timed so that it will throw into the tank the requisite number of gallons to displace the mud, and it may then be made to communicate with another tank, and so on with the whole or until all are unloaded.

The object of mounting the tanks upon a scow or floating vessel is convenience of transportation and facility of obtaining water; but the same system might be applied upon cars, of suitable form, in situations where they could be worked to advantage.

The valves, &c., are all operable from the exterior of the tanks, and their stems or handles are conveniently arranged, so as to be accessible from the deck of the scow or vessel.

There is no machinery about the system to get out of order, and particularly none to be interfered with or to become clogged up by the material designed to be transported.

The convenience, completeness, and durability of the improved apparatus are features which will recommend it for adoption in locations where dredgings, &c., are required to be landed or delivered at particular points.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with a dredging-scow and receiving-tanks, the herein-described movable grating, located in the hopper which receives material from the dredger, the same being adapted to break up the clods of mud, and to separate sticks, blocks, or stones therefrom before delivering it to the tanks, substantially as shown and described.

2. The hopper suspended from or supported by the dredger, and provided with a spout for delivering material to the tanks below, and having, also, a movable grating mounted therein, and adapted to be operated substantially as shown and described.

3. The movable grating B, composed of bars and connecting-ribs, as shown, the lower edges of the ribs being inclined or sharpened to fa-

cilitate delivery of material, and the upper surface being provided with projecting teeth *d d*, substantially as shown and described.

4. The hopper A, suspended from or supported by the dredger O, the same being provided with a spout, C, and with a grating, B, having teeth *d d*, said grating being suspended from cross-bar *b* by links *c c*, and operated by bar B' and wheel B<sup>2</sup>, the whole being combined and arranged to operate substantially as shown and described.

5. In a mud-conveyer of the character herein set forth, the series of tanks mounted in or on a scow or other vessel, each tank being provided with a man-hole at top and with inclined bottoms, and each provided with a branch pipe, E, leading from the bottom into the main discharge-pipe F, substantially as shown and described.

6. In a mud-conveyer, the series of tanks D, having branch pipes E leading into the main discharge-pipe F, said branch pipes being inclined toward the axis of pipe F, substantially as and for the purposes set forth.

7. The overflow-pipes G, communicating with the tanks D, and provided with suitable valves, said overflow-pipes being arranged to discharge water from the tanks as the latter are being filled, substantially as and for the purposes set forth.

8. In combination with the series of tanks provided with overflow-pipes, the main water-inlet pipes H, for introducing water to force the mud out through pipes E and F, the whole arranged to operate substantially as shown and described.

9. The jet-pipes I, arranged to deliver a stream of water in the direction of the outlets from the bottoms of the tanks, for the purpose of facilitating the discharge of mud, substantially as shown and described.

10. The method herein described of loading and discharging the conveyer—that is to say, first dropping the material after freeing it from blocks, stones, &c., into tanks, discharging the material from the tanks by forcing water into them above the material, and then displacing the said water by the introduction of the next load—substantially as described.

11. The herein-described mud-conveyer, composed of the tanks D, having outlet-pipes E communicating with main discharge-pipe F, the jet-pipes I, overflow-pipes G, water-inlet pipes H, and man-holes L, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

WILLIAM A. PHILLIPS.

Witnesses:

PETER MACKIE,  
H. B. COUSINS.