

W. ATKINSON.  
APPARATUS FOR SEWERAGE, &c.

No. 38,544.

Patented May 19, 1863.

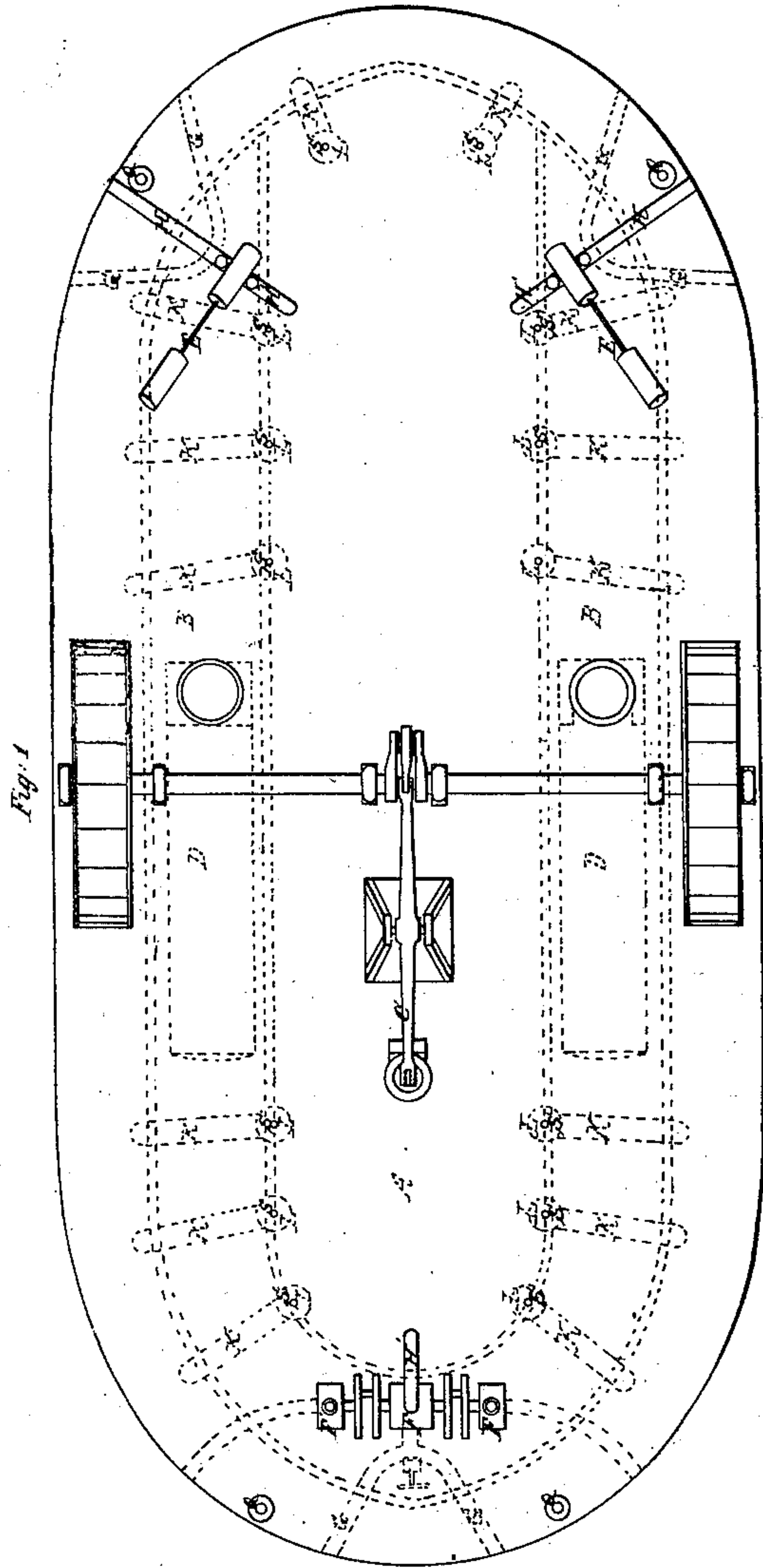


Fig. 1

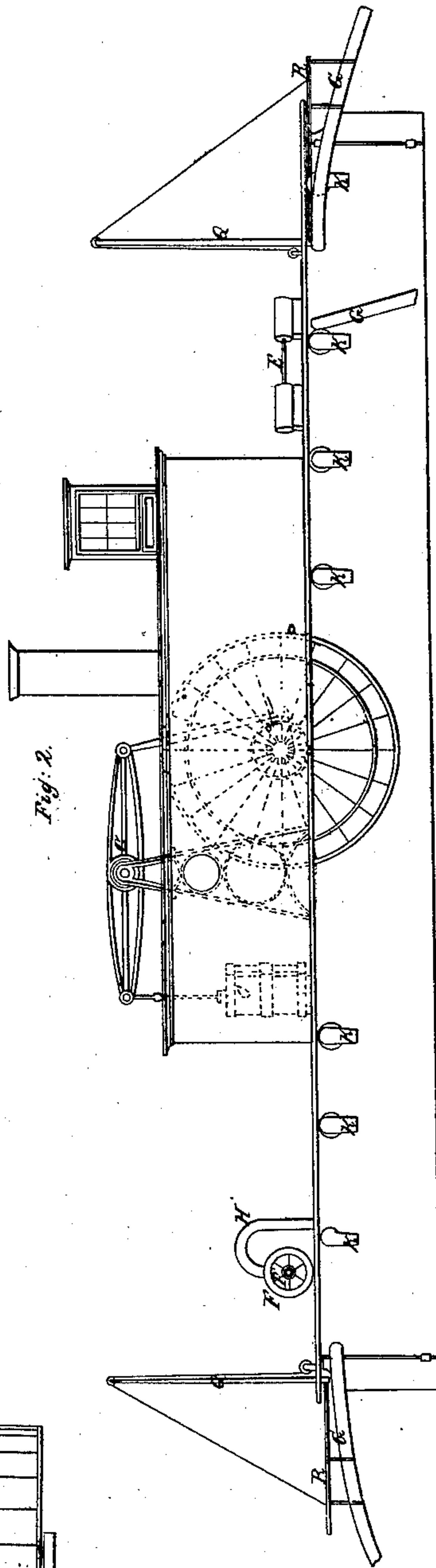


Fig. 2

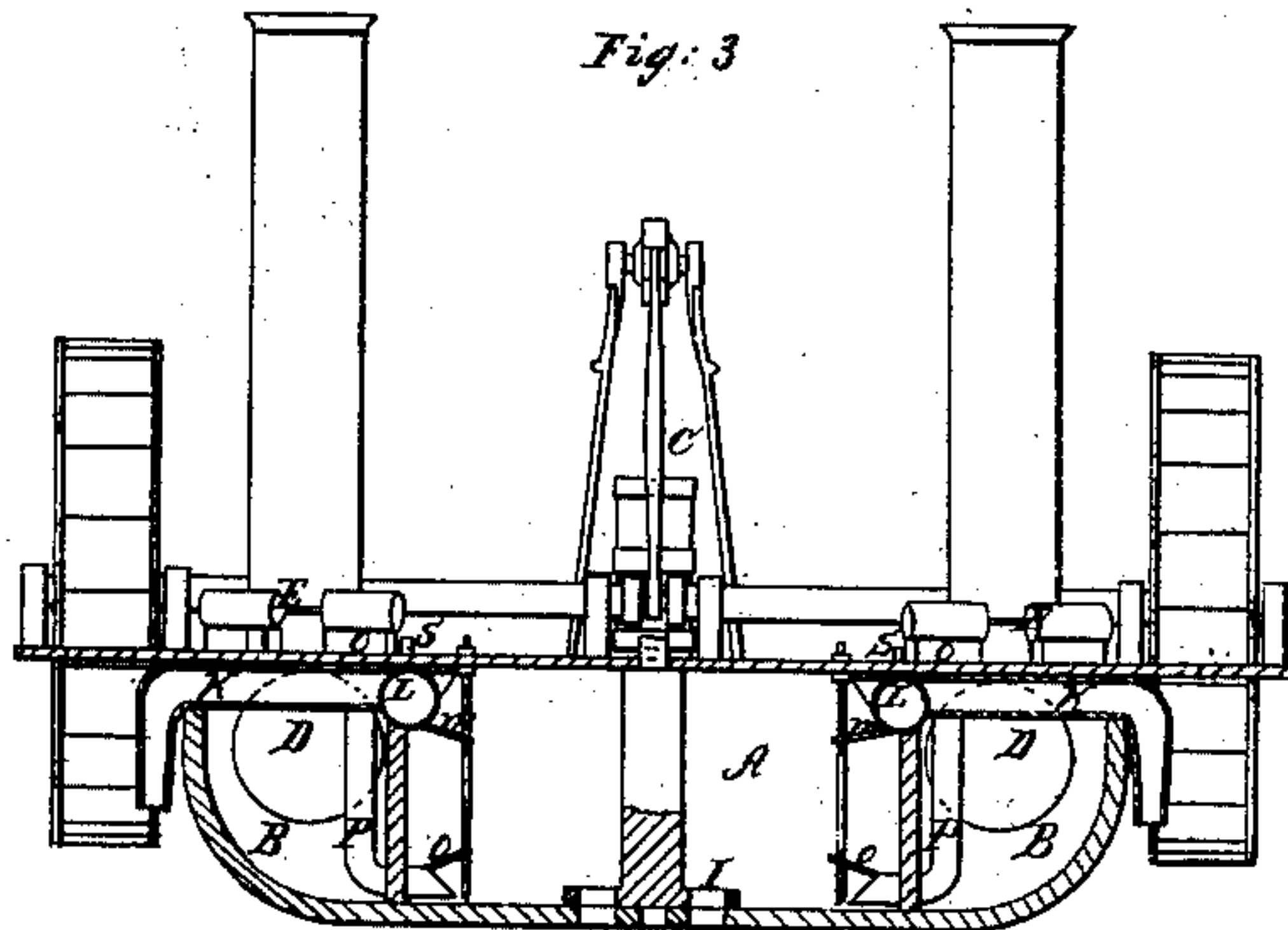


Fig. 3

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN APPARATUS FOR SEWERAGE.

Specification forming part of Letters Patent No. 38,544, dated May 19, 1863; antedated October 26, 1862.

*To all whom it may concern:*

Be it known that I, WILLIAM ATKINSON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful apparatus for collecting, carrying away, and depositing in a suitable place the sedimentary matter which passes out from sewers at any grade, the deposits formed in docks, harbors, rivers, bays, or on bars, or the solid matters that may be held in the waters thereof; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of the apparatus. Fig. 2 is a side view of the same. Fig. 3 is a transverse section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This apparatus, which I denominate the "floating sanitary sewerage-receptacle and suction dredging-boat," consists of a floating vessel capable of being propelled by steam-power or by other means, having within it one or more deposit-compartments, whose capacity is a very considerable proportion of that of the whole vessel, (provision being made for buoyancy,) for the reception of sewerage deposits or of muddy or other deposits obtained from the bottoms of docks, harbors, rivers, bays, or other waters, or from bars, or from a stationary collecting-reservoir or reservoirs which may be arranged at the outlet of a sewer, and in which a partial filtration may be effected to obtain the deposits in a more condensed form, or for the collection of solid matters that may be suspended in such waters while in an agitated condition, such vessel being fitted with pumps or their equivalents, and furnished with suitable suction, delivery, and discharge pipes for taking up the said deposits or solid matters with more or less water and delivering them into the before-mentioned compartment or compartments of the vessel in which the said deposits or solid matters are retained, while the water is nearly all expelled through filters fitted to the vessel, the deposits or solid matters so collected being intended to be conveyed away by the vessel to be discharged, where it cannot be returned by the reflux or change of tide or current.

The principal object of the invention is the removal of deposits which have been or are delivered from sewers at their outlets; but it may be used generally for the removal of heavy deposits from the bottoms of docks, rivers, bays, harbors, and other waters, or the solid or decomposing matters that may be suspended in the waters thereof, and also of the sunken or floating decomposing or putrefying organic matter formed in rivers, streams, or other waters, and thereby serves not only to prevent the contamination of the atmosphere, but to prevent in a great measure the formation of mud banks and deposits which require to be removed by digging and the filling up of docks and under piers, and thus to prevent injury to harbors.

To enable others to construct and use my apparatus, I will proceed to describe its construction and operation.

The hull of the vessel may be specially constructed for the purpose, or the hull of a vessel of suitable form and capacity may be obtained and converted to the purpose. The deposit compartment or compartments A A, for the reception of the sedimentary deposits or solid matters, may be constructed and arranged in the middle of the hull, with buoyant compartments B B at the sides of or around them. The buoyant compartments B B may contain the boilers D D for the generation of the steam to drive the propelling-engine C and to operate the pumps, or the boilers may be arranged on deck. The propelling or pumping engine or engines may be arranged on deck or in the compartments B B. The pumps E E F and F' F' may also be arranged on deck, as represented, or below the deck and below the water-line, so as to be always charged. The pumps may be either of the reciprocating or rotary kind, or of both kinds, and may be driven by the same engine as is used for propulsion, or may be what are known as "steam-pumps," but, generally speaking, I prefer to use rotary pumps, as obstacles in the suction pipes of such pumps may be removed by reversing their motion.

E E represent steam-pumps, and F F' F' rotary pumps, to be driven by the propelling-engine, having connected with them pipes G G H H H' H' and P P G G and H H may be used as suction-pipes in taking the deposits



or muddy water into the deposit-compartments A A, or as discharge-pipes in emptying the compartments of mud or other solid or nearly solid matter, their action being changed by reversing the direction of the rotation of the pumps in the case of the rotary pumps, or by a suitable system of connections and valves or gates in the case of reciprocating pumps. These pipes G G H H may be made with flexible joints, to enable them to be directed to the point from which it is desirable to take the deposits or muddy water, when used as suction-pipes, such direction being effected by light derricks Q R or their equivalents. The pipes H' H' are delivery-pipes, through which the deposits or muddy water is delivered by the pumps into the compartments A A. The pipes P P are suction-pipes for discharging the mud or other nearly solid matter from the compartments A A. These pipes are to be closed by valves or gates o o at all times but when discharging the compartments A A, or when discharging the said compartments by other means to be presently described.

K K are discharge-pipes leading overboard from the compartments A A for the purpose of discharging water from the said compartments while the deposits and solid matters are being collected therein, such pipes communicating with the said compartments near the top thereof, and being fitted with filters L L, which constitute one of the essential elements of my invention, their object being to retain the deposits or solid matters in the said compartments, while the water is being forced through the said filters and pipes by the overflow consequent upon the said compartments being filled to a higher level than the water outside, aided by the pressure produced in the said compartments by the pumps, the said compartments being made air-tight, or nearly so, at the top by means of the covering-deck of the vessel. The pipes K K may be continued downward outside of the vessel nearly to the level of the surrounding water, or their outer orifices may be flushed with the exterior of the vessel, or other forms of discharge-passages from the filters may be adopted. The filters may be of any suitable construction varying according to the character of the deposits pumped into the reservoir. For instance, floating or decomposing matter requiring a filtering material of a different character from that required by dense and heavy deposits, and requiring a filter of different form and construction, and when the matters taken into the compartments contain a larger proportion of water the filters must be of larger size or have larger outlets. The filtering material may be sponge, granulated mineral matter, or coarse fibrous material, but provision should be made for cleaning the filters from time to time or for rendering them self-cleaning, as by reversing their position to cause the direction of the flow of water through them to be reversed; and they may be provided with means of adjustment as the nature of the process and state

of the sewerage and deposit matter may require, for instance to open the fiber of the filtering material or loosen the same, and thereby to clear it or to allow of a freer passage of the watery portions of the sewerage matter as it becomes denser in the reservoir.

S S in Figs. 1 and 3 are spindles for turning the filters to enable their position to be reversed.

m m are valves fitted to the inner ends of the pipes K K, for the purpose of closing the said pipes while the filters are taken out through suitable openings to be cleaned or repaired, or to have the filtering material changed when necessary.

Scuttles or large rotary-disk valves I may be provided in the bottoms of the compartments A A for letting out the deposits or nearly solid matters which have been collected therein, such scuttles or valves to be opened by any suitable mechanism provided on deck.

The operation of the apparatus is as follows: It is propelled to the place from whence the deposits or solid matters are to be collected, the valves m m are opened, and those o o are closed, and the pipes G G and H H having been properly directed, the pumps are set in operation, the direction in which the pumps are worked being such as to make the said pipes serve as suction-pipes in the case of rotary pumps; or the connections of the said pipes having been first properly adjusted for the purpose as hereinbefore specified in the case of reciprocating pumps. The deposits, with more or less water, or the muddy water, is then pumped into the compartments A A through the pipes H' H', and when the said compartments become full the water pumped in passes off through the filters L L and pipes K K, and the said compartments become gradually filled up with deposits or solid matters. In case of the deposits having accumulated in their bed in so compact a form as to be very difficult of removal by suction, one or more of the pumps may be used to force a powerful current or currents of water into, among, and under them to soften them and bring them to a suitable condition by that means. When the contents of the compartments have become sufficiently dense or concentrated, the operation of the pumps is stopped, and the said contents may be discharged into other vessels to be carried away, or upon land or places provided for their reception, and used or prepared for agricultural purposes, (when the deposits are found valuable,) or the said contents may be discharged and used for filling up low lands or lots, or carried off by the vessel itself and discharged into deep water beyond the action of the reflux of the tides or of return currents, such discharge being effected either by the action of the pumps or by opening the scuttles or valves I. If the pumps are used for this purpose, the valves o o are opened, and those m m are closed. The pipes H' H' are also closed by suitable gates or



valves, and in the case of reciprocating pumps the connections of the pipes G G and H H are so adjusted as to make the said pipes discharge-pipes before setting the said pumps in operation; or, in the case of rotary pumps being used, they are set in operation in a direction to make G G and H H discharge-pipes. On the pumps being set in operation the contents of the compartments A A are pumped out. In discharging by the pumps, or after having discharged as completely as possible by means of the scuttles or valves I, one or more of the pumps may have the connections of its pipes so arranged, or have such direction given to its rotation, that it may force clean water from outside the vessel into the compartments A A to loosen or stir up the solid matters or any remaining portion of them to enable the said matters to be discharged, that the compartments may be made as clean as possible before the apparatus returns for a fresh load.

Instead of the apparatus being self-propelling or propelled by power on board, it may be towed to the places of filling up and discharge; but I prefer to have it propelled by steam-power on board.

When the vessel is in position for filling its compartment or compartments A A, it may be held in place by anchors or by dropping into the mud or on to the bottom or led below the water, a cylinder furnished on its periphery with teeth or cutters and attached to the vessel at the head or stern or such other part as may be desirable, said cylinder being so com-

bined with the engine on board the vessel that it may have rotary motion given to it for the purpose of stirring, cutting up, or loosening the bottom bed or deposits when of a hard or compact character, to bring them to a condition to be taken up by the suction-pipes.

I do not claim, broadly, the removal of deposits of solid matter from the bottoms or beds of docks, rivers, bays, harbors, or other waters by suction, but, without confining myself to the precise details herein described,

What I claim as my invention, and desire to secure by Letters Patent, is—

An apparatus whose principal elements consist of a floating vessel having one or more compartments or any portion of its interior constructed and arranged for the reception of such deposits, or of muddy water, or water containing solid matters, a pump or pumps and pipes or other equivalent means of delivering the such deposits or water into said compartments or space, one or more filters or strainers to provide for the escape of water from said vessel, and the retention of the deposits or solid matters therein, and suitable means of discharging the deposits or solid matters, the whole combined to operate substantially as and for the purpose herein specified.

WILLIAM ATKINSON.

Witnesses.

CROSSMAN LYONS,  
GEORGE STOWE.