(No Model.) 3 Sheets—Sheet 1.

J. C. McGOWAN.

SEWERAGE SYSTEM.

No. 448,988. Patented Mar. 24, 1891.

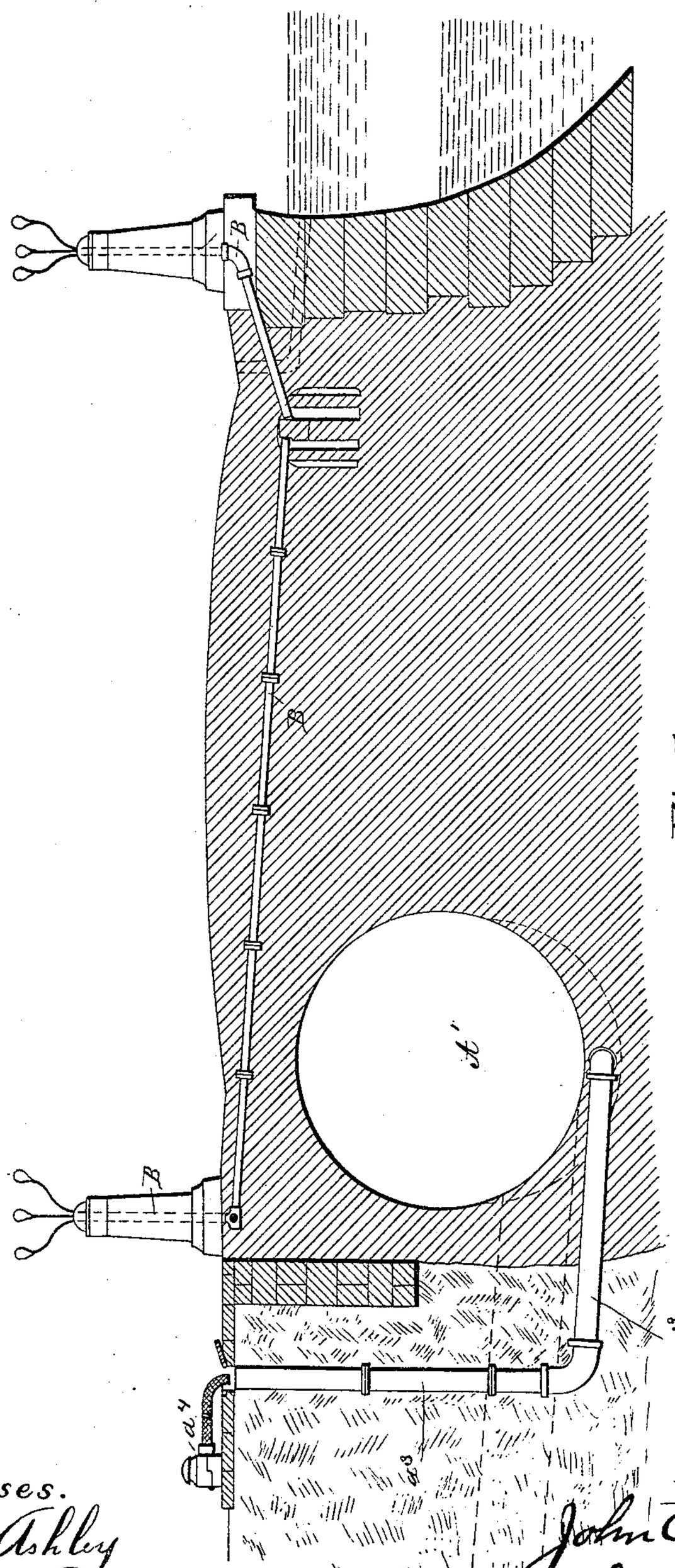

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

J. C. McGOWAN.

SEWERAGE SYSTEM.

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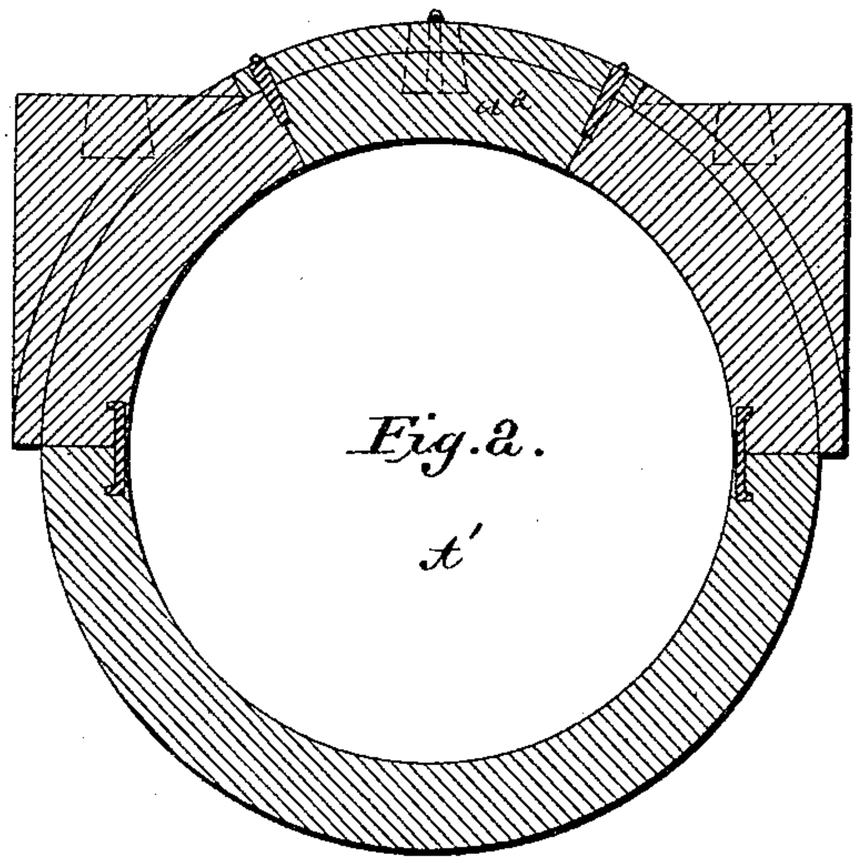


Fig. 2.

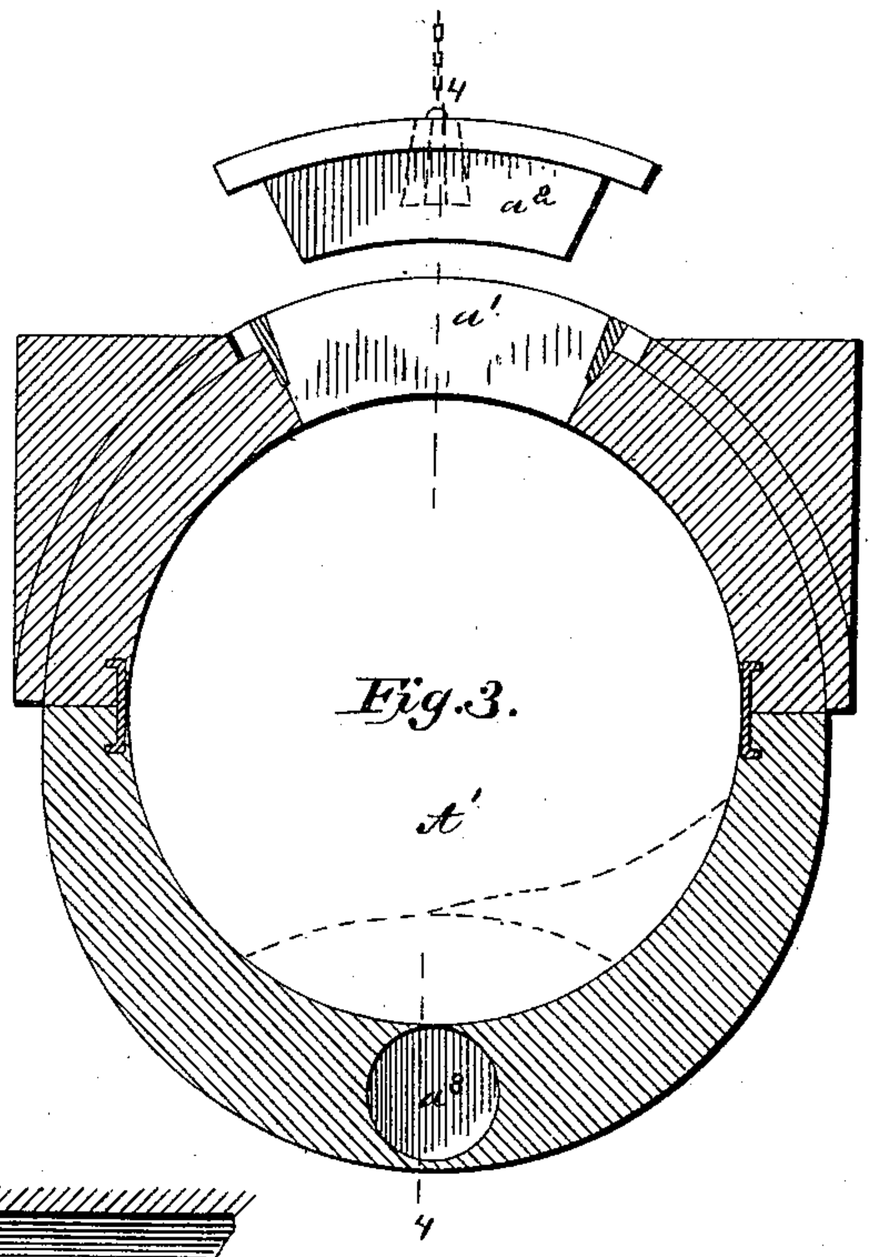


Fig. 3.

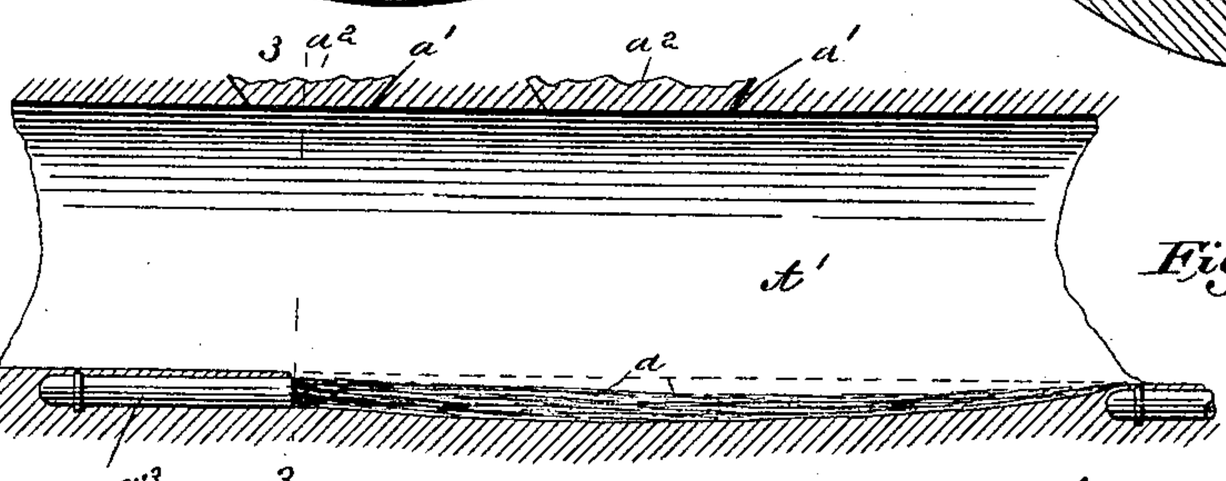


Fig. 4.

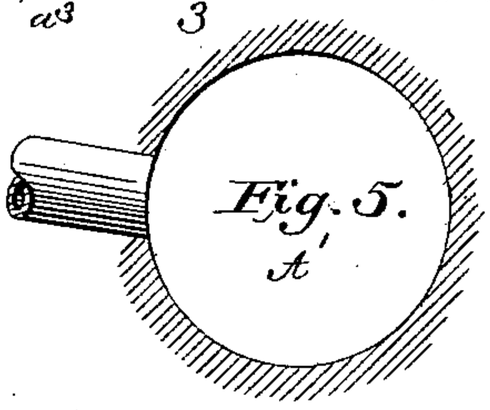


Fig. 5.

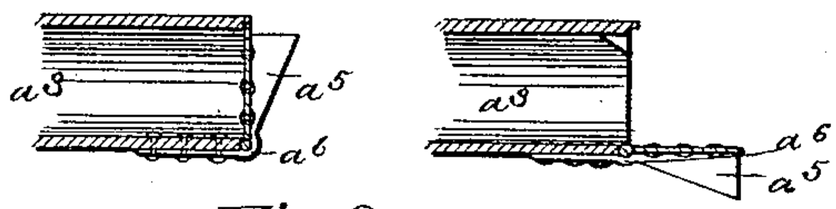
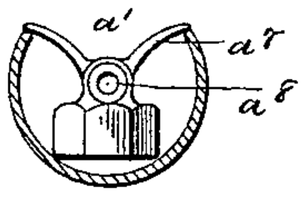


Fig. 6.

Fig. 7.



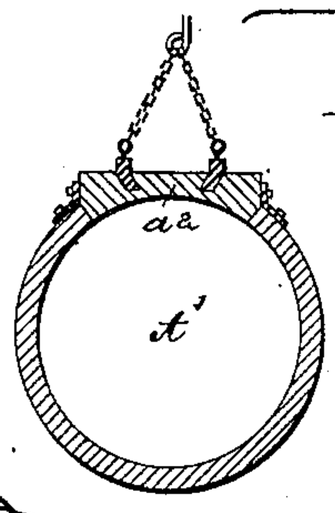
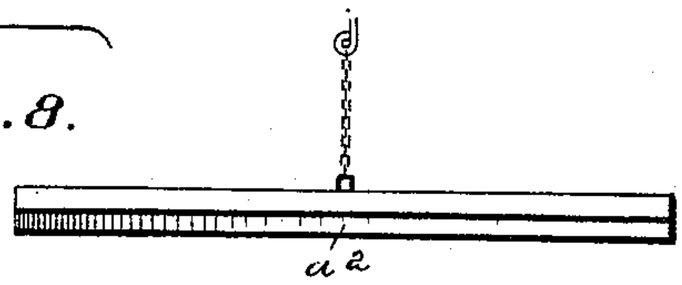


Fig. 8.



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(No Model.) 3 Sheets—Sheet 3.

J. C. McGOWAN.

SEWERAGE SYSTEM.

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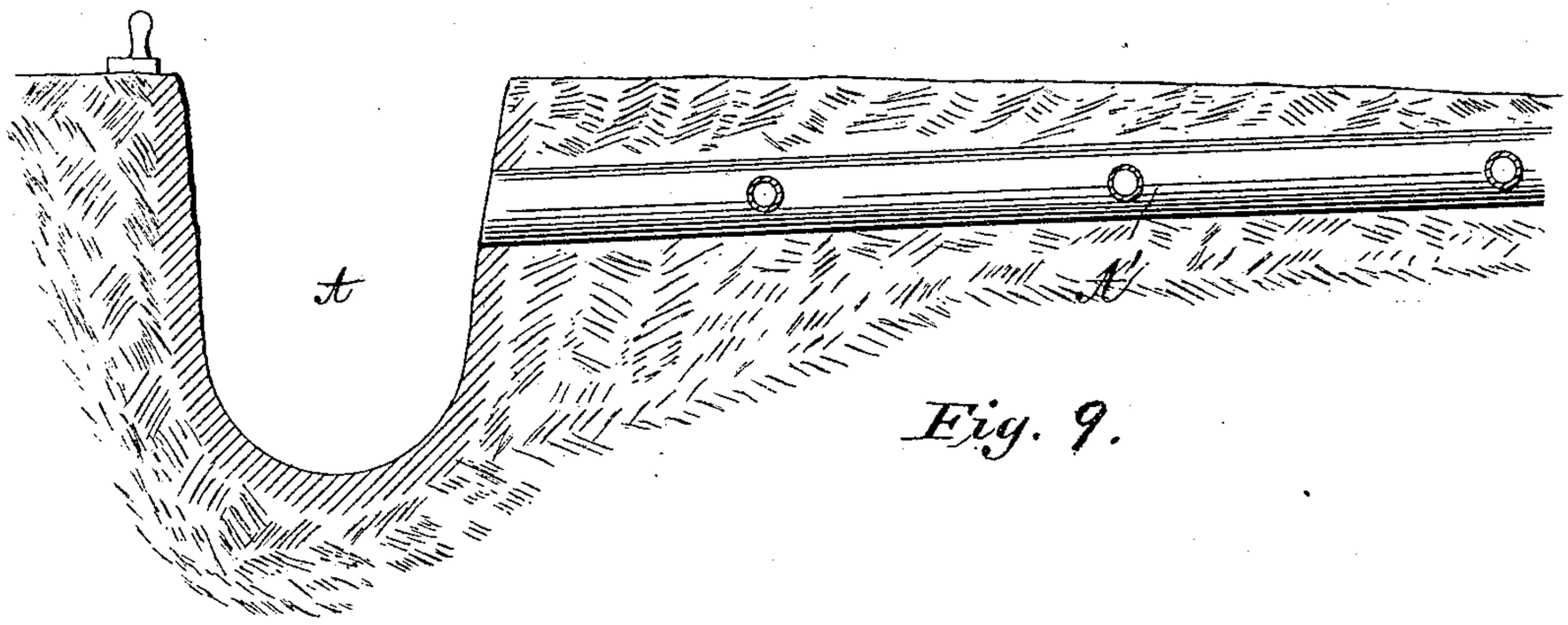
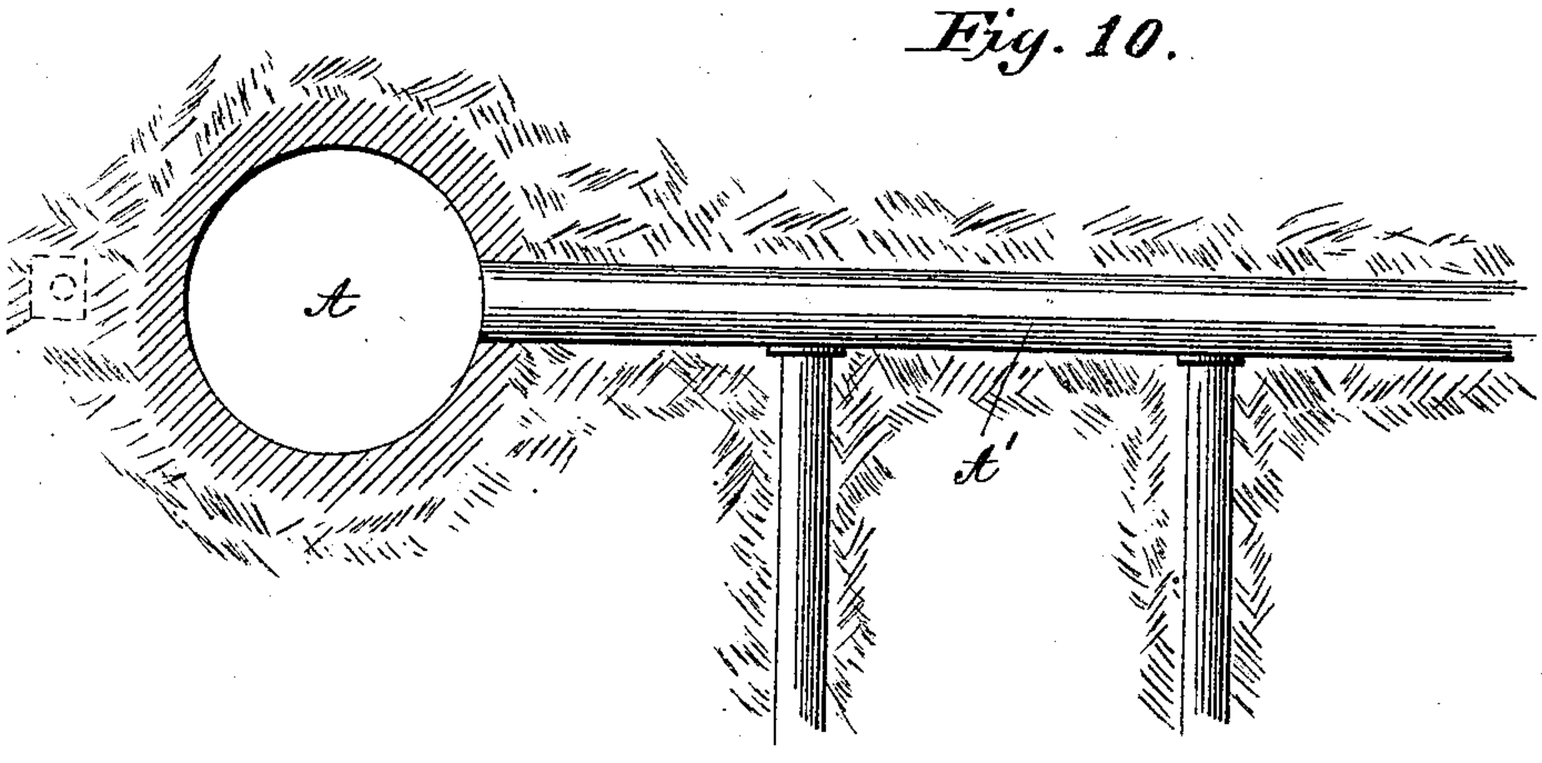


Fig. 9.

Fig. 10.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN C. McGOWAN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO W. D. COLT, OF SAME PLACE.

SEWERAGE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 448,988, dated March 24, 1891.

Application filed February 11, 1890. Serial No. 339,988. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. McGOWAN, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Systems of Sewerage; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a system of sewers for draining low ground, and especially to that class of sewers which are for various reasons incapable of carrying off the water at certain times.

My invention is more particularly designed for that class of cities and towns which are the subject of occasional or frequent flooding of a part or parts of their territory. These floods are due to many causes—choking of the sewers due to insufficient fall, cross or intercepting sewers emptying into sewers of little greater capacity than themselves, sewers emptying into tidal waters below the high-tide mark, and the backing of water into sewers from neighboring streams or bodies of water due to unusually high tides, the wind, and floods or freshets.

The object of my invention is to provide a system of sewerage which will remedy all of these defects; and to that end the nature of the invention consists of constructions and combinations, all as will hereinafter be described in the specification and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 represents a transverse section of a sea-wall having a conduit and subway; Fig. 2, a section of a sewer; Fig. 3, a section of a sewer on line 3 3, Fig. 4; Fig. 4, a longitudinal section on line 4 4, Fig. 3; Fig. 5, a section of the conduit, showing the preferred manner of connecting the lateral sewers with the same; Fig. 6, details showing the valve at the end of the flushing-pipe; Fig. 7, a modification of the flushing apparatus applied to an iron or terra-cotta sewer; Fig. 8, details showing the manner of closing the opening for the flushing device in an iron or terra-cotta sewer; Fig. 9, a section showing the relative position of the reservoir, the conduit, and the mains; Fig. 10, a plan view of the matter shown in Fig. 9.

The manner of connecting the system depends entirely upon the topography of the country to be drained. There may be one or more reservoirs placed at any desired point or points with conduits extending therefrom to any desired point or points, as the character of the surface to be drained may require or the location of the ground-sewers already formed may need.

As it will be impossible to show up any particular locality to be drained within the limits of an ordinary drawing, the drawings in this case merely exhibit the broad idea of the invention and such details as are generally applicable to the system.

A represents a reservoir the bottom of which is considerably lower than the lowest part of the land to be drained. In many localities it may be placed at the lowest part of the ground to be drained, so that the conduits from the higher points may lead to the reservoir with sufficient fall to carry off the water without changing the sewers already in use. In cases, however, where there may be several low places to be drained the conduit must be constructed in such manner that it will be below all the low points and on such an incline that the water will run easily to the reservoir.

In the drawings a conduit A′ is shown running from a point higher than the bottom of the reservoir, the depth of which is controlled by the nature of the ground to be drained. The capacity of this conduit must be greater than the capacity of all the sewers emptying into it, so that backing of the water in the sewers will be obviated. It is necessary in a system of this kind to have a fall sufficient to take off the water. The nature of the ground, however, sometimes prohibits the use of a fall that will take off to any great extent the solid matter in the sewage, as an increase in the fall sufficient to accomplish that result would necessitate placing the outfall very near the bottom of the reservoir, or making the latter of a great depth, which would be very expensive to make and necessitate lifting the sewage to a great height before passing it into the place of final outflow. To remedy this a series of depressions or catch-basins *a* are formed in the sewers at short intervals, which serve as vats for the solid matter, which rests therein until the sewer is flushed artificially,

as will hereinafter be described. This flushing prevents the choking of the sewers and the consequent accumulation of filth, creating unsanitary conditions, which is one of the greatest evils that engineers have to contend with. The same evils exist to a great extent in cities that have land which is difficult to drain because it is below the high-water mark.

In the wall of the sewer, above the catch-basins, man-holes a', having curves a^2, are placed, so that the sewers and conduits may be entered, if desired, for the purpose of cleaning the sewer; but, as the removal of sewage in the heart of a city is objectionable in a sanitary sense, I prefer to wash all the accumulations of the catch-basins into the reservoir, where they can be removed without endangering the health of a city, and be made into fertilizer at a profit.

Any suitable flushing device may be used. The flushing device, however, must be independent of the water of the sewer, as that water would have to be dammed up before sufficient volume could be had to flush a basin. Such a construction would also interfere with the natural flow through the sewer. To obviate that, the flushing device is separate from the sewer and is supplied with water that has not entered the sewer at all. My preferred form consists of a pipe a^3, embedded in the bottom of the sewer or conduit, with the exit end pointing toward the outlet of the sewer or conduit and terminating at the head of the catch-basin and the other end connected with a suitable water-supply a^4 at or near the surface of the ground. The pipe a^3 is located at the upper head or end of the catch-basin adjacent to the floor or bottom of the same, so as to form a jet or flush pipe for removing the sediment from the head to the outlet end of the catch-basin in a direction toward the mouth of the sewer, the water from the jet-pipe flowing or impinging against the bottom or floor of the catch-basin, effectually cleansing the same. The outlet end of the pipe a^3 may be provided with a hinged valve a^5, which is held in place by a spring a^6, secured to the under side of the pipe and bent to contact with the valves a^5, as shown in Fig. 6. This spring is of such tension as to hold the valve in place until a certain pressure is reached, when it permits the valve to fall and allow the water in the pipe to gush forth into the catch-basin and force the contents of the latter into the next basin, and so on until the reservoir is reached, and into which it is forced and removed at proper intervals.

To prevent the low lands from being flooded by the water backing into the sewers because of high tide, freshets, or floods, a sea-wall of sufficient height to be above the high-tide or freshet mark is interposed between the place to be drained and the water that causes the trouble. In this sea-wall a conduit is placed, and all the sewers leading in that direction are connected therewith, thus cutting off all connection between the sewers and the water. The conduit will deposit the water into the reservoir, from which it is pumped over the wall into the water. The reservoir is provided with suitable pumping machinery for this purpose, and in places where the sea-wall is not needed and the character of the country is such that the water will have to be conveyed some distance before it can be emptied into a stream or other body of water a stand-pipe may be used to give the necessary pressure to force the water through the pipe.

The flushing apparatus shown in Fig. 7 is designed to be used in small sewers where the placing of the flushing apparatus heretofore described would be too expensive to use. This device is portable and provided with arms a^7, which prevent it from falling through the man-hole opening a' into the sewer. The hose is attached to the nipple a^8, and the water passes through an opening on the opposite side, the weighted end a^9 holding it in position during this operation.

The sea-wall may be provided with a conduit B for electric-light or other wires and be provided with passages for gas and water pipes.

What I desire to claim as new is—

1. In a system of sewerage for draining low lands, the combination of a reservoir having its bottom lower than the land to be drained, a conduit or main sewer extending from the reservoir to a point higher than the bottom of the reservoir and having catch-basins arranged at intervals, man-hole openings above the catch-basins, a jet or flushing pipe located adjacent to the head of each catch-basin, so as to direct its jet or flow upon the sediment at the head of the basin and over the floor of the latter to wash said sediment out of the basin from its head to its exit end in direction of the mouth of the sewer, and a water-supply for each said jet-pipe independent of the waters in the sewer, substantially as set forth.

2. In a system of sewerage for draining low lands, the combination of a reservoir having its bottom lower than the land to be drained, a conduit or main sewer extending from the reservoir to a point higher than the bottom of the reservoir and having catch-basins arranged at intervals for each catch-basin, a jet or flushing pipe located at the head of said basin and adjacent to the floor of the basin, a valve on the end of said pipe, and devices for closing said valve and holding it closed until the water-pressure in the pipe opens said valves, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. McGOWAN.

Witnesses:

GEO. R. BYINGTON,

M. F. HALLECK.