

(No Model.)

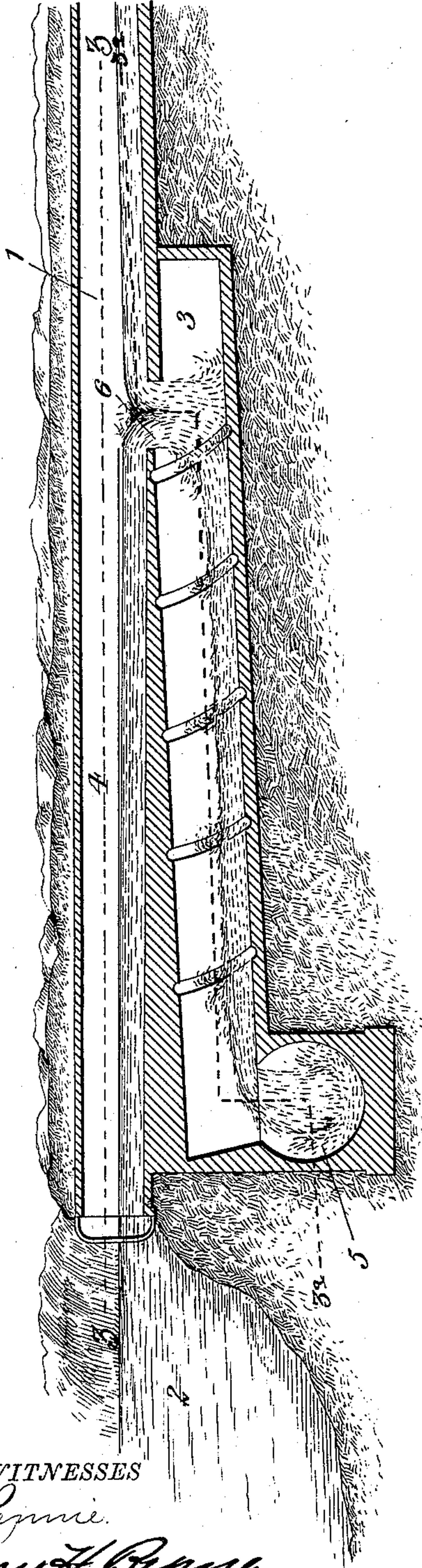
2 Sheets—Sheet 1.

J. C. MCGOWAN.  
SEWER.

No. 596,531.

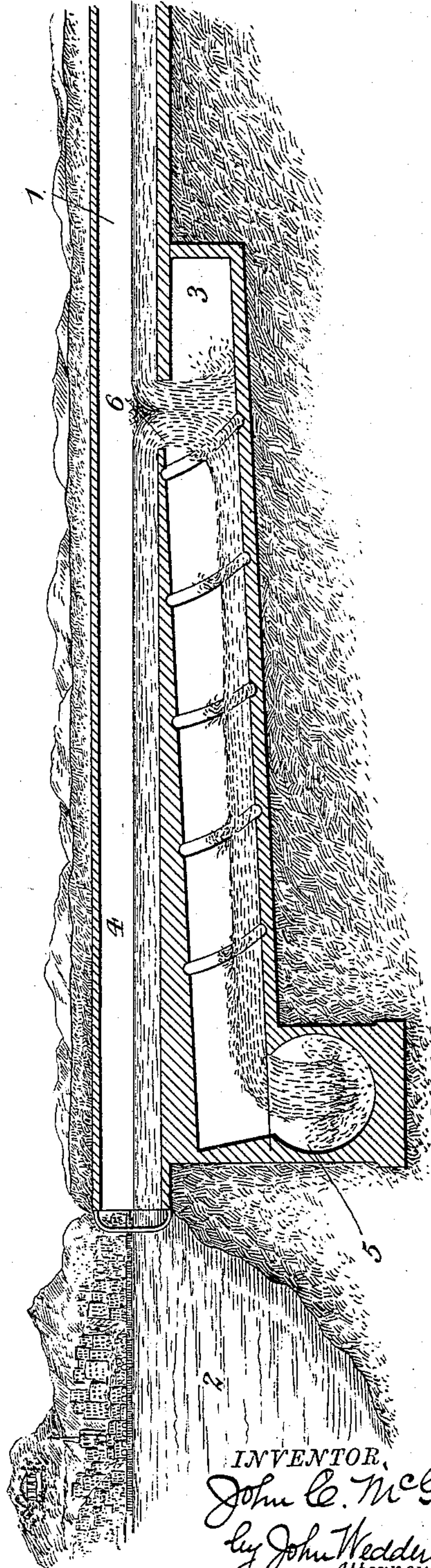
Patented Jan. 4, 1898.

Fig. 1.



WITNESSES  
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*Henry H. Byrne.*

Fig. 2.



INVENTOR,  
*John C. McGowan*  
by *John Wedderburn*  
Attorney



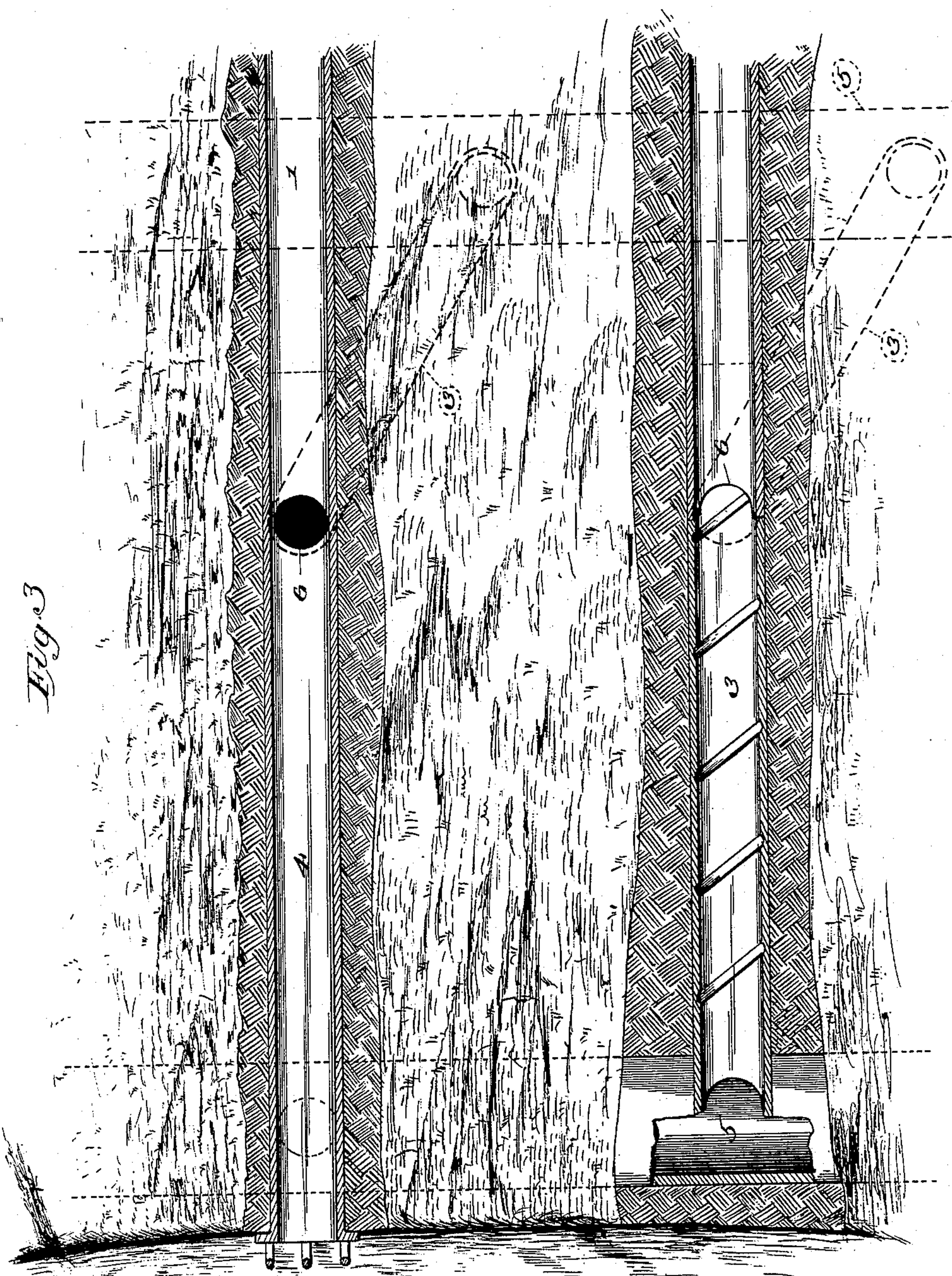
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Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN C. MCGOWAN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
OF ONE-HALF TO ORSON G. MCCALL, OF SAME PLACE.

## SEWER.

SPECIFICATION forming part of Letters Patent No. 596,531, dated January 4, 1898.

Application filed December 19, 1896. Serial No. 616,337. (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, (Georgetown,) in the District of Columbia, have invented certain new and useful Improvements in Sewers; 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 ap-  
10 pertains to make and use the same.

This invention has reference to a construction in sewers and drain-conduits for the purpose of disposing of the sewage of cities and also a novel system for treating and dispos-  
15 ing of sewage.

The invention consists in the features of construction and in the system hereinafter fully described and specifically claimed.

In the accompanying drawings, forming a  
20 part of this specification, Figure 1 is a vertical section illustrating a sewer constructed in accordance with this invention. Fig. 2 is a vertical section of the same, illustrating the manner in which these improvements can be  
25 applied to sewers now in use. Fig. 3 is a horizontal section taken on the lines 3 3 and 3<sup>a</sup> 3<sup>a</sup> of Fig. 1.

The primary object of this invention is to give a primary sewer or drain-conduit a sufficient fall, the lack of which is the greatest  
30 objection to the same and which causes the most unsanitary conditions.

In accordance with the principle involved I propose to construct what is termed a "main"  
35 discharging-sewer that skirts the territory to be drained and which can be placed at any depth that is sufficient to give the requisite fall to the primary sewers or conduits. This main discharging-sewer can be placed any  
40 depth necessary and can be of any length desired, for the purpose of bringing its mouth to a point to give the desired inclination, or the main discharging-sewer may be provided with a pump for the purpose of re-  
45 moving the liquid therefrom. In this way it is seen that instead of depending upon the body of water adjacent the territory to be drained, and owing to the level of which it is impossible in most cases to give the pri-  
50 mary sewers or conduits the requisite fall, the said primary sewers or conduits can be

set at any inclination consistent with the depth of this main discharging-sewer, which is obvious.

I will now proceed to describe the exact  
55 construction shown in Figs. 1, 2, and 3, in which the arrangement is made for carrying off the sewage of a city.

In the figures of the drawings, 1 indicates the primary sewer leading from the city, and  
60 2 the body of water or a source from which water may flow. It is understood that this invention can be applied either to tide-water or inland cities. The said primary sewer 1 communicates at its mouth with what I term  
65 a "gravity-sewer" 3, and also an intake 4, which latter also communicates with this gravity-sewer 3. The intake 4 is further in communication with the body of water 2, or the source from which water may flow, and  
70 the gravity-sewer 3 communicates at its lower end with the main discharging-sewer 5. This construction is shown in said Figs. 1, 2, and 3, while the only difference between the said  
75 figures is that in Fig. 1 the intake 4 falls from its mouth toward the opening 6, where it communicates with the gravity-sewer, while in Fig. 2 the inclination of the intake is in an  
80 opposite direction, thus illustrating the manner in which this invention can be applied to the old sewers of tide-water cities.

It will be noted on inspecting Fig. 1 that both the primary sewer 1 and the intake 4 incline toward the opening 6. This of course  
85 is the most approved construction for this system of sewers when being constructed in the first place; but, as before pointed out, it is possible to change the sewers now in use in accordance with this invention, and this idea is exemplified in Fig. 2. In this figure  
90 the primary sewer 1 and intake 4 are supposed to have formerly been an ordinary sewer leading to the body of water as they are now constructed, and in changing the system the inclination toward the mouth of the old sewer  
95 is not interfered with, but the opening 6 leading to the gravity-sewer is made so that the water passes in from the body of water into the intake, and instead of backing up into the primary sewer, as it does at high tide, it  
100 will flow into the gravity-sewer through this opening. The mouth of the intake is below



the level of the body of water, which causes a flow of water to pass constantly therefrom through the opening 6. Of course it is understood that in tide-water cities and especially in connection with old sewers, where at the ebb-tide the level of the water is below the level of the mouth of the sewer, this flow of water from the intake to the gravity-sewer is intermittent and only when the tide is high enough, as is obvious.

In Fig. 3 I have shown, in dotted lines to the right of said figure, the manner in which it is possible to place the gravity and the main discharging sewers otherwise than is shown in Figs. 1 and 2. In Figs. 1 and 2 the main discharging-sewer 5 is near the body of water, while the gravity-sewer is situated directly below the intake, and therefore is not seen in the part of Fig. 3, taken on the line 3 3, although it is shown in that part taken on the line 3<sup>a</sup> 3<sup>a</sup>. The dotted lines to the right of Fig. 3, however, show that the gravity-sewer can lead from the juncture of the primary sewer 1 and the intake and at an angle thereto and also away from the body of water to the main discharging-sewer, which can be located in the most convenient position according to the judgment and discretion of the engineer. It is understood, of course, that the main discharging-sewer that skirts the territory to be drained and which is in communication with all the primary sewers 1 can be sunk to any depth and emptied either by being carried far enough to reach low ground or by means of pumps. By placing these main discharging-sewers at the desired depth it is seen that they can have a considerable fall and at the same time the fall of the primary sewers 1 can be arranged as found most expedient and necessary to give the correct drainage. In any case, however, it is possible to place the main discharging-sewer low enough to afford the desired fall for the primary and gravity sewers. It is seen that the water entering the intake meets the sewage from the primary sewers and intermixes with the same in flowing into the gravity-sewer, so that the sewage is diluted and in such proportion that when it passes from the main discharging-sewer it will have the consistency of clear water. It is seen that in the first dropping into the gravity-sewer the sewage is mixed and commingled; and as a further and separate improvement I propose to place within the gravity-sewer the riffles 7, which consist of spiral grooves in the interior of said pipe, so that as the mixed sewage and water passes through this gravity-sewer it is directed to one side by these spiral riffles or grooves, so that it causes a troubled flow, which thoroughly intermixes and separates the sewage. It is seen, therefore, that the supply of water from the intake is of sufficient quantity to dilute the sewage sufficiently to prevent the decomposition of organic matter, and, further, the sewage does not enter the water near to or surrounding the city to be drained, and

this is unpolluted. Owing to the fact, also, that there is a constant supply of water the sewage will be carried, owing to the rapidity of the flow, to the place of final disposal before decomposition commences.

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

1. The combination with a primary sewer or channel open at its ends and which ends are always in communication with sources from which water may flow, of a gravity-sewer communicating at its upper end with said primary sewer or channel, and a main discharging-sewer communicating with the lower end of said gravity-sewer.

2. The combination with a plurality of primary sewers or channels which are open at their ends and which ends are always in communication with sources from which water may flow, of a plurality of gravity-sewers communicating at their upper ends with the said primary sewers, and a main discharging-sewer communicating with the lower ends of said gravity-sewers.

3. The combination with a primary sewer or channel and an intake communicating at all times with each other and with sources from which water may flow, of a gravity-sewer situated below the adjacent ends of said primary sewer and intake and communicating therewith, and a main discharging-sewer communicating with the lower end of said gravity-sewer.

4. The combination with an inclined primary sewer or channel, and an oppositely-inclined intake communicating at all times with sources from which water may flow and with the said inclined primary sewer or channel, of a gravity-sewer situated below the lower adjacent ends of said primary sewer and intake and communicating therewith, and a main discharging-sewer communicating with the lower end of said gravity-sewer.

5. The combination with a plurality of primary sewers, and a plurality of intakes, said intakes communicating at all times with a source from which water may flow and with the said primary sewers or channels, of gravity-sewers having their upper ends communicating at all times with said primary sewers and intakes, and a main discharging-sewer communicating with the lower ends of said gravity-sewers.

6. The combination with a primary sewer or channel open at its ends and which ends are always in communication with sources from which water may flow, of a gravity-sewer communicating at its upper end with said primary sewer or channel, said gravity-sewer having riffles or grooves therein, and a main discharging-sewer communicating with the lower end of said gravity-sewer.

7. The combination with a primary sewer or channel open at its ends and which ends are always in communication with sources from which water may flow, of a gravity-



sewer communicating at its ends with said primary sewer or channel, said gravity-sewer having spiral riffles or grooves therein, and a main discharging-sewer communicating with  
5 the lower end of said gravity-sewer.

8. The system herein described consisting of primary sewers or channels for collecting the sewage, a main discharging-sewer into which the sewage collected by said primary  
10 sewers or channels flows and which leads to a place of final disposal, and means for admitting water to said sewage after it leaves

the primary sewers or channels and before reaching the main discharging-sewer and for thoroughly commingling said sewage and 15 water.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN C. MCGOWAN.

Witnesses:

J. H. BRADLEY,  
O. G. MCCALL.