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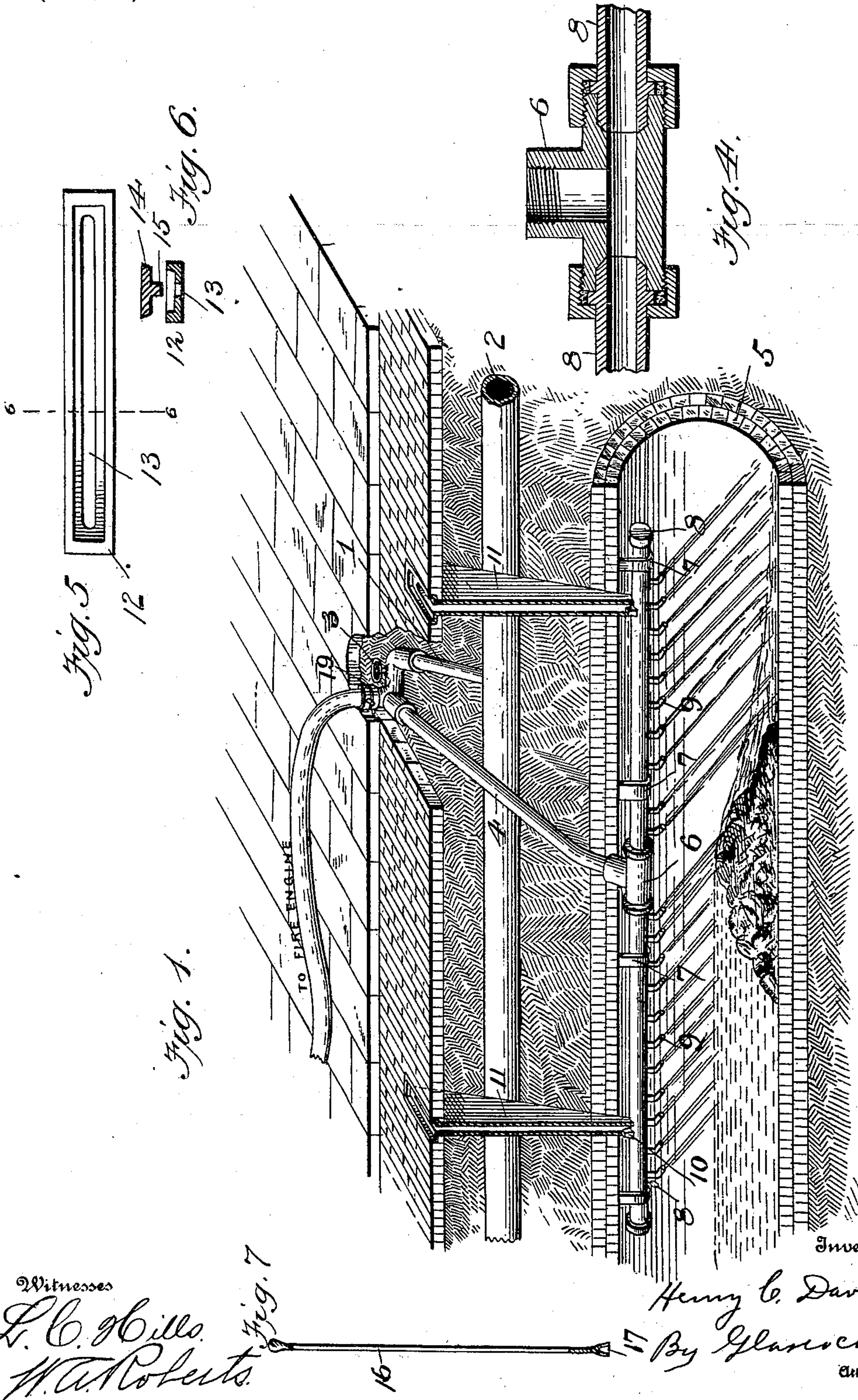
Patented May 2, 1899.

H. C. DAVIS.  
FLUSHING AND CLEANING SEWERS.

(Application filed Mar. 31, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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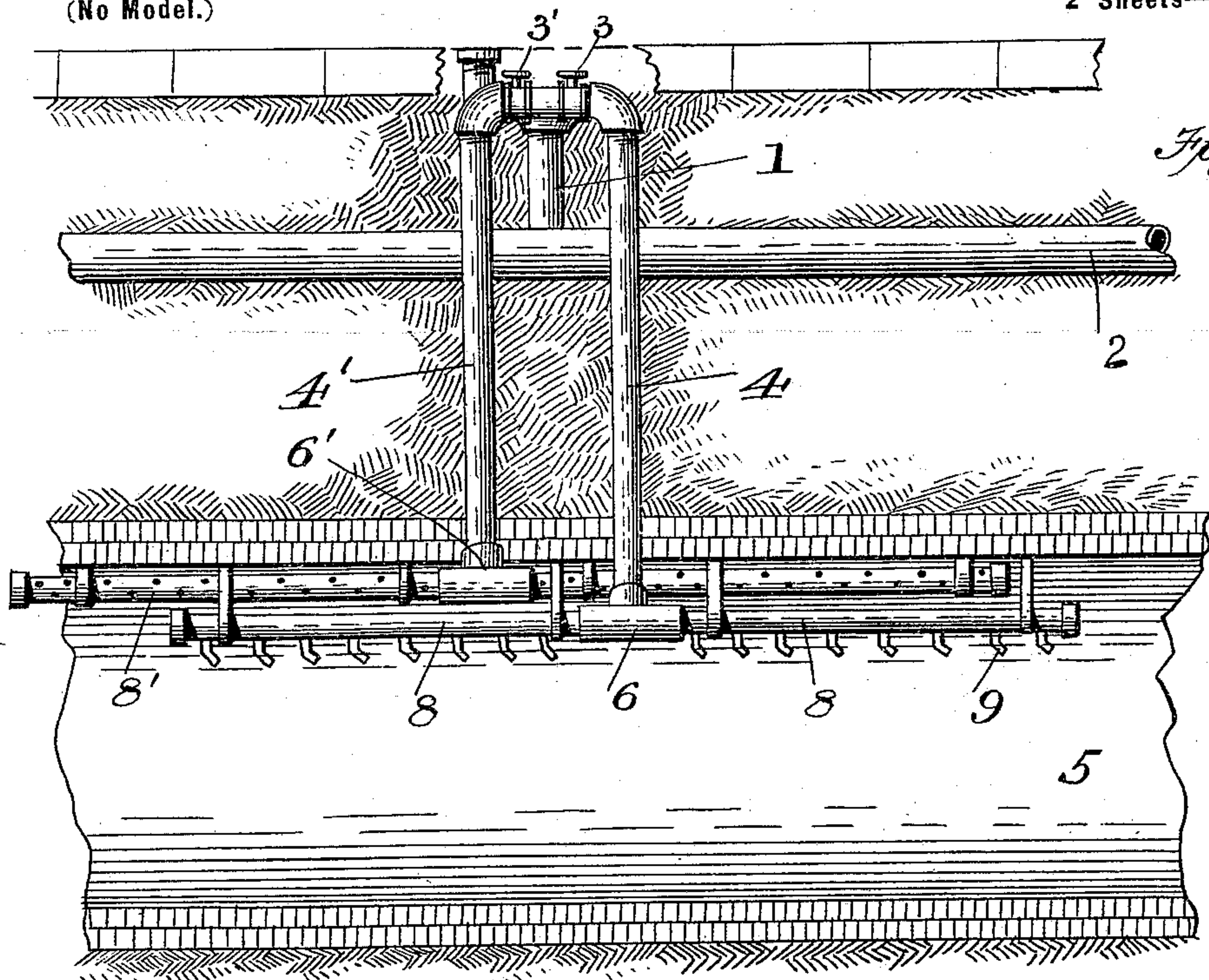
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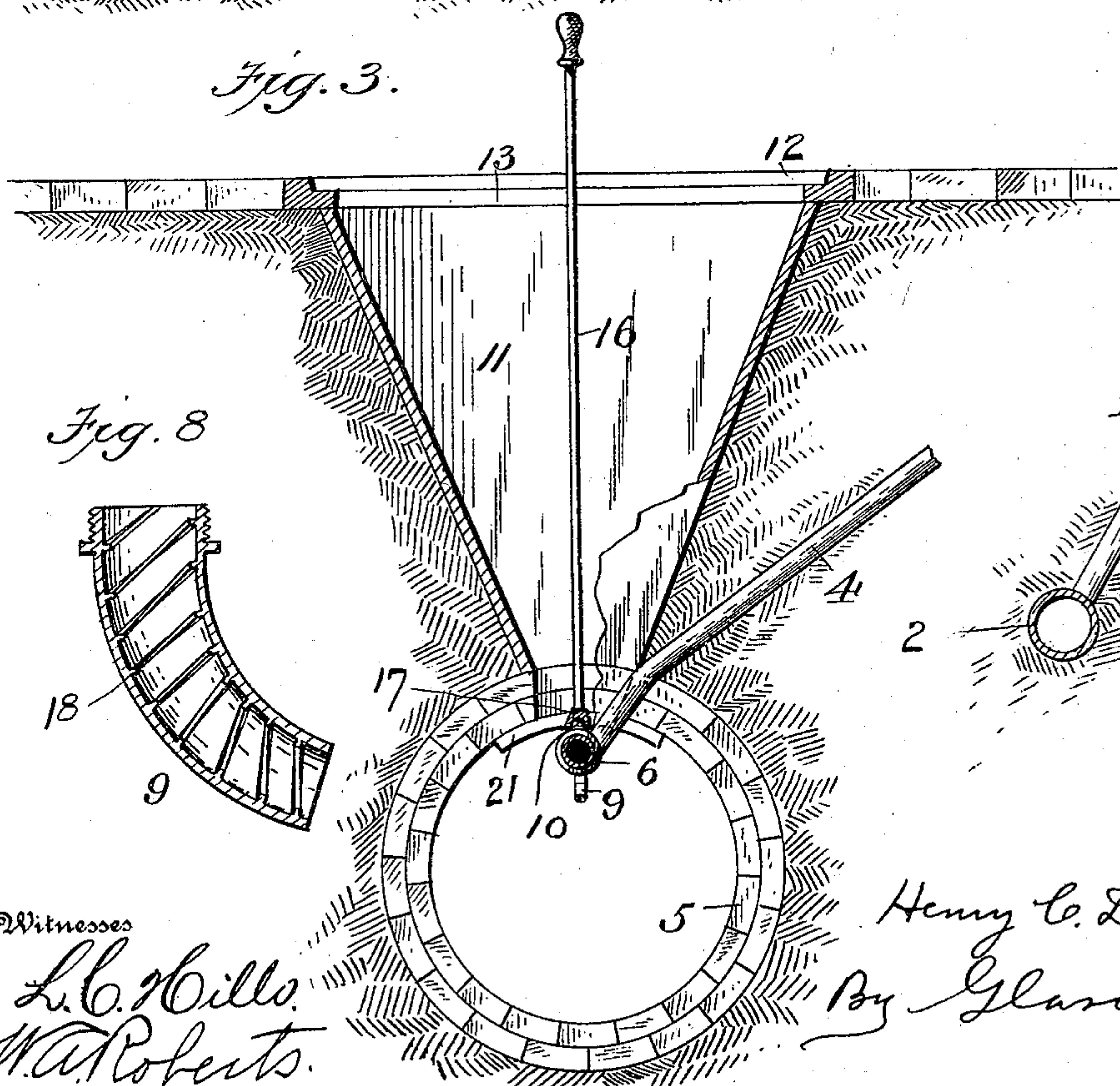
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*Fig. 2.*



*Fig. 3.*

*Fig. 8.*

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# UNITED STATES PATENT OFFICE.

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## FLUSHING AND CLEANING SEWERS.

SPECIFICATION forming part of Letters Patent No. 624,188, dated May 2, 1899.

Application filed March 31, 1898. Serial No. 675,946. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. DAVIS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Flushing and Cleaning 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 appertains to make and use the same.

My invention has relation to means for washing and cleaning sewers; and it consists in the novel construction and arrangement of its parts, as hereinafter described.

The object of the invention is to provide a device that will effectually cut or remove the deposit from the sides of the sewer and wash the said deposit down the sewer. The device consists of a water-pipe connecting a street-main with the sewer, a set of nozzles or other water-discharge device being located within the sewer and connected to the water-pipe. The water discharged from the said nozzles is adapted to cut the material from the sewer and wash it through the same.

The further object of the invention is to so mount the nozzles in the interior of the sewer that they may be partially revolved, and thus the discharge from the nozzles may be directed on any or all sides of the interior of the sewer. A suitable means is provided for so operating the nozzles.

In the accompanying drawings, Figure 1 is a perspective view, partly in section, showing a sewer and a water-main and my invention connected thereto. Fig. 2 is a sectional view of a modified form of the invention. Fig. 3 is a transverse sectional view of a sewer, showing the means for operating the nozzles and the street-main to the right. Fig. 4 is a sectional view showing the T connection between the water-pipe leading into the sewer and the pipe supporting the nozzles. Fig. 5 is a top plan view of a plate adapted to be located in the surface of the street, said plate having an elongated slot through which a lever is inserted to operate the nozzles in the sewer. Fig. 6 is a transverse sectional view cut on the line 6 6 of Fig. 5, showing the said plate and a cover for the same. Fig. 7 is a side

elevation of the lever, the lower end thereof being shown in section; and Fig. 8 is a sectional view of one of the nozzles, showing the spiral groove located in the interior thereof.

In the form of the invention as shown in Fig. 1 the pipe 1 is connected at one end to the street-main 2. The said pipe passes under the curbing of the pavement, and just within the curbing the said pipe is provided with a valve 3. The pipe 4 is connected at one end to the pipe 1, the lower end of said pipe 4 passing through the top of the sewer 5. A T connection 6 is fixed to the lower end of the pipe 4, said T connection being in the interior of the sewer. Suitable brackets 7 are secured in the interior of the sewer in the upper portion thereof, and the pipe-sections 8 8 are journaled in the said brackets. The inner ends of the pipe-sections 8 8 are connected by suitable unions to the T 6, the said pipe-sections 8 8, however, being adapted to turn or partially revolve within the bearings or brackets 7. Fig. 4 is a detailed sectional view of one means that might be employed for connecting the sections 8 8 to the T 6. The outer ends of the pipe-sections 8 8 are closed by caps or other suitable means, and on the under sides of the said pipe-sections 8 8 the nozzles 9 9 are located, said nozzles being arranged in a row and set at suitable intervals apart. Each pipe-section 8 is provided on its upper side with a projection or lug 10. A substantially V-shaped casing 11 extends from the surface of the street down through the top of the sewer 5, and the lower end of the said casing receives the lug 10 of the pipe 8. A suitable plate 12 is fixed to the upper end of the casing 11, said plate being fixed in the street flush therewith, the said plate having an elongated opening or slot 13, and a removable cover 14 being provided, said cover being adapted to fit on the plate 12, the rib 15 being adapted to enter the elongated slot 13, and thus normally hold the cover 14 in its proper position upon the plate. A lever 16 is provided for operating the pipe-sections 8 8, said lever having at its lower end a suitable recess or socket 17, said socket being adapted to receive the lug 10 of the pipe-section 8. It will thus be seen that when the lever 16 is inserted through the slot 13 of the



plate 12 and passed down through the casing 11 and the socket 17 made to receive the lug 10 of the pipe 8, as shown in Fig. 3, then by moving the lever to one side and then the other, so that the pipe-section 8 will be caused to describe a partial revolution, the nozzles 9 9 will be pointed to one side and then the other of the interior of the sewer. The said nozzles 9 are preferably made as shown in Fig. 8—that is, the nozzles are curved or bent at an intermediate point and are adapted to extend in the direction of the fall of the sewer, each nozzle being provided in its interior with a spiral groove 18.

In operating the device as above described the operator turns on the valve 3, thus permitting the water from the street-main to pass through the pipe 1, through the pipe 4, through the T connection 6, into the pipe-sections 8, and out through the various nozzles 9 9. While the water is being expelled from the nozzles the operator inserts the lever 16 down through the casing 11, as above described, and partially revolves the pipe-sections 8. To thoroughly cleanse the side walls of the sewer, the water in passing through the nozzles 9 is given a twisting motion by means of the spiral groove 18, and thus the jets as they strike the sides of the sewer are very penetrating and will cut the deposit from the sides of the sewer. When the operation is completed, the operator turns off the valve 3, removes the lever 16, and puts the cover 14 in its proper place over the plate 12.

The operation as above described is followed when the street-pressure is sufficient to remove the debris from the sewer. However, should it be found desirable to increase the force or pressure of the water a connection 19 may be provided in conjunction with the pipe 4, and to the said connection a fire-hose 20 may be attached, a suitable engine adapted to pump water being connected to the other end of the hose. When the engine is used, the valve 3 is closed, and thus the water pumped by the engine passes down through the pipe 4 and into the sewer, as above described, and effectually removes the deposit from the sides or bottom of the sewer.

Should it be found necessary or deemed advisable to take precautions to prevent the escapement of sewer-gas during the time that the pipe-sections 8 are being operated, a suitable strip 21 may be connected to the upper portion of the pipe-sections 8, said strip 21 being preferably flexible and bearing at its upper surface against the upper portion of the interior of the sewer, and thus as the pipe-section 8 is partially revolved the said flexible strip 21 tilts from one side to the other, but at all times closes the lower end of the casing 11, thus preventing the escapement of noxious gases.

In the form of the invention as shown in Fig. 2 a means for revolving the pipe-section 8 is not shown; but the means described or any equivalent means may be employed for

this purpose. In the said form of the device a pipe 4' is also connected to the pipe 1, the valve 3' being interposed between the pipes 1 and 4' in a similar manner as the interposition of the valve 3 between the pipes 1 and 4. A T connection 6' is attached to the lower end of the pipe 4', said T connection 6' being in the interior of the sewer and above the pipe-sections 8. The perforated pipe-sections 8' are connected at their inner ends to the T 6'. The device as shown in said Fig. 2 is operated as follows: The operator turns on the valve 3, thus permitting the water to pass from the main 2 through pipe 1, through pipe 4, through the T 6, through pipe-sections 8, and the nozzles 9 9 into the interior of the sewer. The water is permitted to run through the said nozzles for a suitable length of time—that is, until the operator is satisfied that the debris has been loosened from the sides of the sewer. Then the valve 3 is closed and the valve 3' is opened. The water then passing through pipe 4', T 6', and pipe-sections 8' and through the numerous perforations in the said sections the water is expelled in fine jets, and thus washes the loosened material down into the lower portion of the sewer. After the sewer is thoroughly cleansed the valve 3' is closed.

The valves 3 and 3' may be operated as above described or in any other suitable manner to meet the requirements incidental to the nature of the deposit in the sewer or the specific shape of the construction of the sewer, or at times it may be advisable to have both said valves open at the same time.

The devices above described may extend the entire length of the sewer, or they may be placed at suitable intervals throughout the length of the sewer, as may be deemed necessary or advisable.

As a considerable portion of the gas generated in sewers is soluble in water, my invention will have the effect to take up the gases and reduce the pressure in the sewer, thus preventing in a great measure the evil effects caused by this pressure and the escape of the gas into buildings which are connected with the sewer. The sprays from the nozzles and pipe perforations will also tend to prevent the return of gases into portions already cleansed.

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

1. In combination with a sewer and a water-main, a water-pipe connection connecting the sewer with the main, a rotatable pipe-section located within the sewer and connected with the water connection, discharge-nozzles leading from said pipe-section, a lever for revolving the pipe-section from aboveground through an opening in the sewer and means for preventing the escape of gases through said opening, substantially as described.

2. In combination with a sewer and a water-main, a water connection connecting the main



with the sewer, a rotatable pipe-section located within the sewer and connected to the water connection, a casing passing at its lower end through the upper portion of the sewer and extending to the street-surface, and a lug located on the rotatable section, said lug being beneath the lower end of the casing, said pipe-section having suitable discharge-nozzles.

10 3. In combination with a sewer and a water-main, a water connection connecting the water-main with the sewer, a rotatable pipe-section located within the sewer and connected to the water connection, a lug located on the rotatable pipe-section, a casing passing through the upper portion of the sewer and extending substantially to the surface of the street and a removable cover adapted to close the upper end of the casing, said pipe-section  
15 20 having suitable discharge-nozzles.

4. In combination with a sewer and a water-main, a water connection connecting the sewer with the main, a rotatable pipe-section located within the sewer and connected to the water  
25 connection, said pipe-section having suitable discharge-nozzles, the sewer having in its up-

per portion a suitable opening adapted to receive the means for operating the rotatable pipe-section, and a strip supported by the rotatable pipe-section, said strip bearing at its upper face against the inner side of the sewer and closing the said opening. 30

5. In combination with a sewer and a water-main, a water connection between the main and the sewer, a rotatable pipe-section located within the sewer and connected to the water connection, said pipe-section having a series of discharge-nozzles, a lug located on the rotatable pipe-section, a casing passing through the sewer and extending substantially to the surface of the street, said lug lying beneath the lower end of said casing, a slotted plate arranged at the upper end of the casing, and a removable cover for said casing, said cover being provided with a rib fitting within the slot of said plate. 35 40 45

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

HENRY C. DAVIS.

Witnesses:

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