

908,825.

C. WILLMS.
FLUSHING TANK.
APPLICATION FILED MAY 23, 1908.

Patented Jan. 5, 1909.
3 SHEETS—SHEET 1.

Fig. 1.

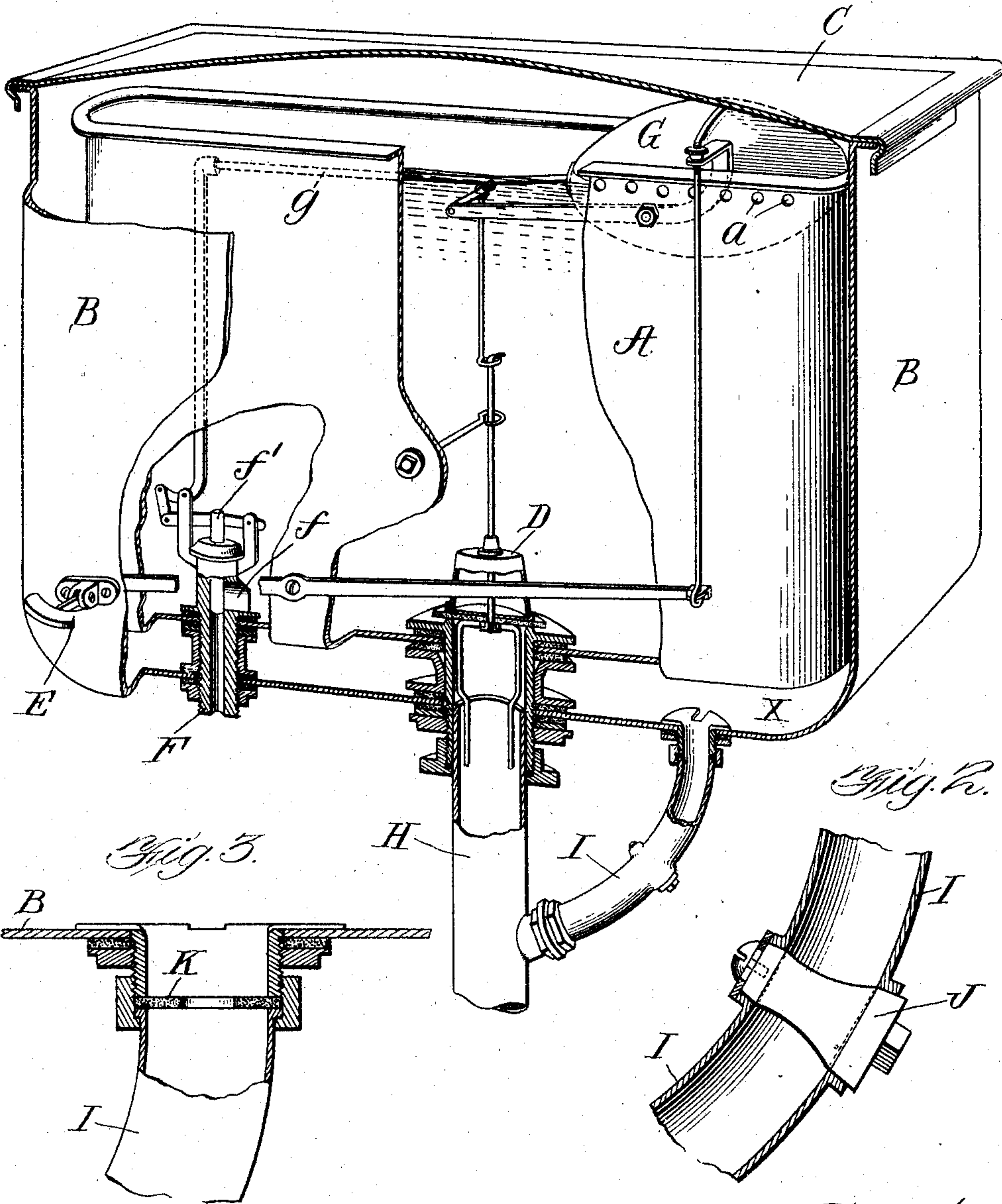


Fig. 2.

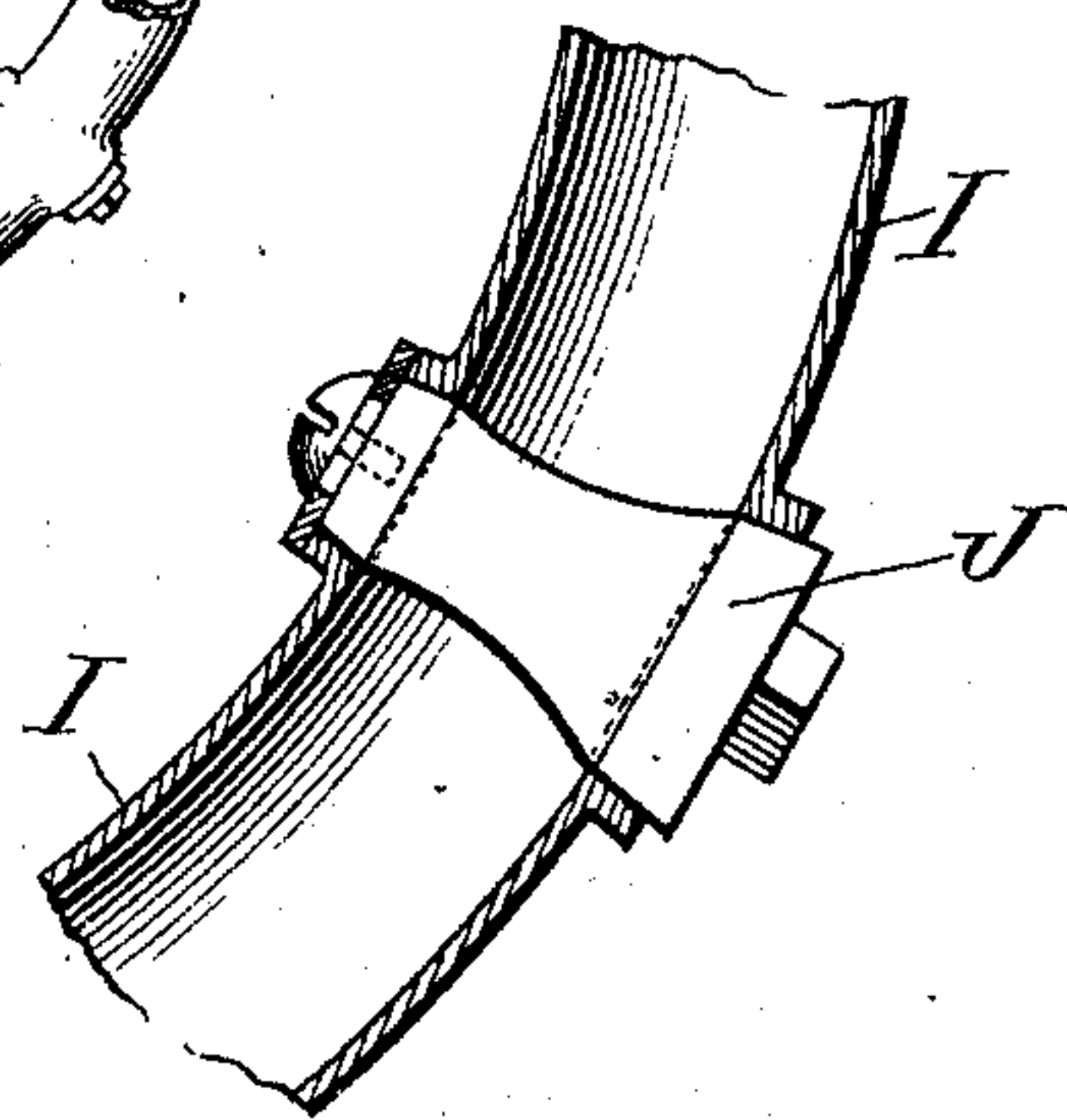
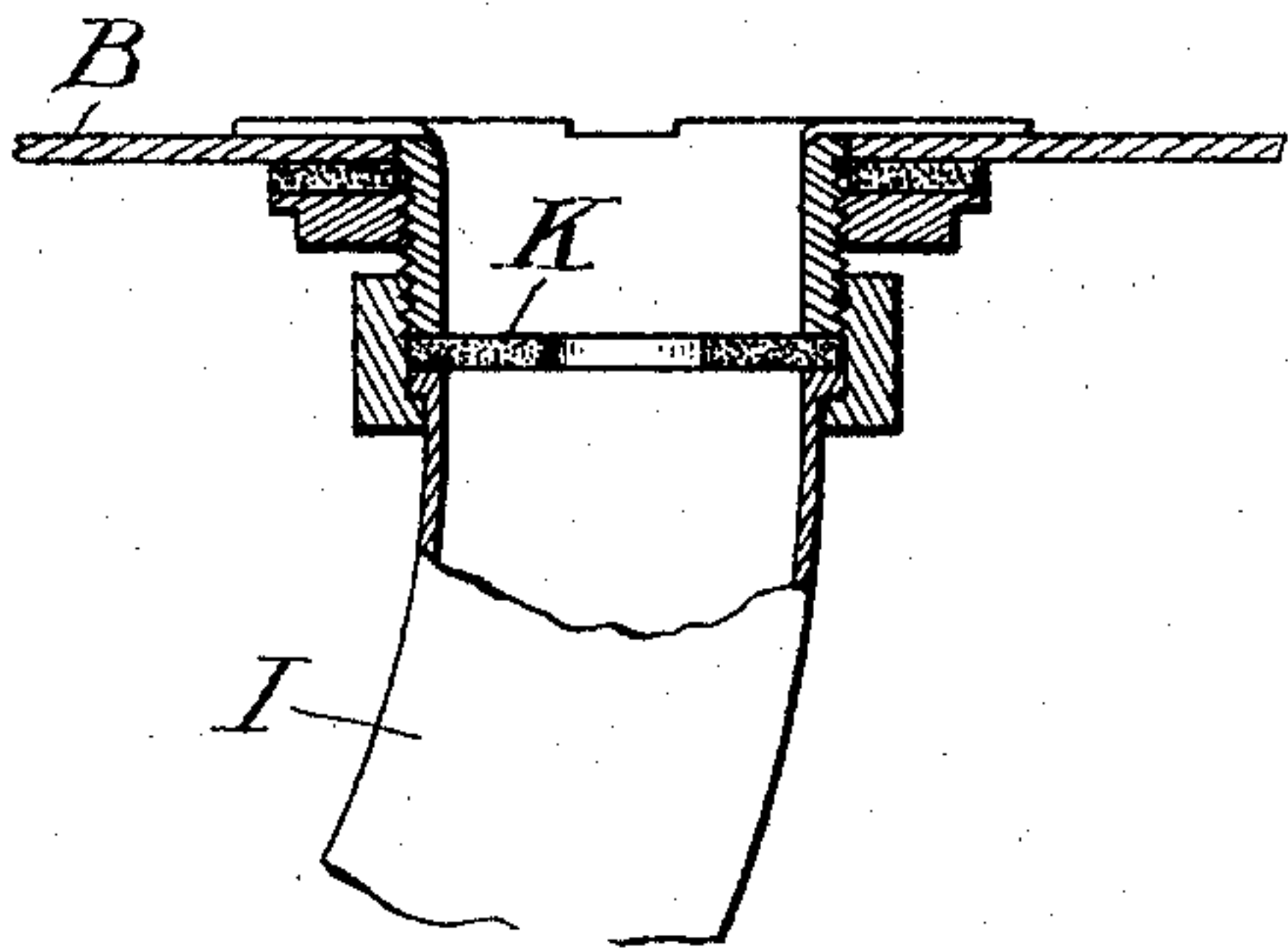
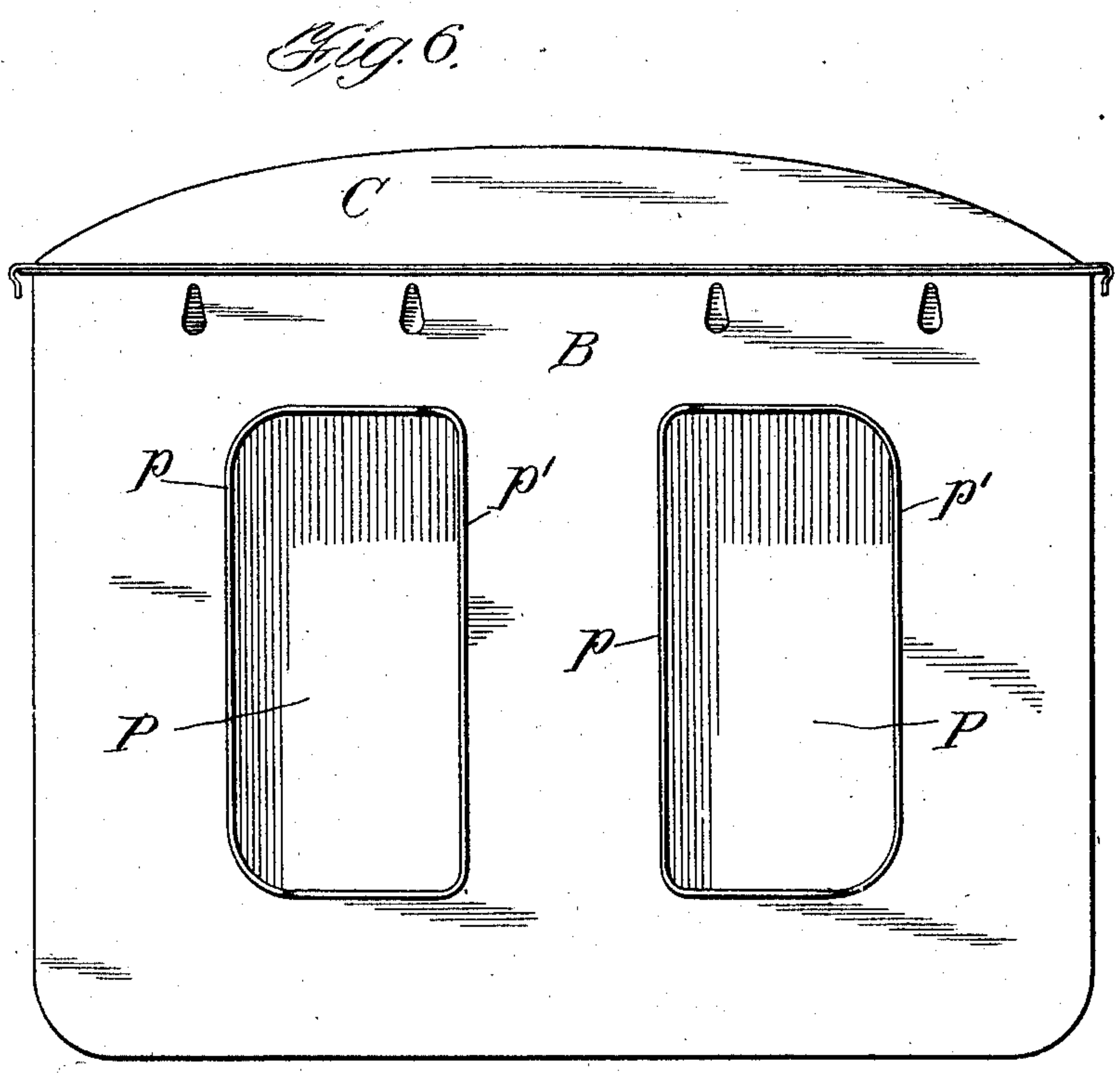
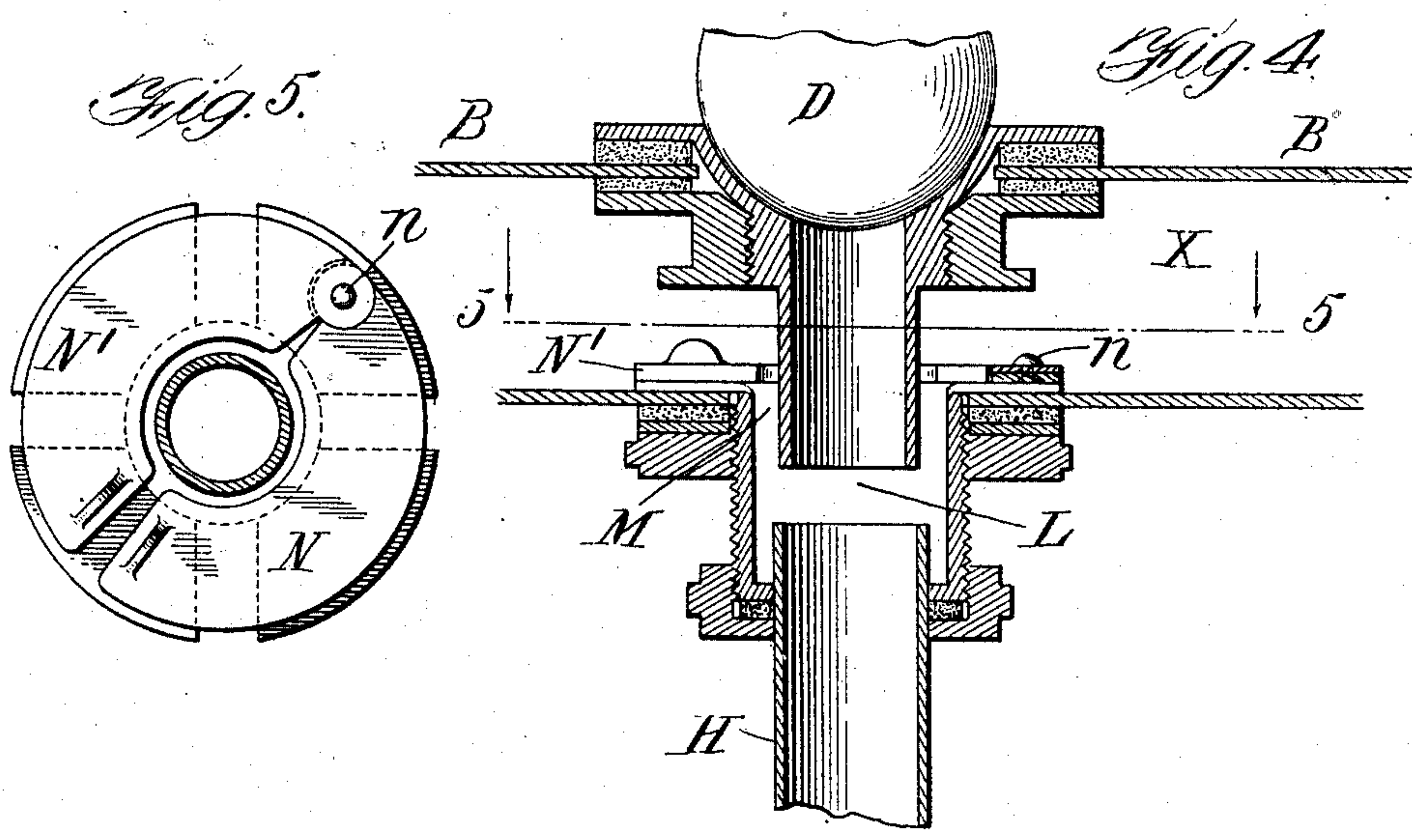


Fig. 3.



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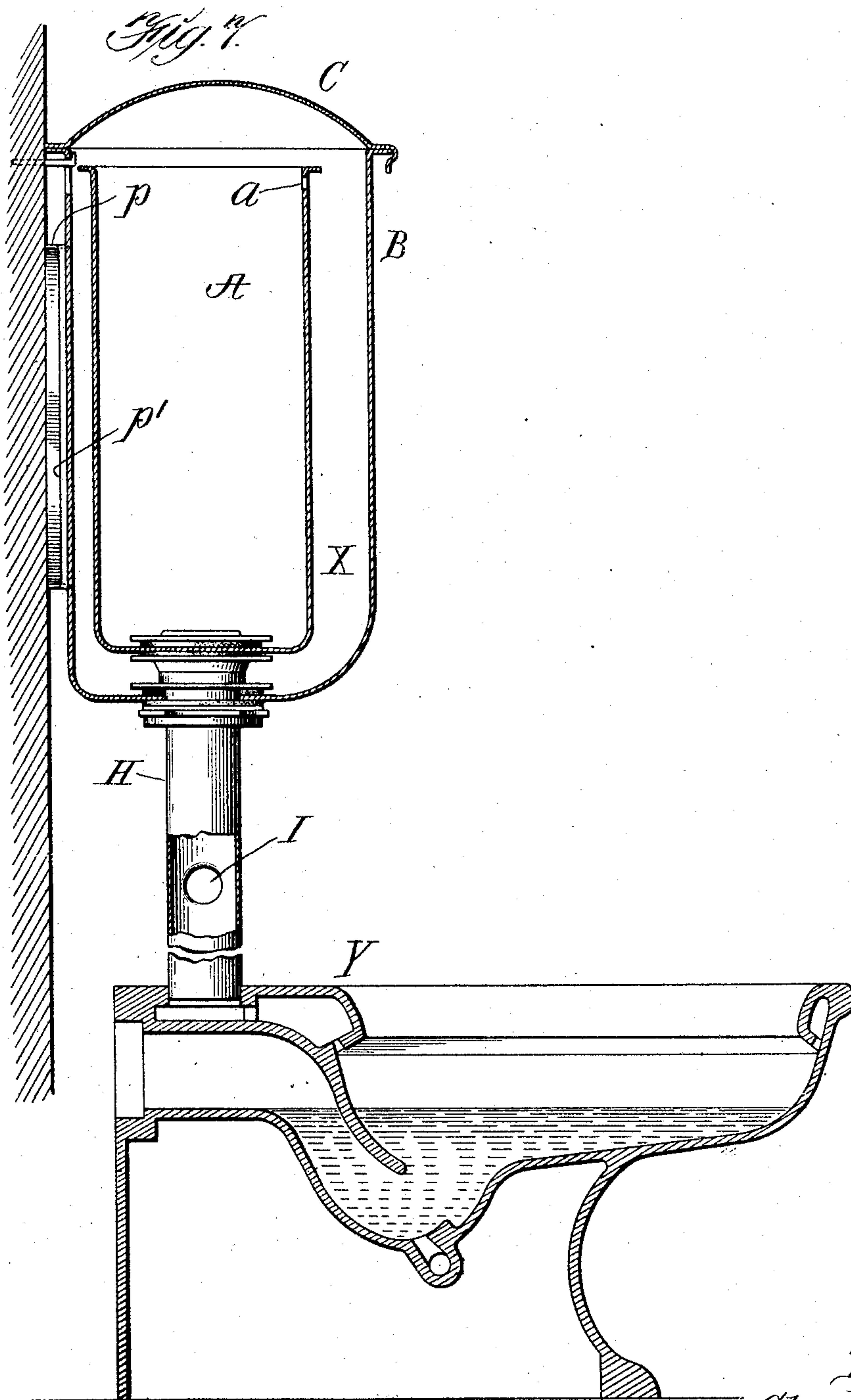
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C. WILLMS.
FLUSHING TANK.

APPLICATION FILED MAY 23, 1908.

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3 SHEETS—SHEET 3.

908,825.



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UNITED STATES PATENT OFFICE.

CHARLES WILLMS, OF BALTIMORE, MARYLAND, ASSIGNOR TO WILLMS SANITARY WORKS,
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FLUSHING-TANK.

No. 908,825.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed May 23, 1908. Serial No. 434,444.

To all whom it may concern:

Be it known that I, CHARLES WILLMS, a citizen of the United States, residing in the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Flushing-Tanks, of which the following is a specification.

My present invention relates to flushing-tanks of the class shown in Letters Patent of the United States heretofore granted to me as follows: 838,601 of Dec. 18, 1906; 848,147 of March 26, 1907; 849,708 of April 9, 1907; 850,989 of April 23, 1907, and 869,953 of November 5, 1907. In these patents I have shown tanks made of sheet metal without wood casings but which are provided with what I have called condensation-collectors which serve to receive the water of condensation collecting on the outside of the tanks, such condensation-collectors or receivers being connected by means of the discharge-pipes of the tanks with the closet-bowls. As described in my patents, the condensation-collector also serves to receive any overflow which may occur from the tank, and in my Patent No. 838,601 of Dec. 18, 1906, I have shown a small pipe or tube conveying water from the ball-cock during the time that the tank is filling after the flushing operation, for the purpose of supplying a sufficient amount of water to the bowl to provide a water-seal after the flushing action has removed the flush-water therefrom. It is quite usual to employ a small pipe or tube for this purpose and in my patent above referred to, I have shown such a tube supplying water to the closet-bowl by way of the condensation-collector. I have now found that this device may be entirely dispensed with and this is very desirable for many reasons. In the first place, it is an additional expense, secondly, in order to raise the supply water in the tube to a sufficient extent, it is necessary to provide a sufficient pressure by making the supply-port to the tank of quite small area, especially when the supply-pressure is low. For this reason, the operation of filling the tank is often quite prolonged and it is not usually possible to flush a second time until a considerable period has elapsed. I have discovered that by properly proportioning the sizes, lengths or areas of the flush-water discharge-pipe and the pipe of passage leading from the condensation-receiver, I may cause sufficient

water to flow from the flush-water discharge-pipe in the act of flushing into the receiver where it collects and from which, after the flushing operation has ceased, it flows into the bowl and provides the required water-seal. It will be understood that in all modern closets there is an obstruction to the flow of flush-water. Such is the case in siphon-jet closets or hopper-trap bowls. This obstruction to the flow of water causes the flush-water to back up in the discharge-pipe from the tank and by my improvements I cause such water to back up into the condensation-receiver in a sufficient quantity to provide the water-seal.

By my improvements I can make the supply-port for the tank much larger than heretofore and hence can fill the tank more quickly and I am able to so proportion the parts as to supply the legal or required amount of flush-water and the amount necessary for a water-seal from a tank of minimum size without waste of material.

In the accompanying drawings:—Figure 1 is a perspective view with parts broken away, of a flushing-tank embodying my improvements. Fig. 2 is a detail view in section of a device which may be employed for regulating the size of the passage through which flush-water backs up into the receiver and through which it flows back to provide a water-seal in the closet-bowl. Fig. 3 is a detail view of a modified way of regulating the size of this passage. Fig. 4 is a detail view in section illustrating another way of conveying water to and from the condensation-receiver. Fig. 5 is a plan view of devices which may be employed for regulating the size of the passage shown in Fig. 4. Fig. 6 shows a rear elevation of the tank shown in Fig. 1. Fig. 7 is a view mainly in vertical central section showing the manner in which the tank is applied to a wall and how it is connected with a closet-bowl.

The general organization of the tank and its accessories, is similar to that shown in my patents above mentioned and in my application for Patent No. 369,719, filed April 23, 1907.

The water-containing-tank A is surrounded by a jacket or condensation-receiver B, which is provided with a removable cover C. There is an air-space X surrounding the water-containing-tank between

it and the condensation-receiver. The inlet-valve D is operated through the connections shown, by means of an arm-rest E, in the manner shown and described in my application for Patent of April 23, 1907, above referred to. The ball-cock F is of a well-known form, but the port *f* is much larger in area than is usually the case and there is no connection with a pipe or tube for supplying water to provide a water-seal. The valve *f'* of the ball-cock is connected to the float-rod *g*, which latter carries an oval, oblong or egg-shaped float G, constructed in the manner shown and described in my application for Patent No. 434,443, filed May 23, 1908. The advantages of a float of this kind are fully set forth in my said application and it will be observed that the oval float enables me to utilize the maximum part of the tank for containing water, while the cover may be brought down close to the top of the tank without interfering with the operation of the float. If a spherical float were employed, the water level would necessarily be lower or the cover arched to a greater extent. The float is intended to drop and rise only a short distance in order to operate the ball-cock and it affords an extended surface upon which the water acts promptly as it rises and a large buoyant surface which causes the valve of the ball-cock to be held more firmly in place when closed.

The water-containing-tank A is connected with the closet-bowl Y by means of a flush-water discharge-pipe H in the usual way and the condensation-receiver B is connected with the pipe H by means of a branch-pipe I. As in my prior patents, water of condensation accumulating on the outside of the walls of the tank A will be received by the condensation-receiver and will pass through the pipe I to the discharge-pipe H. In like manner, any water overflowing through the holes *a* at the top of the tank will be discharged through the pipe I. I have found that by providing a branch-pipe of suitable length and area and connecting it at the proper elevation in the pipe H, I can cause a sufficient amount of the flush-water to pass up through the branch-pipe I during the flushing operation into the condensation-receiver and then, after the flush-water has left the bowl, descend into the bowl and produce the requisite water-seal. If the pipe I be of very small inside diameter, the flush-water will not rise through it, owing to the great resistance thus produced. If the pipe I is connected with the discharge-pipe at too low an elevation, the water will not properly rise and if it be connected up too high, too much of the flush-water will pass into the receiver. It is possible to select a pipe of the proper area and connect it at the proper elevation with the

discharge-pipe H and to make the pipe H of the proper length but in order to regulate the size of the passage through the pipe I, the latter may be provided with a plug J, having a passage through it and which may be so turned as to regulate to any desired extent the passage in the pipe in which case the sizes of the pipes I and H and their lengths need not be so closely calculated as the relative sizes of the passages may be controlled by the plug J. The same result may be obtained by employing washers K of various sizes, in the manner indicated in Fig. 3. If the passage through one washer is found to be too large, a washer having a smaller passage may be substituted.

In the organization shown in Figs. 1 and 7, I have obtained good results by employing a discharge-pipe H, the interior diameter of which is 2 inches, while the interior diameter of the branch-pipe I is $\frac{3}{4}$ of an inch, and by connecting the various pipes in the manner indicated. Instead of employing a branch-pipe I like that indicated in Fig. 1, I may construct a connection between the condensation-receiver and the discharge-pipe of the kind illustrated in Figs. 4 and 5. This general arrangement is shown in my Patent No. 848,147 of March 26, 1907 above referred to. In this case, instead of employing a branch-pipe, the discharge-pipe is made in sections with an intervening space L between the sections, with which communicates a passage M from the condensation-receiver. The area of this passage may, in the first instance, be made of the proper relative size to permit the proper amount of water to pass into the condensation-receiver to provide the water-seal, but the size of this passage may be regulated in any suitable way, as by the devices shown in Fig. 5, where two segmental plates N, N', are shown pivoted together at *n*, which will permit them to be brought close together or spread apart to adjust the area of the passage M.

By my improvements, I am enabled to control absolutely the amount of water delivered through the ball-cock at each operation to supply the required or legal amount of water for flushing and sealing purposes. In the tank shown in the drawing, every inch inside the tank, measured vertically, contains one-half a gallon of water and the tank is $13\frac{1}{2}$ inches deep, so that five gallons are provided for flushing purposes, three-quarters of a gallon or three quarts, for sealing purposes (which is the usual amount employed) and a small surplus which remains in the tank. In this way, the tank may be made of proper size but having no excessive area so that not only can metal be saved, but the dimensions of the tank may be kept within such limits that it may be easily formed without seam of thin sheet metal and enameled in the manner described

in my former patents, and as before stated, the relative areas of the pipes H and I or the relative areas of the passages illustrated in Fig. 4, may be so regulated as to insure that only the required amount of water, say three quarts, shall be conveyed to the condensation-receiver for sealing purposes. While the sealing-water does not flow back from the condensation-receiver so promptly as to be siphoned out through the bowl with the flush-water, it nevertheless flows back much more promptly and produces a seal much faster than is the case where a small tube connected with the ball-cock is employed.

As described in my former patents, it is necessary that the space X between the tank and the condensation-receiver shall be thoroughly ventilated and in my patents I have shown the back of the jacket or condensation-receiver fenestrated or provided with large openings. In my Patent No. 869,953 of Nov. 5, 1907, I have shown devices applied to the back of the jacket for holding it away from the wall. The tank herein shown, and as particularly illustrated in Fig. 6, is provided with two fenestrums or large openings P, instead of a single one, and these openings are surrounded by flanges *p* which, however, are partially cut away as illustrated at *p'* to permit the free passage of air.

I claim as my invention:

1. A flush-tank associated with a condensation-receiver and having a connection with a closet-bowl for flushing purposes while the condensation-receiver is connected to receive a proper amount of flush-water to be automatically supplied to the bowl after the

flushing operation to provide the required water-seal.

2. The combination with a closet-bowl of a water-tank associated with a condensation-receiver and connections between the tank, the bowl and the condensation-receiver, of such relative areas that part of the flush-water will rise into the condensation-receiver during the flushing operation and then flows therefrom to supply the required amount of water to provide a water-seal in the bowl.

3. A flush-tank associated with a condensation-receiver and having a connection with a closet-bowl for flushing purposes, while the condenser-receiver is connected to receive a part of the flush-water to be automatically supplied to the bowl after the flushing operation and to afford a water-seal, the area of the water-passage leading to and from the condensation-receiver being so regulated as to cause the required amount of water for sealing purposes to pass at each operation.

4. A flush-tank associated with a condensation-receiver and having a connection with a closet-bowl for flushing purposes, a passage connecting the receiver with the connection between the flush-tank and the bowl for conducting flush-water to the condensation-receiver and for conveying it therefrom for sealing purposes, and means for regulating the size of this passage.

In testimony whereof, I have hereunto subscribed my name.

CHARLES WILLMS.

Witnesses:

FRED W. NEW,
CHARLES W. A. NEW.