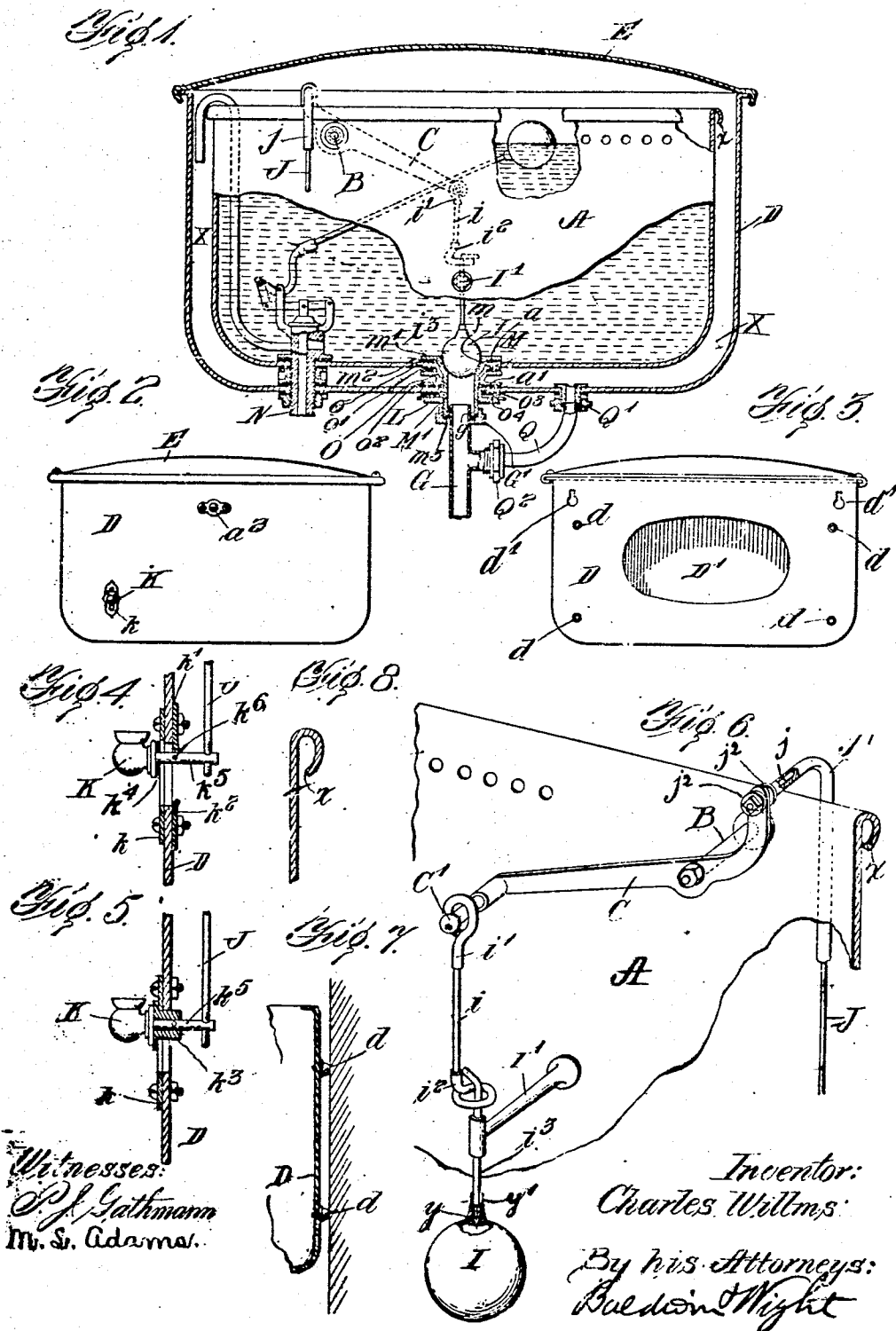


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PATENTED NOV. 5, 1907.

C. WILLMS.
WATER TANK.
APPLICATION FILED SEPT. 5, 1906.



UNITED STATES PATENT OFFICE.

CHARLES WILLMS, OF BALTIMORE, MARYLAND.

WATER-TANK.

No. 869,953.

Specification of Letters Patent.

Patented Nov. 5, 1907.

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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, State of Maryland, have invented certain new and useful improvements in Water-Tanks, of which the following is a specification.

My invention relates especially to water-tanks of the class known as flushing tanks and particularly to tanks of the kind shown in my prior application for patent filed March 13, 1906, in which the tank is formed of thin sheet metal and enameled and which is associated with a condensation collector, also formed of sheet metal and enameled and which received water of condensation dripping from the water-containing tank.

The object of my present invention is to improve certain details of construction of flushing tanks of the kind specified.

My improvements are clearly shown in the accompanying drawings and will be hereinafter fully described.

Figure 1 shows a longitudinal vertical section through a flush tank embodying my improvements with some parts shown in front elevation and some parts broken away to better illustrate other parts. Fig. 2 shows a front elevation of the tank on a smaller scale. Fig. 3 shows a rear elevation thereof. Fig. 4 is a detail view of the flush valve operating handle and certain parts associated therewith. Fig. 5 is a similar view of a modification. Fig. 6 is a detail view in perspective and on an enlarged scale of the devices employed for operating the flush valve. Fig. 7 is a detail view in section illustrating the manner in which the tank is held away from the wall to which it is applied. Fig. 8 is a detail view of the rim of the water-containing tank.

The general organization is similar to that shown in my application for patent above mentioned.

The water-containing tank, A, is associated with a condensation collector, D, in this instance shown as consisting of a jacket surrounding the tank and provided with a removable cover, E. There is an air-space, X, between the tank and the condensation collector, which latter is provided at the rear with an opening or fenestrum, D', to permit the free access of air to the space, X. The tank may be applied to a wall by hanging it on suitable supports which may engage the key-hole slots, d'. In order to hold the tank away from the wall so as to permit air to freely circulate and to enter or pass out from this fenestrum, I provide buffers, g, preferably of rubber and applied in the manner shown in Figs. 3 and 7. By thus providing for a free circulation of air, the condensation collector is prevented from becoming as cold as the tank and the accumulation of moisture on the exterior of the collector is avoided.

The water tank, A, is provided in its bottom with a discharge opening, a, communicating with the flush-

pipe, G. In this opening is arranged a valve-seat, M, having an annular inclined valve-receiving portion, m, from the upper edge of which projects laterally an annular flange, m', between which and the inside of the bottom of the tank is arranged a soft washer, m². From the lower end of the inclined portion, m', extends downwardly a threaded projection, M', which it will be observed is smaller in diameter than the valve-receiving portion, m, and extends through an opening, a', in the bottom of the condensation collector which is smaller in diameter than the opening, a. At its lower end, the projection, M', is formed with an inwardly projecting annular flange, m³. These valve-seats can be formed by first cutting seamless tubing into suitable lengths and then drawing these lengths into the required shape. By so doing, the valve-seat may be made lighter than if made of cast metal, having the same strength and I find it easier to cut threads on such sheet metal seats because there is not so much wear on the cutting tools. Furthermore, valve seats made in this way are more uniform than when cast.

The valve-seat as shown in Fig. 1, projects below the bottom of the tank while the flange, m' lies close to the bottom. In this way the accumulation of any considerable amount of sediment in the tank is avoided. The bore of the valve-seat is somewhat funnel-shaped. There is no obstruction to the free flow of flush water which will pass through the seat with great force. In attaching the valve-seat, the washer, m² is first placed on it and then the projection M' is passed through the opening, a, before the tank, A, is placed within the condensation collector, then a soft washer, o, and a metallic washer, o', are applied. Then a nut, O, is screwed on to the projection, M', thus clamping the valve-seat to the tank, A. After this, a soft washer, o² is applied and then the tank is placed within the condensation collector, the projection, M' being made to pass through the opening, a. Then a soft washer, o³, and a metal washer, o⁴, are applied and then a clamping nut, L, is employed to clamp the valve-seat to the condensation collector. The nut, O, is of such size as to act as a spacing device to hold the tank and collector a suitable distance apart. The devices described therefore serve to firmly clamp the valve-seat to the tank and to the condensation collector and to hold the collector and tank a suitable distance apart to provide the air space before mentioned. The flush-pipe, G, extends into the downward projection, M' of the valve-seat. In order to couple it thereto and prevent leakage, I employ a coupling nut, G', which contains a soft washer, g. When the nut G' is screwed home, the washer, g, is compressed against the inwardly projecting end of the flush-pipe, a sufficiently tight connection is established and leakage is prevented. The flush-pipe is connected with the condensation collector by means of

a branch pipe, Q, provided with coupling devices, Q' and Q², of the kind described in my application for patent before mentioned.

The inlet valve and its attaching devices, X, are also similar to those heretofore employed by me and need not be here specifically described.

The flush-valve, I, is in this instance a rubber ball and it is provided with a stem, I², extending through a guide, I', attached to the front side of the tank. The lower end of the stem screws into a metallic socket piece, y, in the ball and in order to prevent this metal socket piece from striking the guide, I', I provide a cushion device, y'. This device may consist of a small section of rubber tubing strung on to the stem, I² and resting on the top of the socket piece, y. As the valve is moved up and down, the cushion, y', will strike the guide, I', but it will not make an objectionable noise. The guide, I', also acts as a stop limiting the upward movement of the valve I.

The valve-operating lever, C, is pivoted on a bracket, B, projecting from the front side of the tank and it has a rearwardly projecting arm, C', to which is connected a rod, i, in turn connected with the valve stem, I². The connecting rod, i, is formed with a loop at each end where it connects with the arm, C', and with the valve stem. This affords a loose connection, enabling the flush valve to be operated easily and without strain. In order, however, to deaden or muffle the sound, which would be caused by the vibration of these parts, I apply some sound muffling or deadening material, i', i², to the loops, preferably the material employed is rubber.

The valve-operating lever, C, is connected with a vertical rod, J, having at the top a rearwardly extending arm, j. Sound deadening washers, J², are arranged on the arm, j, on opposite sides of the short arm of the lever, C, so that while the connection between the arm and the lever may be a loose one, the tendency of making a noise by the vibration of the parts will be so reduced as to be unobjectionable. The rod, J, extends down between the front of the water-containing tank and the condensation collector. The arm, j, at the top of the rod, J, extends across the front edge of the tank and is covered with sound deadening material, j', preferably rubber, so that when the arm of the rod comes into contact with the tank, the tendency to produce a noise is avoided or reduced to such an extent as to be unobjectionable.

At its lower end, the rod, J, is connected with the flush-valve operating handle, K, in the manner shown in Fig. 4. This handle extends through a slot in the front side of the condensation collector and around this slot is arranged an ornamental finishing plate, k. In Fig. 4, a washer, k¹, of some soft material is placed on the shank, k², of the handle in front of the plate, k, and a transverse pin, k³, is applied to the shank, k², in rear of the front wall of the condensation collector to keep the handle in proper position. Sound muffling or deadening cushions, k', k², are secured in place at the upper and lower ends of the slot. By those devices, as the valve-operating handle, K, is moved up and down, it is prevented from coming directly in contact with metal and so any objectionable noise which might otherwise be caused by the operation of the handle is prevented.

Instead of providing the devices shown in Fig. 4 for muffling or deadening the sound, I may employ the device, k³, shown in Fig. 5. This consists of the flanged sleeve applied to the shank, k², which fits the slot loosely, the flange being arranged to bear on the front of the plate, k.

The buffer, a², shown in Fig. 2, is a device usually employed on low down tanks against which the lid of the seat abuts.

It will be observed that my improvements are especially useful in connection with a flush tank made entirely of sheet metal. If the tank were made partly of wood, there would not be so much necessity for deadening the sound, but where the water-containing tank is surrounded by a jacket of sheet metal and there is an air-space between the tank and the jacket, there is a tendency to produce objectionable noises when the valve mechanism is being operated, but by my improvements such objectionable noises are eliminated.

I have heretofore found some difficulty in properly enameling the rim of the tank. Where the rim was formed by turning over the upper edge of the tank and bringing the turned over portion down straight parallel with the sides of the tank, the enamel would not always adhere perfectly to the extreme edge of the rim. By my present improvements, I turn the edge of the rim inwards slightly, as indicated at x in Figs. 7 and 8. This serves to cause the enamel to adhere while being baked to all portions of the rim, including the extreme edge and thus imperfect enameling is entirely prevented.

In practice I find that air passes up from the seat through the flush pipe, G, and through the branch pipe, Q, to the space between the condensation collector and the water tank and passes out through the fenestrum, D'. By the construction shown, air is made to freely circulate in the manner specified all around the water tank and to pass out through the fenestrum and then out through the space between the fenestrum and the wall provided by the buffers, d. While I prefer to use the buffers, d, other means may be employed for separating the jacket from the wall.

I claim as my invention:

1. The combination of a water tank having a discharge opening in its bottom, a condensation collector associated with the tank and having an opening in line with the discharge opening thereof, a valve-seat having its valve-receiving portion extending below the bottom of the tank and having a laterally projecting flange at its upper end surrounding the opening in the tank a nut for clamping the valve seat to the bottom of the tank, said valve-seat being formed with a threaded projection extending through the opening in the condensation collector, a nut for clamping said projection to the condensation collector, a flush-pipe extending into said projection and means for detachably coupling the flush-pipe thereto.

2. The combination of a water tank having a discharge opening in its bottom, a condensation collector associated with the tank and having an opening in line with the discharge opening thereof, a drawn metal valve-seat applied to the tank at its discharge opening, having a tapered or inclined valve-receiving portion extending below the bottom of the tank formed with a flange surrounding the discharge opening of the tank and with a threaded projection extending through the opening in the condensation collector, the lower end of which is formed with an inwardly projecting flange a nut between the condensation collector and the tank for clamping the valve seat to the tank, a nut outside the condensation collector for clamping the valve seat to the condensation collector, a flush-pipe and

means for detachably connecting the lower end of the valve seat with the flush pipe.

3. The combination of a water tank, a condensation collector surrounding it and having an air space between its sides and bottom and the sides and bottom of the tank and which is provided with an opening or fenestrum in its back wall communicating with said air space, a cover closing the top of the condensation collector and buffers on the back of the condensation collector surrounding the fenestrum for holding the collector away from the wall to which it is applied to permit air to freely pass to or out of the air space surrounding the tank.

4. The combination of a water-containing tank, a condensation collector associated therewith and having an air space between its bottom and the bottom of the tank and also around the tank and which is provided with an open-

ing or fenestrum in its back, a cover closing the top of the condensation collector, means on the back of the condensation collector for holding it away from the wall to which it is applied, a flush pipe connected with the water-containing tank, and a branch pipe connecting the flush pipe with the condensation collector, the arrangement being such that air will be made to pass from the flush pipe into the condensation collector and thence outwards through the fenestrum.

In testimony whereof, I have hereunto subscribed my name.

CHARLES WILLMS.

Witnesses:

VICTOR H. EDWARDS,
CHAS. WILLMS, JR.