Jan. 19, 1960 S. E. KIVELA 2,921,319

DRIP TRAY FOR TOILET TANK

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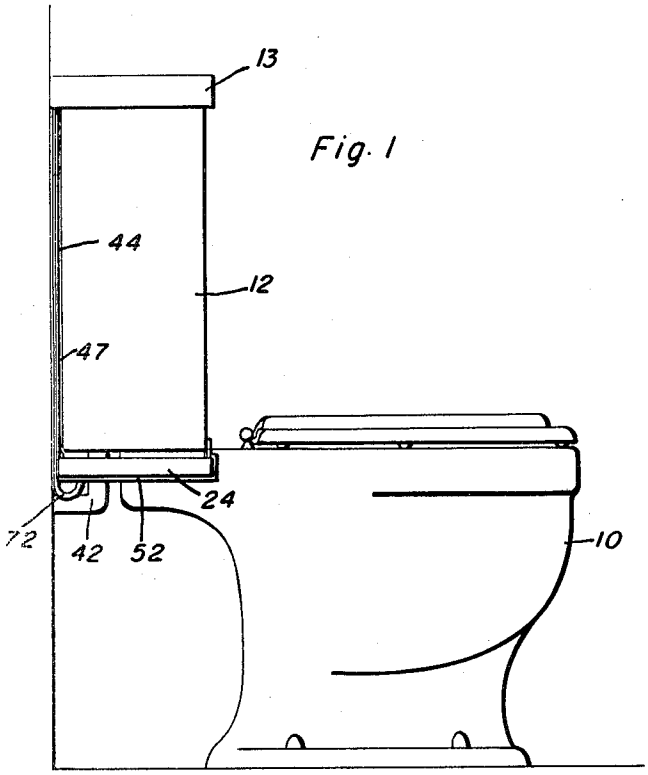


Fig. 1

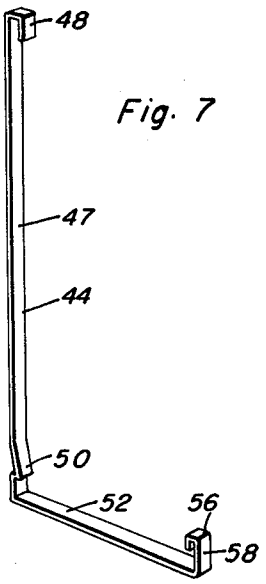


Fig. 7

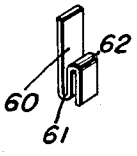


Fig. 8

Fig. 5

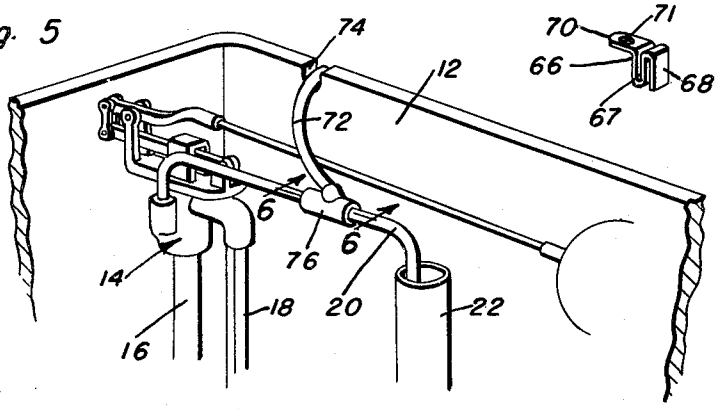
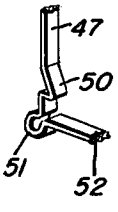


Fig. 9

Fig. 11



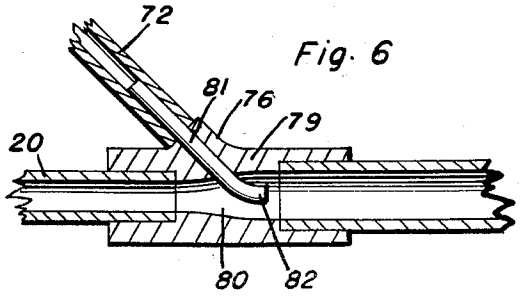


Fig. 6

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Fig. 2

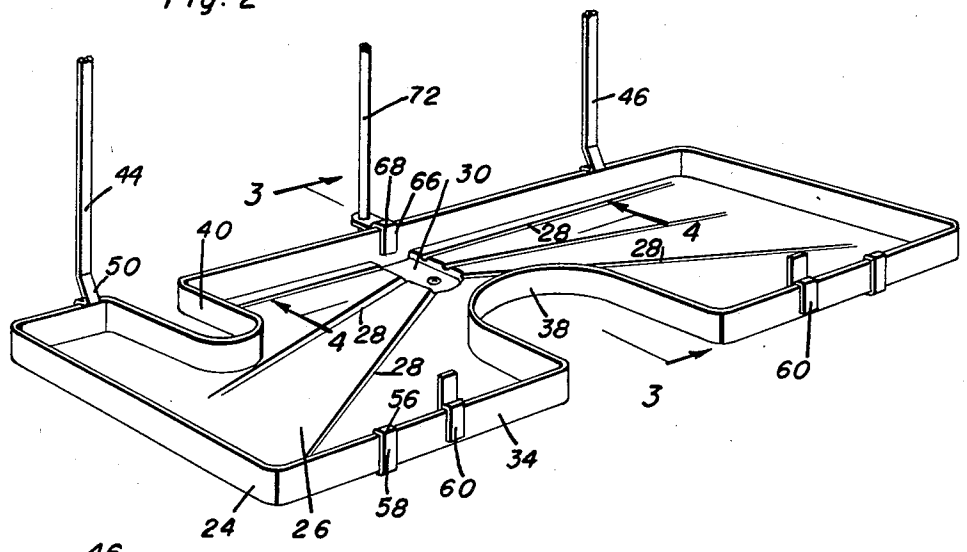


Fig. 3

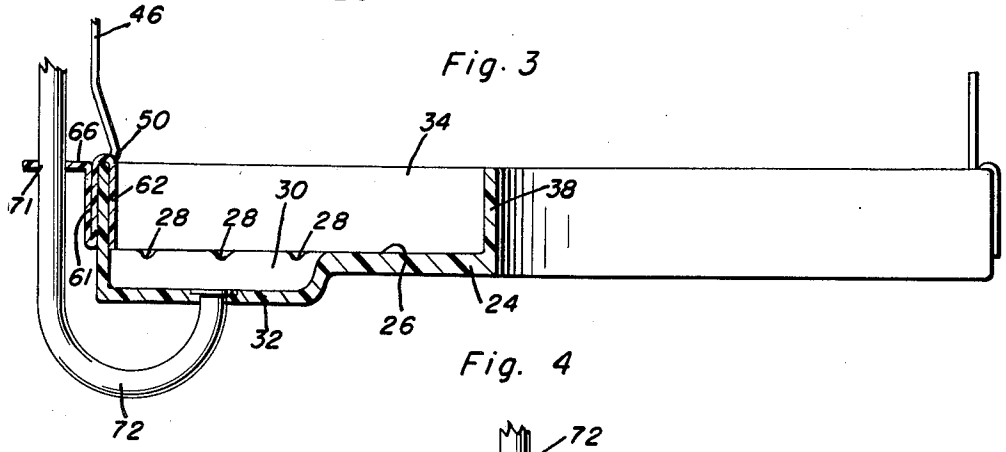


Fig. 4

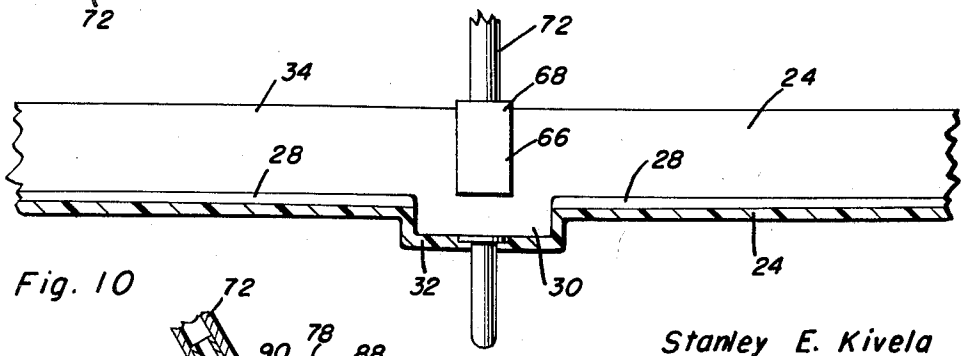
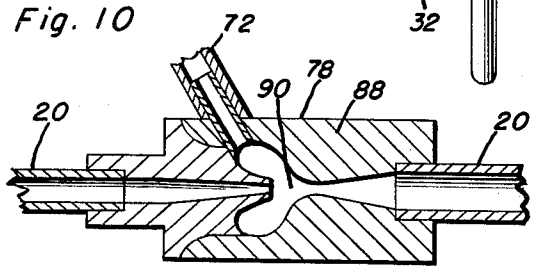


Fig. 10



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United States Patent Office 2,921,319
Patented Jan. 19, 1960

2,921,319

DRIP TRAY FOR TOILET TANK

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Application August 6, 1957, Serial No. 676,596
9 Claims. (Cl. 4—10)

This invention relates to a drip tray for a water closet tank and more particularly to a tray which collects the liquid condensate from a water closet tank and returns it to the overflow tube of the toilet or flush tank mechanism.

Water condenses on the exterior of water closet tanks and causes an appreciable problem in that the condensate drips on the floor. An object of this invention is to provide a tray for the collection of such condensate and to have means connected with the tray that operate automatically for the emptying of the tray. This automatic operation takes place each time that the toilet flush mechanism is operated, at which the refill water, either passing through the refill tube or passing through the supply pipe into the toilet tank, provides the motive force for drawing the condensate from the tray into the toilet flush tank.

A further object of the invention is to provide an attachment for a toilet flush tank which has a tray conforming generally to the shape of the toilet and flush tank, and which has a novel configuration providing a sump for the collection of water that is subsequently discharged into the flush tank, and having a handy and easily operated structure for clamping the tray onto the toilet flush tank.

Other objects and features of importance such as mechanical simplicity and commercial practicability of the invention, will become apparent in following the description of the illustrated form of the invention.

Figure 1 is an elevational view of a standard toilet and flush tank, the flush tank provided with an attachment constructed in accordance with the invention;

Figure 2 is a perspective view of the tray in addition to a part of the clamping means to hold the tray mounted beneath the flush tank of Figure 1;

Figure 3 is an enlarged transverse sectional view taken on the line 3—3 of Figure 2;

Figure 4 is an enlarged sectional view taken on the line 4—4 of Figure 2;

Figure 5 is a fragmentary perspective view showing a part of the flush mechanism in the flush tank and showing the aspirator for drawing liquid condensate from the tray of Figure 2;

Figure 6 is a longitudinal sectional view of an aspirator used in connection with and constituting a part of the invention;

Figure 7 is a perspective view of one of the clamps of the invention;

Figure 8 is another clamp;

Figure 9 is an additional clamp;

Figure 10 is a longitudinal sectional view of another aspirator which can be used in place of the aspirator of Figure 6, Figure 10 and Figure 6 illustrating that various changes may be made in the structure without departing from the principles of the invention; and

Figure 11 is a fragmentary view of a modification of the clamp in Figure 9.

In the accompanying drawings there is an ordinary

toilet bowl **10** and flush tank **12**. These are operatively connected in the usual manner and represent either the unit closet where the toilet has the tank mounted on the bowl or the separate bowl and tank assembly. Flush mechanism **14** is in the flush tank and among the other structures of mechanism **14** are water supply pipe **16**, tank supply pipe **18** which extends from the valve of mechanism **14**, and the bowl refill water supply pipe **20** directed into the overflow tube **22**. Pipe **16** is the water inflow conductor for the valve, while pipes **18** and **20** are water outflow conductors for the same valve. The normal operation of the flush mechanism **14** is unaltered by the presence of the invention.

Tray **24** is shown as a one-piece plastic construction, although other materials of construction may be adopted. For example, enameled aluminum, stainless steel or chrome plated metal would make an excellent choice of materials for hospital use. Tray **24** has a bottom **26** formed with upwardly opening channels **28** leading to and tapering downward toward sump **30** that is formed by a pocket **32** in the rear center part of the tray **24**. An upstanding side wall **34** extends completely around the edge of the bottom **26** and is used for retaining certain clamps and brackets enabling a quick attachment and disconnection of the tray to the flush tank **12**.

There are various models of toilet bowls and tanks and therefore, the shape and size of tray **24** will vary to conform to the various sizes and styles as well as manufacturer's make of plumbing fixture. Or, the tray may be made of an average composite shape to fit all popular fixtures. In the illustrated form of the invention there is a forwardly opening recess **38** at the front center of the tray to accommodate the rear protrusion of toilet bowl **10**. The recessed part of the tray may have a special brace (not shown) beneath it and resting on the fixture, but this is an optional feature. There is a rearwardly opening recess **40** constructed like the recess **38** but of a different size and in order to accommodate the water supply pipe **42** that depends from the bottom of the particular make of flush tank **12** that is shown in the drawing. Each recess is formed by having a part of the side wall **34** shaped to form it.

Tray **24** is held in place on the flush tank by two clamps **44** and **46**, each identical in construction (Figure 7 or 11). The clamp **44** is made of an elongate flat strip that has a downwardly opening hook **48** at its upper end to engage over the upper edge of the tank **12** beneath its cover **13**. An angular offset **50** is formed near the lower end of the elongated strip **47** of clamp **44** and cooperates with the lateral leg **52** that is at approximate right angles to the elongate strip **47** in order to form a seat within which the tray **24** is accommodated. The offset **50** forms a spring latch for the rear part of the side wall of tray **24**, and it also carries condensate down the strip into the tray. For greater strength, loop **51** (Figure 11) may be formed at the junction of strip **47** and leg **52**. The front part of the tray is gripped by the downwardly opening hook **54** on the short upstanding leg **58** at the outer extremity of leg **52**. Leg **52** is arranged to extend transversely beneath the bottom **26** of the tray (Figure 2) and the clamp **46** engages the tray in an identical manner but near the opposite end of the tray.

Clamp **60** (Figure 8) consists of a flat strip with two U-shaped reverse bends **61** and **62** forming a downwardly opening pocket within which the side wall **34** is fitted (Figure 2). The upstanding part of the clamp **60** contacts a small area of the front surface of flush tank **12** and helps to keep the flush tank fastened firmly in place and centered.

Clamp **66** is made very similar to clamp **60** involving two reverse bends **67** and **68**. The downwardly opening pocket formed by reverse bend **68** is fitted over the

back center part of the side wall **34**, while the opposite end of the clamp **66** protrudes laterally as a flat ear **70** in which there is a hole **71**. Flexible tubing **72** extends through the hole **71** and is attached to an opening at the bottom of sump **32** to conduct water from the sump and into the flush tank **12**. Therefore the tube **72** extends into the flush tank and for this purpose there may be a notch **74** formed in the upper edge of the tank and below its cover **13**. The end of tube **72** is operatively connected with an aspirator **76** or an aspirator **78**, either being operable to serve the intended function of drawing a vacuum in tube **72** which will withdraw all the water from sump **30** and elevate it for deposit into the flush tank **12**. Aspirator **76** is made of a body **79**. The body has a venturi **80** within which the short length of tubing **81** proceeds. The nozzle **82** at the end of tubing **81** faces the direction of travel of water through venturi **80**, and the opposite end of the tubing **81** provides a part of a coupling by which to connect the tubing **72**. As shown in Figure 5 aspirator **76** is interposed in the line **20** extending from the valve and discharging into the tube **22**. Therefore the ends of the body **79** are shaped to receive and hold the spaced confronting ends of the parts of the line **20**. It is to be understood that the aspirator need not be in line **20** but may be in line **18** or some other water conducting line.

Reference to Figure 10 shows that aspirator **78** is constructed somewhat in the same manner as the aspirator of Figure 6. However, body **88** of aspirator **78** is formed with a more sophisticated venturi **90**, which is more effective. Here too, the aspirator may be interposed in line **20** or some other water conductor.

In operation, every time that the flush tank mechanism is operated, there is a corresponding operation of the means for withdrawing water from the tray **24**. This is accomplished by the water rushing through the venturi **80** or the venturi **90** and drawing a vacuum through tube **72** which is connected as described, namely, to the sump **30**.

Tray **26** is constructed in a manner to be reasonably unobtrusive when applied to a toilet flush tank but yet, in a manner that it is capable of collecting all of the moisture which drips from the flush tank **12**, particularly in the summer months. After collecting, the moisture will flow toward the lower area of the tray **24**, namely sump **30**.

It is understood that various changes may be made in the invention without departing from the scope of the following claims.

What is claimed as new is as follows:

1. An attachment for the flush tank of a toilet assembly having a water inflow valve, an inflow water conductor connected to the valve, and an outflow conductor connected to the valve, said attachment comprising a tray located beneath said flush tank and extending at least to the outer lower edges of the tank, clamps attached to said tray and having means by which to hook over the upper edge of the flush tank, said tray having a sump within which to accumulate liquid condensate that drips from the toilet flush tank, a tube connected at one end to said sump, an aspirator operatively connected with said outflow conductor and operated by the water passing through the outflow conductor, said aspirator having a venturi, and means connecting the opposite end of said tube with said venturi to draw a vacuum in said tube and sump from said venturi.

2. The attachment of claim 1 wherein said tray has a bottom, a pocket in said bottom and constituting said sump, a side wall extending around and rising upwardly from the outer edges of said bottom of said tray bottom, said clamps including strips, legs protruding from said strips at approximately right angles to the strips and underlying the tray bottom, and means at the ends of said legs and in said strips for latching and holding said tray in a fixed position.

3. The attachment of claim 2 wherein there are additional clamps on the side wall of said tray and contacting a surface of the tank to further hold the tray steady in a fixed position beneath the tank.

4. In a toilet flush tank which is subject to accumulation of water condensate and which has water inflow means connected therewith, said inflow means including a valve and an outflow conductor connected with the valve, a condensate collection attachment comprising a tray having a bottom and a wall along the edge thereof, a sump in said bottom, a tube connected to said sump to withdraw liquid from said sump, and means connected with said outflow conductor and responsive to the passing of water therethrough for applying a suction to said tube and thereby withdrawing liquid from said sump.

5. In a toilet flush tank which is subject to accumulation of water condensate and which has a water inflow valve connected therewith together with a water outflow conductor attached to the valve, a condensate collection attachment comprising a tray which has a bottom and a wall along the outer edges thereof, a sump in said bottom, a tube connected to said sump to withdraw liquid from said sump, means operatively connected with said outflow conductor and responsive to the passing of water therethrough for applying suction to said tube and thereby withdrawing liquid from said sump, said suction applying means including an aspirator which is operatively connected with said outflow conductor, and means for holding the tray beneath the flush tank.

6. The attachment of claim 5 wherein said means for holding the tray beneath the flush tank include at least one clamp attached to said tray, and said tray having a recess therein by which to accommodate and conform to a part of the flush tank assembly.

7. A new article of manufacture comprising an attachment for a flush tank to collect condensate which drips from the tank and wherein the tank has a water inflow pipe, a valve connected with the water inflow pipe, and a valve outflow pipe connected with the valve, said attachment including a tray having a bottom and a side wall rising upwardly from said bottom, a sump in said tray and within which to accumulate liquid condensate from the tank and which falls into said tray, a tube extending from said sump and communicating with the interior of said sump, means responsive to the flowing of water through said valve outflow pipe for withdrawing the liquid from the sump to said tube, and clamp means attached to said tray and adapted to connect with said tank for holding said tray in position beneath the tank.

8. A new article of manufacture comprising an attachment for a flush tank to collect condensate which drips from the tank and wherein the tank has a water inflow pipe, a valve connected with the water inflow pipe, and a valve outflow pipe connected with the valve, said attachment including a tray having a bottom and a side wall rising upwardly from said bottom, a sump in said tray and within which to accumulate liquid condensate from the tank and which falls into said tray, a tube extending from said sump and communicating with the interior of said sump, means responsive to the flowing of water through said valve outflow pipe for withdrawing the liquid from the sump to said tube, clamp means attached to said tray and adapted to connect with said tank for holding said tray in position beneath the tank, said clamp means including a plurality of clamps, a first of said clamps attached to the upper edge of the tank and fitting in part beneath the tray, and a second of said clamps attached to said tray and operatively connected with another part of the flush tank.

9. In combination; a water inflow valve having a valve outflow pipe, a toilet flush tank serviced by said pipe, a drip tray having an opening in the bottom thereof and a condensate water conductor attached in registry with said opening, means mounting said tray beneath said tank to

collect the moisture condensate which accumulates on and drops from the exterior of said tank, an aspirator connected with said valve outflow pipe on the downstream side of said valve and connected with said conductor for drawing a vacuum in said conductor in response to the flow of water through said valve outflow pipe and thereby withdrawing the accumulated liquid from said tray.

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