Dec. 13, 1960 C. M. CARTER 2,963,710

FLUSH TANK CONTROLS

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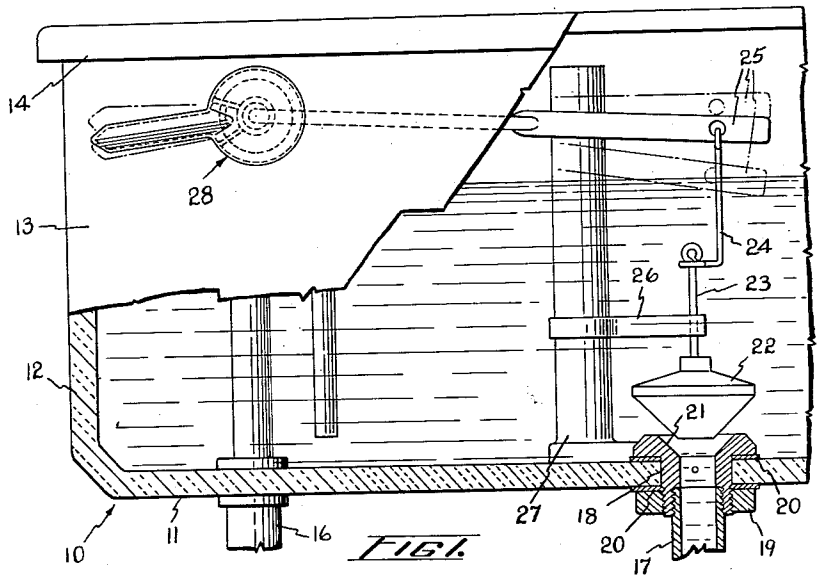


FIG. 1.

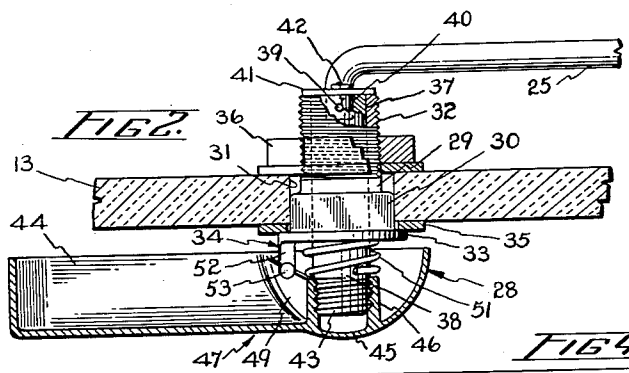


FIG. 2.

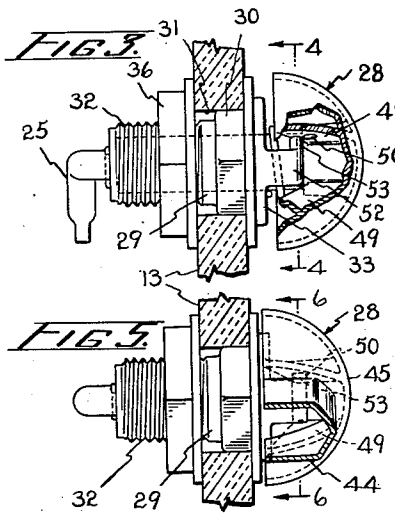


FIG. 3.

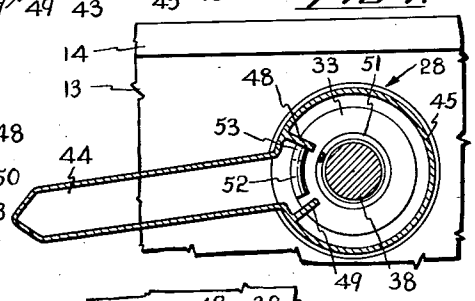


FIG. 4.

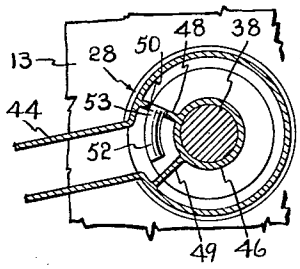


FIG. 6.

INVENTOR
CECIL MORDEN CARTER
BY
Maybee & Legris
ATTORNEYS

United States Patent Office

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FLUSH TANK CONTROLS

Cecil Morden Carter, 230 Park Ave., Newmarket, Ontario, Canada

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5 Claims. (Cl. 4—67)

This invention relates to a control for a flush tank of a toilet. The invention relates more particularly to a control which is operable either to allow discharge of the complete contents of the flush tank into the toilet or to allow discharge of only part of the contents of the tank into the toilet. Such an arrangement finds utility where water is scarce and/or where septic tanks are in use.

It is an object of the invention to provide an extremely simple control which may be fitted to existing flush tanks in place of a conventional control without requiring modification of the tank or valve structure.

Various proposals have been made for dual flush controls in the past but the majority of these have required either modification of the flush tank or a complicated system of dual valves within the tank. The present invention uses the valve system conventionally installed in the tank and does not require modification of the conventional tank structure.

The invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a front elevation, partly broken away, of a flush tank incorporating the control according to the invention,

Figure 2 is a horizontal section through the control of Figure 1 with parts thereof in their first positions,

Figure 3 is a vertical section of the control of Figure 2 with parts thereof in their first positions,

Figure 4 is a section on the line 4—4 of Figure 3,

Figure 5 is a view similar to Figure 3 but showing parts of the control in their second positions and

Figure 6 is a section on the line 6—6 of Figure 5.

Referring now to Figure 1, a flush tank is indicated generally at **10** and has a bottom **11**, side walls **12**, a front wall **13** and a lid **14**. A water inlet pipe **16** is provided and the inlet of water is controlled by a conventional ball valve, not shown. An outlet pipe **17** leads to the bowl of the toilet and is secured in the bottom wall **11** by means of a sleeve **18** and a nut **19**. Washers **20** are interposed between the sleeve and the bottom wall **11** and between the nut **19** and the wall **11** to provide watertight joints. The upper end of the sleeve **18** is flanged and is provided with a conical valve seat **21**. A conical valve **22** of conventional design is arranged to co-act with the valve seat **21** and is operated by a pair of rods **23**, **24** and an arm **25** in conventional fashion. The rod **23** is journalled in a bracket **26** secured to an overflow pipe **27**. The arm **25** is operated by a flush tank control indicated generally at **28**.

Referring now to Figure 2, the flush tank control **28** comprises a sleeve member **29** having a squared portion **30** which is received in the usual aperture **31** provided in the front wall **13** of the flush tank. The sleeve **29** has a threaded shank portion **32** at its inner end and is provided, at its outer end, with a flange **33** and an abutment indicated generally at **34**. The sleeve member **29** is retained in position by a nut **36** threadably mounted on the shank **32** and a washer **35** is interposed between the flange **33** and the front wall **13** of the flush tank.

Mounted in a bore **37** of the sleeve member **29** is a shaft **38**; the shaft is free to rotate in the bore **37** and also to slide axially therein. One end of the arm **25** is secured to the inner end of the shaft **38** by means of a pin **39**; the inner end of the shaft has a counter-bore **40** to receive the end of the arm **25**. A washer **41** embraces the arm **25** and a cotter pin **42** retains the washer **41** in position; the washer **41** and pin **42** limit movement of the shaft **38** towards the outside of the tank.

The outer end of the shaft **38** is threaded at **43** and receives a handle **44** having a hollow domed portion **45**; the latter includes an internally threaded sleeve **46** which receives the threaded outer end of the shaft **38**. The shaft **38** and handle **44** together constitute a handle member indicated generally at **47**. The domed portion **45** is provided with a pair of spaced radial ribs **48** and **49**, seen best in Figures 3 and 4; the rib **48** has an aperture **50** for a purpose hereinafter to be described. A compression spring **51** is interposed between the flange **33** at the outer end of the sleeve member and the free end of the sleeve **46** and urges the handle member **47** to a first position as shown in Figures 2, 3 and 4, movement of the shaft under the influence of the spring being limited by the washer **41** co-acting with the inner end of the sleeve member **29**.

The abutment **34** at the outer end of the sleeve member **29** includes a projection **52** and a curved arm **53**, seen best in Figures 3 and 4. The curved arm **53** is so dimensioned as to be capable of passing through the aperture **50** in the rib **48** when the aperture is in register with the arm. The handle member **47** may be moved from the position shown in Figures 2, 3 and 4 to the position shown in Figures 5 and 6 by pushing the handle member towards the front wall **13** of the flush tank. In Figures 5 and 6 the handle member **47** is in its second position and the abutment **53** is in register with the aperture **50** and may pass therethrough.

The operation of the control will now be described. In normal flush tanks, when the valve has been raised to a certain extent it is maintained in its raised position by the flow of water across its undersurface. However, if the valve is not raised sufficiently from its seat for the flow across its underside to lift it, once the valve is released it will fall onto its seat and close the outlet pipe. The arrangement provided by the present invention is such that in one position of the control the valve may be raised sufficiently high to be kept open by the flow of water across its underside, as in conventional practice, whereas in the second position the valve may only be raised sufficiently high so that as soon as it is released it will descend onto the valve seat. Thus in the first position of the handle member **47** as shown in Figures 2, 3 and 4, only limited rotational movement of the member is available. As the member **47** is rotated, the end of the curved arm **53** will come into contact with the abutment constituted by the rib **48**, since the arm **53** is out of register with the aperture **50** as shown in Figure 3, and rotation of the handle member and therefore movement of the arm **25** is limited by the co-action of the abutments **53** and **48**. However, if the handle member **47** is now pushed towards the front wall of the flush tank so that the handle member assumes its second position, as shown in Figures 5 and 6, the abutment **53** is in register with the aperture **50** and therefore upon rotation of the handle member the abutment passes through the aperture and so clears the abutment **48** so that the valve **22** may be raised to a position in which flow of water across its underside keeps the valve open. In Figures 5 and 6

the end of the abutment 53 is shown as being received within the aperture 50.

The rotational movement of the shaft 38 permitted when the handle member 47 is in its first position is only sufficient to raise the valve 22 to permit water to flow out without supporting the valve so that as soon as the handle is released the valve will close shutting off a further supply of water. Water will therefore be supplied only so long as the handle is depressed and therefore the amount of water used may be controlled. Conversely, when the handle member 47 is in its second position, the valve 22 may be raised sufficiently high by rotation of the handle so that the water flowing across the underside will keep the valve off its seat until all the water in the tank has been discharged whereby a full flush is obtained as in conventional practice.

It will be seen that the invention provides an extremely simple and efficient dual flush control which may be mounted in existing flush tanks without modification of the tank or valve system being necessary.

It will be understood that the form of the invention herewith shown and described is a preferred example and that various modifications may be carried out without departing from the spirit of the invention or the scope of the appended claims.

What I claim as my invention is:

1. A flush tank control comprising a sleeve member for insertion through the wall of a flush tank and having inner and outer ends; an abutment on the sleeve member adjacent to one of said ends thereof and projecting axially therefrom; a handle member having inner and outer ends and supported within the sleeve member to extend from said one end thereof and to be rotatable and axially slidable relative thereto; an abutment on the handle member adjacent to one of said ends thereof; the abutments on said members being at corresponding ends thereof; the handle member being slidable within the sleeve member between a first axial position, in which the abutments coact during rotation of the handle member in the sleeve member to limit said rotation, and a second axial position in which the abutments pass clear of one another during rotation of the handle member in the sleeve member; means at the inner end of the handle member to receive an arm connected to the valve of the flush tank; and elastic means interposed between the handle member and the sleeve member to urge the handle member to one of said positions.

2. A flush tank control comprising a sleeve member for insertion through the wall of a flush tank and having inner and outer ends; an abutment on the sleeve member adjacent to the outer end thereof and projecting axially therefrom; a handle member having inner and outer ends and supported within the sleeve member to extend from the outer end thereof and to be rotatable and axially slidable relative thereto; an abutment on the handle member adjacent to the outer end thereof; the handle member being slidable within the sleeve member between a first axial position, in which the abutments coact during rotation of the handle member in the sleeve member to limit said rotation, and a second axial position in which the abutments pass clear of one another during rotation of the handle member in the sleeve member; means at the inner end of the handle member to receive an arm connected to the valve of the flush tank; and elastic means interposed between the handle member and the sleeve member to urge the handle member to one of said positions.

3. A flush tank control comprising a sleeve member for insertion through a wall of a flush tank and having inner and outer ends; an abutment on the sleeve member adjacent to the outer end thereof and projecting axially therefrom; a shaft having inner and outer ends and being journalled in the sleeve member to extend from the outer end thereof and to be axially slidable relative thereto; a handle secured to the outer end of the shaft; an abutment on the handle; the shaft being axially slidable within the sleeve member between a first axial position, in which the abutments coact during rotation of the shaft in the sleeve member to limit said rotation, and a second axial position in which the abutments pass clear of one another during rotation of the shaft in the sleeve member; an arm secured to the inner end of the shaft for connection to the valve of the flush tank; and elastic means interposed between the handle and the sleeve to urge the shaft with the associated handle to one of said positions.

4. A flush tank control comprising a sleeve member for insertion through a wall of a flush tank and having inner and outer ends; an abutment on the sleeve member adjacent to the outer end thereof and projecting axially therefrom; a shaft having inner and outer ends and being journalled in the sleeve member to extend from the outer end thereof and to be rotatable and axially slidable relative thereto; a handle secured to the outer end of the shaft; a hollow domed portion on the handle arranged to fit over the outer end of the sleeve member; a rib within said domed portion to provide an abutment; the shaft being axially slidable within the sleeve member between a first axial position, in which the abutments coact during rotation of the shaft in the sleeve member to limit said rotation, and a second axial position in which the abutments pass clear of one another during rotation of the shaft in the sleeve member; an arm secured to the inner end of the shaft for connection to the valve of the flush tank; and elastic means interposed between the handle and the sleeve to urge the shaft with the associated handle to one of said positions.

5. A flush tank control according to claim 4, wherein said rib is provided with an aperture and the abutment adjacent to the outer end of the sleeve member is a curved arm, and wherein when the shaft is in its second position the end portion of the curved arm passes through the aperture during rotation of the handle while in the first position of the shaft the end of the curved arm abuts the rib upon rotation of the shaft.

No references cited.