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W. O. GELHAR

3,121,880

DUAL CONTROL TOILET FLUSHER

Filed Feb. 24, 1959

4 Sheets-Sheet 1

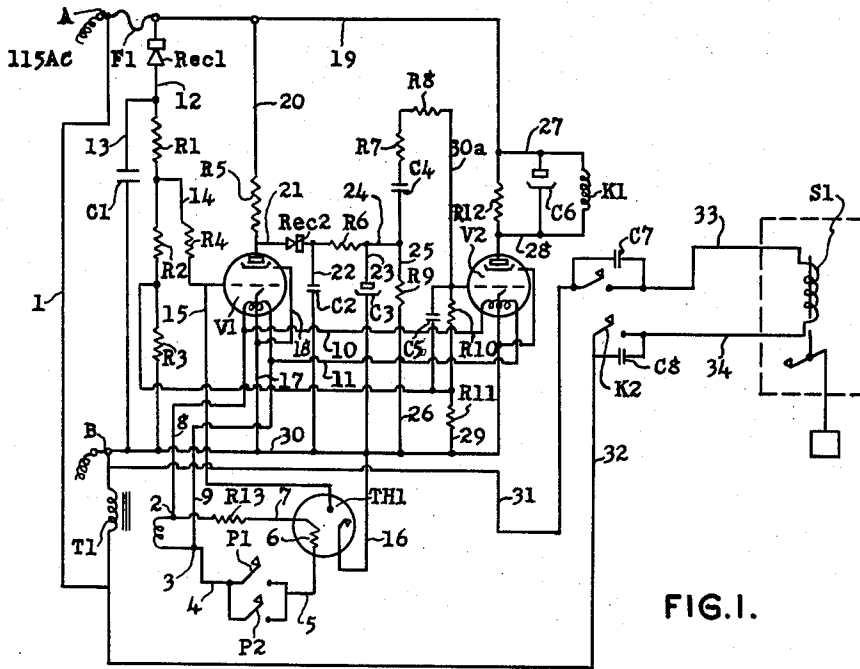


FIG. 1.

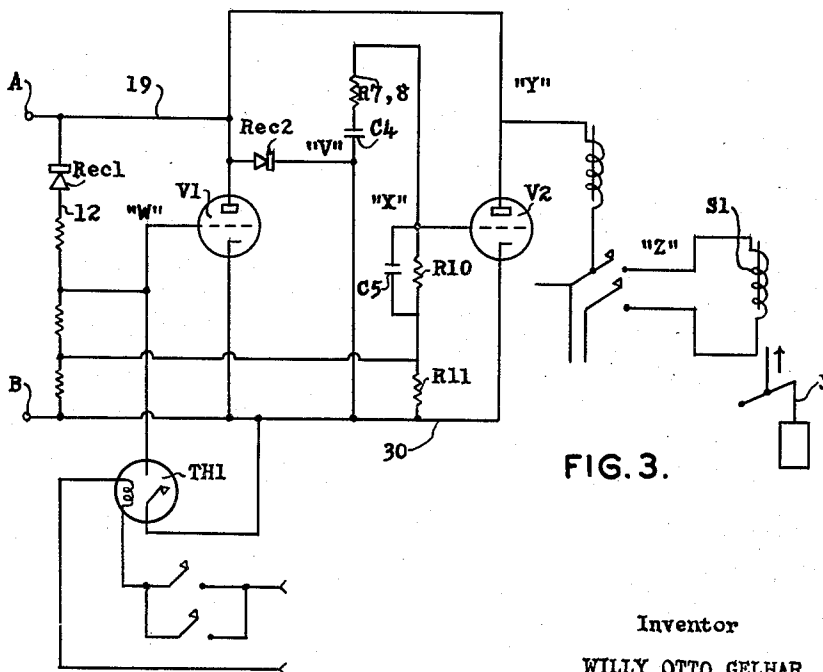


FIG. 3.

Inventor

WILLY OTTO GELHAR

W. Irvin Brackett
Attorney

Feb. 25, 1964

W. O. GELHAR

3,121,880

DUAL CONTROL TOILET FLUSHER

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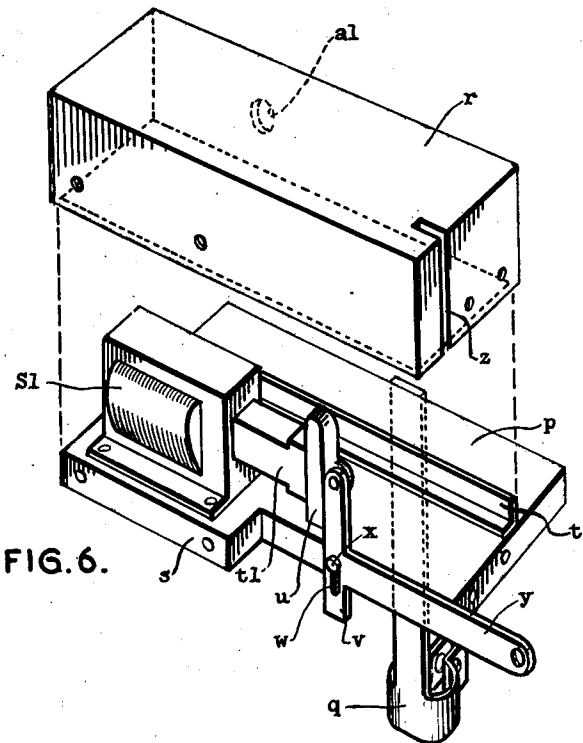


FIG. 6.

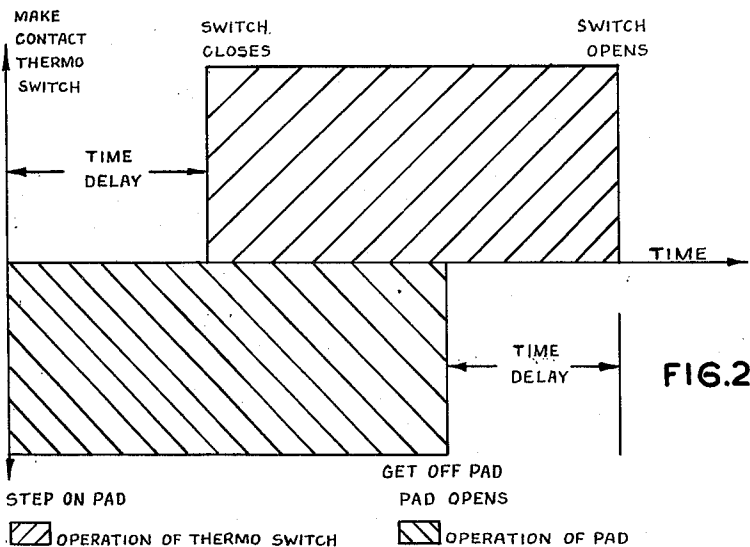


FIG. 2.

Inventor

WILLY OTTO GELHAR

W. O. Gelhar
Attorney

Feb. 25, 1964

W. O. GELHAR

3,121,880

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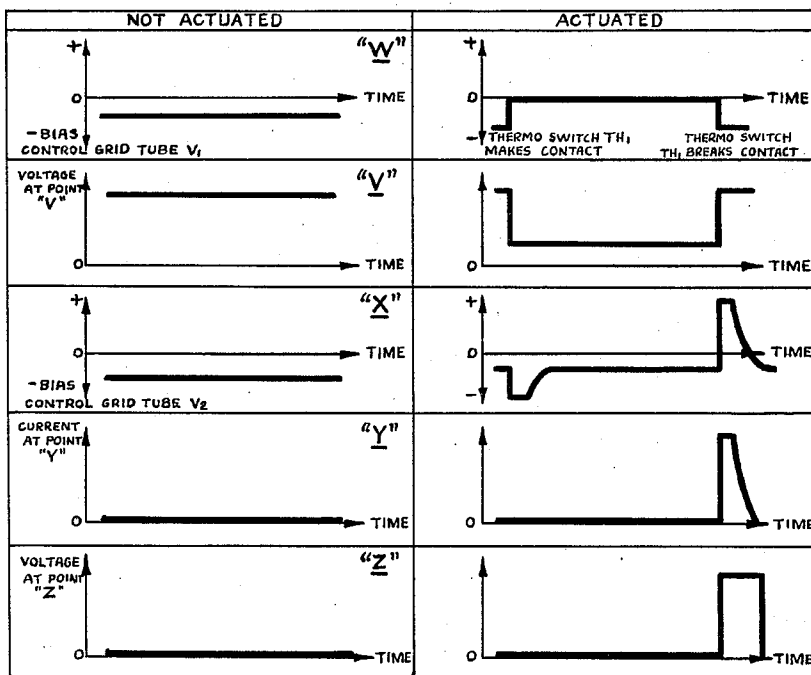


FIG.4.

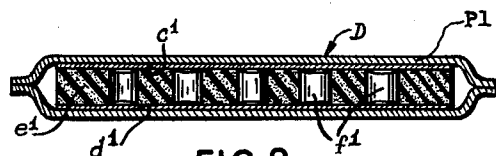


FIG.8.

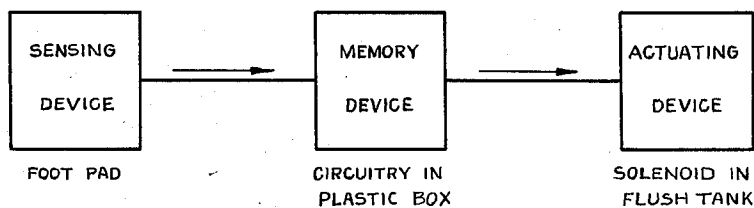


FIG.5.

Inventor

WILLY OTTO GELHAR

W. L. H. H. H. H.
Attorney

Feb. 25, 1964

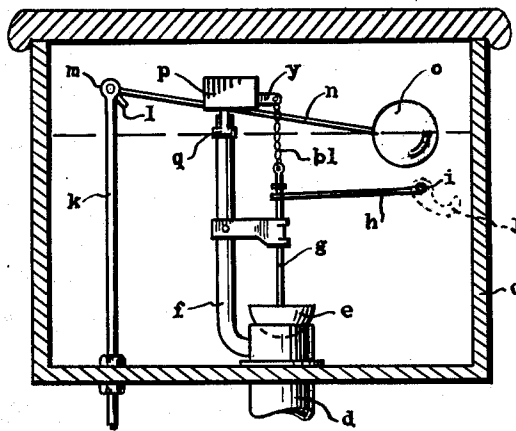
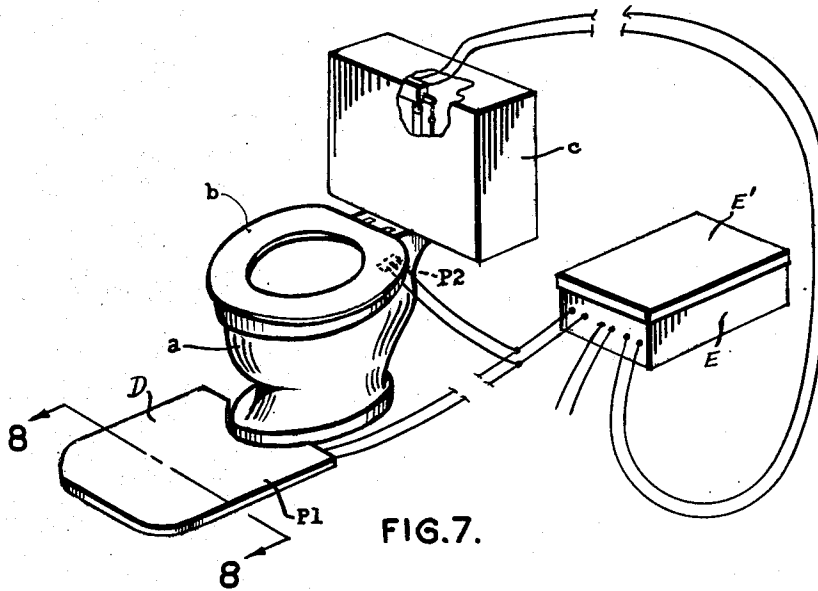
W. O. GELHAR

3,121,880

DUAL CONTROL TOILET FLUSHER

Filed Feb. 24, 1959

4 Sheets-Sheet 4



Inventor

WILLY OTTO GELHAR

W. L. Smith
Attorney

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3,121,880

DUAL CONTROL TOILET FLUSHER

Willy Otto Gelhar, Dorval, Quebec, Canada, assignor of one-half to Palma Adrien Lefebvre and one-half to Leonard Leclair, both of Cornwall, Ontario, Canada
Filed Feb. 24, 1959, Ser. No. 795,176
6 Claims. (Cl. 4-249)

My invention relates to a dual control toilet flusher, that is a flushing device which may be operated electronically and/or manually.

I am aware that electronic toilet flushers have been used in which the operating of the flusher is controlled by an intruder circuit, so that the automatic flushing of the toilet takes place only when a person enters the intruder circuit.

Intruder circuits are very effective when in use, however, they do present some difficulties in their installation, particularly if renovation is being made in the toilet rooms of old buildings and difficulties also occur in installations in new buildings, so that great care must be exercised in such construction.

I have therefore thought it advisable to dispense with an intruder circuit in the present invention, and in lieu thereof to depend on a positive person-control of the operation of the electronic circuit by the person using the toilet.

Some present day electronic controlled toilet flushing systems operate immediately when a person sits on the toilet seat and continues to flush during such use of the toilet. Frequently splashing of the water takes place to the annoyance of the user of the toilet, besides which the volume of water used in this continuous flushing operation becomes excessive. Moreover, the flushing operation ceases only when the user of the toilet rises from the toilet seat.

Consideration has also been given to the fact that when or if electric power should fail, then provision must be made for the manual flushing of the toilet.

In constructing my improved electronic and/or manually controlled toilet flusher, consideration had also to be given to the person using the toilet, that is whether the person is a child or an adult, and since a toilet in private homes is used as a urinal by male members of the household, this entails additional consideration and thought, because while the toilet seat may in one circumstance be used to close the electric circuits operating the toilet flusher, then if the seat is in a lifted position a mat in front of the toilet fixture is utilized to close the electric circuit which controls the automatic flushing mechanism.

The fulfilment of the following objects are necessary to give a successful solution to the problem with which I was confronted.

One of the objects of my electronic controlled toilet flushing apparatus is to provide for its effective and satisfactory operation during use of the toilet by an adult or a child, and to provide electrically controlled means whereby the flushing period will take place after use of the toilet and only when the user has departed from the vicinity of the toilet.

Another object of my invention is to control the time period of the actual flushing operation so that there is no unnecessary consumption of water during the flushing period.

A further object of my invention is to provide a delay control of the electronic flushing mechanism so as to restrain the actual flushing operation during the actual use of the toilet thereby eliminating splashing and other personal discomforts.

Another object of my invention is to adapt my electric flusher to a conventional toilet tank so that if electric

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power fails the toilet may be flushed by the conventional manual lever equipment of the tank.

A further object still of my invention is to provide a moisture free receptacle or casing within the conventional toilet tank and providing a lever which is actuated by a solenoid, the said lever co-acting with the conventional lever in the toilet tank.

Another object still of my invention is to adjustably mount the receptacle or casing on the overflow pipe of the toilet tank in such a manner that the casing will be located and maintained at a level above the high water level in the tank, so precluding the possibility of water entering the receptacle, since the height of the water level in the tank is controlled by the height of the overflow pipe.

Still a further object of my invention is to house or control the electronic operating mechanism in a casing or housing which may be inset in a wall or arranged in other accessible locations in or outside a toilet room to permit of ready inspection or adjustment of the electronic circuits.

Still another object of my invention is to provide a contact switch mounted on the toilet seat and operable when a user sits on the seat, and a second contact switch in the form of a mat arranged in front of the toilet, which is operable when the user of the toilet stands in front of the toilet, both contact switches being arranged in parallel so that the toilet flushing device is operable when either or both of these contact switches is or are closed.

Still a further object of my invention is to so construct my electronic flushing control device that it is enclosed preferably in a sealed container at the point of assembly so that the device is shipped as a unit, intact to the location at which it is to be used and installed, thereby eliminating any assembly adjustment or tampering with the device during shipment or after installation, thereby insuring that the device will meet the high efficient standards required during assembly.

Other objects will be made clear as the specification develops.

So that the nature of my invention will be clearly understood I have illustrated one embodiment of the same which I shall describe in detail, but I wish it to be understood that I do not limit or restrict my invention to the specific description or illustration given below, but reserve the right to modify the same within the scope of my appended claims.

In the drawings:

FIGURE 1 is a diagrammatic layout of one form of the electric circuit used with my electronic controlled flushing device.

FIGURE 2 is a graph showing the delay operation of the switch controlling the flushing of the toilet.

FIGURE 3 is a simplified diagram of the circuit shown in FIGURE 1 with some of the wire connections eliminated for the sake of clarity when describing the function of the circuit.

FIGURE 4 shows a series of graphs relating to the operation of my electronic flusher.

FIGURE 5 is a graph depicting the three operational functions of my electronic flushing system.

FIGURE 6 is an exploded perspective view of the casing with the cover portion thereof removed and elevated above the base of the casing which carries the solenoid, thus showing the horizontal mounting or disposition of the solenoid within the casing.

FIGURE 7 is a diagrammatic view of a toilet fixture and a tank with the electronic mechanism enclosed in a housing and showing the mat actuated switch and the seat operated switch.

FIGURE 8 is a transverse section of the mat actuating switch.

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FIGURE 9 is a vertical section through the toilet tank illustrating the position of the solenoid carrying casing when attached to the tank overflow pipe, and showing a direct flexible member connecting the solenoid actuated bell crank lever with the upper end of the stem of the flush valve of the tank.

Like characters of reference refer to like parts in the several figures.

Referring to the drawings *a* represents a toilet fixture provided with a hinged seat *b* both of which parts are conventional. The under face of the seat co-acts with a pressure contact P2, and in front of the toilet fixture *a* a pressure sensitive pad P1 forms a contact. The pressure contact P2 and the pressure sensitive pad P1 are connected in parallel. They are connected to the wiring of the electronic circuit which controls the automatic operation of the flushing device.

A toilet tank *c* is located adjacent the toilet fixture *a* and an outlet *d* connects the tank with the toilet. This outlet is normally closed by a rubber valve *e* of semi-spherical type, and the outlet *d* adjacent to but below the valve is connected to the lower end of the overflow pipe *f* the upper end of which determines the water level normally in the tank.

Extending upwardly from the valve *e* is a rod *g* which terminates in an enlarged end. A lever *h* is pivotally mounted at one end to a spindle *i* which projects through and is journaled in the front wall of the tank *c*, and the hand lever *j* is rigidly attached to the projecting end of the spindle.

The end of the lever *h* remote from the spindle *i* slidably engages the rod *g*, and on manual actuation of the hand lever *j* unseats the valve *e* to deliver water from the tank *c* to the toilet fixture *a* and so flush the same.

A water inlet pipe *k* extends upwardly through the bottom of the tank *c* and is formed at the upper end with a discharge spout *l*, and a valve *m* controls the delivery of water from the pipe *k* to the spout *l*. The operation of the valve *m* is controlled by a lever *n*, to one end of which a float *o* is attached.

The several parts of the toilet tank so far described are conventional and their operation is well known.

A casing *p* provided with a mounting clamp *q* is attached to the upper end of the overflow pipe *f*, and the clamp is adjustably secured to the pipe so that the casing *p* is held in a selected elevated position above the upper end of the overflow pipe *f* with the lower wall or base of the casing *p* above the normal water level in the tank *c*.

The base *s* of the casing *p* is provided intermediate of its width and on its upper wall with an upwardly disposed angle iron or flange *t*, and the cover *r* of the casing fits on the base *s* and is secured thereto by screws or other suitable securing means. It will be noted by reference to FIGURE 6 that the base *s* projects beyond the back wall of the cover *r*, and it is to this extension of the base that the mounting clamp *q* is attached.

The solenoid S1 is mounted on the base *s* and is horizontally disposed, and the core *r*¹ of the solenoid is provided on its outer end with a vertically disposed arm *u* to which the vertical arm of the bell crank lever *v* is pivotally attached. This bell crank lever is formed with a slot *w* which engages the pin *x* mounted on the base *s* of the casing *p*.

When the bell crank lever *v* is rocked then the horizontal arm *y* of the bell crank is designed to be rocked on the pin *x* so that the arm *y* may be rotated through an arc in a vertical plane.

The arm *y* is designed to move in the cutout or slot *z* in the cover *r* of the casing *p*, and the cover is also provided with an orifice *a*¹ through which a wire cable passes, with one end of the cable connected to the solenoid S1 which is thus included in an electric circuit as will be described hereafter.

The arm *y* of the bell crank *v* is connected by a flexible member *b*¹ to the upper end of the stem *g* of the flush

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valve *e* in the flush tank *c*, and when the solenoid S1 is energized it pulls the core *r*¹ inwardly to rock the bell crank *v* on the pin *x*, and the flexible member *b*¹ exerts an upward pull on the stem *g* of the flush valve *e* to disengage the flush valve from its co-acting valve seat and thus discharge water from the tank *c* to the toilet fixture *a* to flush the fixture.

The operation of the flushing device is controlled by an electronic device such as is shown in FIGURE 1 in which the terminals A and B are connected to a source of electric energy of 115 volts, A.C. and the terminals A is connected by the wire 1 with the transformer T1 which in turn is connected to the terminal B and this circuit is closed at all times.

By induction the current flowing in this circuit is transmitted to the secondary of the transformer T1, and the current is reduced to 6.3 volts across the two connectors 2 and 3.

When the switch P1 is closed, current flows through the wire 4, switch P1, wire 5 to the heating element 6 in the thermostat TH1, through the wire 7, the resistor R13, to the connector 2, the secondary of the transformer T1 and the connector 3, so closing this circuit.

It will be observed that the switch P2 which is in parallel with the switch P1 will when closed also close the above circuit, and the circuit may be closed by either of these two switches individually or by the two switches at the same time.

The connector 2 is connected through the wire 8 with the heater of the thyatron V1, which heater is connected by the wire 9 with the connector 3, and the heater in the thyatron V2 is connected in parallel by the wires 10 and 11 and there is a 6.3 voltage passing through the heaters in the thyatrons V1 and V2 under certain circumstances.

Current at 115 volts A.C. flows from the contact A through the fuse F1, the rectifier Rec. 1, the wires 12 and 13, and the capacitor C1 to the terminal B. Simultaneously current flows through the resistors R1, R2, R3, and wire 30 to the terminal B. A connection is also made through the wire 14 to the resistor R4, and thence to the control grid of the thyatron V1, and between this thyatron and the resistor R4, a wire 15 is connected to one side of the thermostat switch TH1, which is further connected by the wire 16 and wire 30 with the terminal B.

The cathode of the thyatron V1 is connected through the wire 17 and wire 30 with the terminal B, and the screen grid of the thyatron V1 is connected by the wire 18 and through the wire 17 and wire 30 with the terminal B.

The fuse F1 is connected by the wire 19, wire 20, resistor R5 to the plate of the thyatron V1, and in the static condition practically no current flows through the wire 20 and the resistor R5. Part of the A.C. component through the resistor R5, wire 21 and rectifier Rec. 2, is shunted through the wire 22, the capacitor C2 and wire 30 to the terminal B.

The remaining D.C. current as well as the A.C. component flows through the resistor R6, with the balance of the A.C. component bleeding through the wire 23, the capacitor C3, and wire 30 to the terminal B, while the D.C. flows through the wire 24, the wire 25 to the resistor R9, and the wire 26 and wire 30 to the terminal B. Beyond the wire 24 the D.C. is blocked by the capacitor C4.

The voltage of line 19 reaches resistor R12, to the plate of the thyatron V2, and is also impressed on a low pass filter network around the resistor R12, and consists of the capacitor C6, the plate relay K1 and the wires 27 and 28.

The required negative voltage for the control grid of thyatron V2 is through the wire 29, and the resistor R10. The resistor R11 is connected by the wire 29 and the wire 30 to the terminal B. The A.C. path to the control grid

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of the thyatron V2 is from the capacitor C4, the resistor R7, the resistor R8 through the wire 30^a.

The capacitor C5 is in parallel with the resistor R10. The cathode and the screen grid of the thyatron V2 are connected to the wire 30.

The plate relay K1 which includes the double pole single throw switch K2 controls the operation of this switch which normally is in an open position. The capacitors C7 and C8 are associated therewith and act as arc suppressor.

The wire 31 goes from the terminal B to one pole of the switch K2, and the other pole of the switch K2 is connected through the wire 32 and wire 1 with the terminal A.

The contacts of the double pole switch K2 are connected by the wires 33 and 34 with the solenoid S1 which controls the operation of the flushing mechanism of the toilet.

Reference has been made to the energizing of the solenoid S1 which is controlled by the pressure sensitive pad D illustrated in cross section in FIGURE 8, and consists of a pair of spaced layers of flexible wire cloth c¹ and d¹, between which is located a layer of foam rubber e¹ provided with a plurality of orifices f¹ which extend vertically through the layer of foam rubber.

These layers of flexible wire cloth and the foam rubber are enclosed and heat sealed in a plastic mattress, and the layers of flexible wire cloth constitute the pad switch which has been referred to above as P1.

The switch in the thermostat TH1 may be of a bimetallic type which is heated by the element 6 in the thermostat, and consequently this switch forms a delayed action switch.

Tentative System Description

My electronic flusher is an electronic electro-mechanical device, and may be considered as consisting of the following three parts; The "Sensing Device," The "Memory Device," and the "Actuating Device."

The "Sensing Device" is of a non-active variety. No oscillations of any sort are required. The "Sensing" is based on a pressure-operated device (foot pad) relaying information as soon as a person steps on it.

The "Memory Device" accepts electrical information from the "Sensing Devices," stores it for a period of time and causes certain actions when required.

The "Actuating Device" receives electrical information from the "Memory Device." It starts the flushing cycle by electro-mechanical means.

These three steps in the operation of my electronic flusher are diagrammatically illustrated in FIGURE 5.

The delay action of the device is graphically set out in FIGURE 2 in which the first step depicts the time delay of the switch closing, secondly the prolonged period of closure of the switch when the toilet is occupied and no flushing can take place, and thirdly the time delay in opening the switch after the toilet is unoccupied so permitting a flushing of the toilet.

This arrangement of my toilet flusher does not require any adjustment after installation as the whole device is then immediately ready for operation. Low voltage will not cause the device to act, and power failure can be overcome by the manual operation of the flush tank.

Tentative Mechanical Description

The case E with its associated cover houses the circuit shown in FIGURE 1 with the electrical and electro-mechanical components other than the actuator.

The pressure sensitive pad D and the toilet seat interlock and the actuating device in the form of the solenoid S1 with its associated lever system are located externally of the case E.

The case E with its associated cover E¹ is of a plastic material with the circuit components mounted inside the

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case, and this case is designed for easy and ready mounting in or on the wall of a toilet room, or adjacent room.

The pressure sensitive pad D is constructed of a tough vinyl cover enclosing two layers of flexible wire cloth separated by a perforated foam rubber or a plastic material of high resiliency and the pad is actuated even by a minor pressure which causes contact of the layers of flexible wire cloth to give the information to the input of the circuit.

The seat interlock is connected in parallel to and similar in construction to the pressure sensitive floor pad, but is of course miniature in size. A variety of mountings may be used.

From the case E three cables emerge, one for the line supply, one for the control voltage for the actuating device, and one for the pressure sensitive pad.

The actuating device consists of a pull or rotary solenoid S1 with a lever arrangement enclosed in the casing p, (see FIGURE 6), and an adjustable link or flexible connection transmits the generated pull or torque to the flush tank lever mechanism as has been described above.

Operation

When a person either actuates the pressure-sensitive pad (footpad) or the "seat interlock switch," the following operation occurs (see FIGURE 2). The heater element in the thermo-switch TH1 makes contact (see FIGURE 2). This causes the control grid of the thyatron V1 to assume the potential of point B (see FIGURE 3). This means that the control grid has assumed a bias of 0 volts in reference to the cathode of V1 (see "W" actuated, FIGURE 4). The thyatron becomes conducting and plate current will flow. This plate current will cause a voltage drop across the plate load of thyatron V1 (see R5 in FIGURE 1). This, in turn, will cause a negative change in voltage at point "V" referred to point B in FIGURE 3. This voltage being D.C. after passing through the rectifier and low-pass filter network of components Rec. 2, C2, R6, C3 (see FIGURE 4 in actuated "V"). This negative change of the plate voltage of the thyatron V1 is differentiated through network C4, R7 and R8 (FIGURE 1) and appears at the control grid of thyatron V2 (point "X" in FIGURE 3) as a negative impulse (see "X" actuated in FIGURE 4). This negative impulse charges capacitor C5 (FIGURE 1) which in turn causes a higher bias voltage (negative) to be present at the control grid of thyatron V2. This charge leaks off over grid resistors R10 and R11 in general until the normal condition is re-established (acts as protection against operation of the electronic flusher, when a person sits on the seat). The thyatron V2 stays non-conductive and nothing happens at relay K1. (See "Y" and "Z" actuated in FIGURE 4.)

When the person leaves the toilet seat, the following operation occurs (see FIGURE 2).

Operation

The pad opens, causing the 6.3 v. heater supply to be cut off ("Get Off Pad, Pad Opens" FIGURE 2). The stored heat in the thermo-switch TH1 causes the contacts still to make for a certain period of time. This delay enables a person to go away from the flush-bowl without being embarrassed by rushing water of the flushing cycle. After this time delay, the contacts open (see FIGURE 2, Switch Opens). The open contacts allow to establish the original bias at the control grid of thyatron V1, thus causing this thyatron to become non-conductive. (see FIGURE 4, "W" actuated.) The non-conductive state of this thyatron causes the voltage at point "V" (FIGURE 3), to rise to its original potential (see FIGURE 4, "V" actuated). Point "X" (see FIGURE 3) becoming positive means that the thyatron V2 will become conductive, current will flow at point "Y" (see FIGURE 3) (see FIGURE 4, point "Y"). If current

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flows at point "Y" relay K1 will be energized and make contact. Now 115 v. A.C. will appear at point "Z" (see FIGURE 3 and FIGURE 4, "Z" actuated), which will in turn cause the solenoid S1 to be actuated and lift up the valve in the flush tank. The flushing cycle starts. As the impulse at point "X" (FIGURE 3) is only a certain time duration (FIGURE 3) controlled by C5, R10, R11 (FIGURE 1) (time constant), the positive charge at C5 will leak off and establish again the original bias at the control grid of V2 (see FIGURE 4, "X" actuated). This in turn will cause thyatron V2 to become non-conductive, no current will flow at point "Y" (FIGURE 3), this in turn will de-energize relay K1, causing no voltage at point "Z" (FIGURE 3) (see also FIGURE 4, "Y" and "Z" actuated). No voltage at point "Z" will de-energize solenoid S1. The flushing cycle has been started and is now controlled hydraulically by the mechanism in the flush tank.

No interlock is provided for controlling the operation of the device during the "refilling cycle" of the flush tank. Operation of the electronic flusher will only result in no action.

Description of Components and Circuitry

115 v. A.C. line voltage are connected between point A and B. The bias of rectifier "Rec. 1" rectifies the A.C. D.C. voltage with a negative potential at point A. Condenser C1 is a filter condenser filtering out the remaining A.C. component. Resistors R1, R2, R3 between points A1 and B form a voltage divider network. Zero potential occurs at point B. The voltage drop occurring between junction R1, R2 and point B is used for biasing the control grid of thyatron V1 (negative voltage) R4 is an isolation resistor which has the purpose of preventing an excessive current flow when the thermostat TH1 is in operation. The voltage drop between resistors R2 and R3 and point B is used for biasing the control grid of thyatron V2. Resistors R4, R2, R3 form the D.C. grid return for thyatron V1. One contact wire of the thermoswitch TH1 is connected to the control grid of thyatron V1. The other contact side is connected to point B. The heater connections of the thermoswitch TH1 are connected to the filament transformer T1 via the resistor R13 and the "pressure-sensitive pad" and in parallel with it the "seat interlock switch": that means that the "pressure sensitive pad" and the "seat interlock switch" receive something less than 6.3 v. A.C. The filament transformer T1 also supplies 6.3 v. A.C. for the filaments of the thyatrons V1 and V2. R5 represents the plate load for the tube V1. Rec. 2, C2, R6, C3 and R9 form a rectifier with low-pass filter network and bleeder. C4, R7, R8 are a differentiating network. R10 and R11 represent the control grid resistors to give a D.C. voltage path to point B. C5 is the grid capacitor for the control grid of thyatron V2. The cathodes and screen grids of thyatrons V1, and V2 are connected directly to point B. R12 is the load resistor for thyatron V2. Electrolytic condenser C6 in connection with R12 and the coil of relay K1 form a filter network. Condensers C7 and C8 across the contacts of relay K1 are arc-suppressors. Solenoid S1 is the actuator for the valve in the flush tank.

From the above description it will be seen that I have invented a toilet flushing mechanism which is automatically controlled so that the toilet may be used by children or adults, and the flushing operation can only take place after the user of the toilet has risen therefrom and departed from the vicinity of the foot pad controlling the operation of the flushing mechanism.

This toilet flusher also conserves water or eliminates the wastage of water, and the mechanism is so enclosed that it is maintained free from tampering and is always in the same condition and as efficient as when it leaves the assembly factory.

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The actuation of the flushing device is a positive one, and the time delay control prevents any accidental operation of my toilet flushing mechanism.

Having thus described the invention what is claimed as new is:

1. An electronic toilet flusher including a primary electric circuit of relatively high voltage including a pair of thyatrons, a normally open auxiliary circuit of low voltage, a transformer between the two circuits, a thermostat in the auxiliary circuit, means operatively connecting the thermostat in the auxiliary circuit with the thyatrons in the primary circuit, a plate relay in the primary circuit, a double pole throw switch in the primary circuit co-acting with the relay, an electrically actuated solenoid flusher controlling mechanism in the primary circuit and operable after the auxiliary circuit is closed, and switch closure means for the auxiliary circuit actuated when the toilet is occupied.

2. An electronic controlled toilet flusher including a primary circuit of relatively high voltage provided with a pair of thyatrons, a normally open auxiliary circuit of relatively low voltage provided with a thermostat connected to the thyatrons, a transformer between the circuits, a solenoid flusher controlling mechanism in the primary circuit connected with the solenoid, a two pole switch, capacitors in the primary circuit associated with the two pole switch, time delay means in the auxiliary circuit including the thermostat and operable on closing the auxiliary circuit, means connecting the time delay means with the primary circuit, and auxiliary circuit pressure actuated closing means operable when the toilet is occupied.

3. In a toilet flushing mechanism, a manually operable control member co-acting with the flushing mechanism, a first electronic control having a pressure-operated switch, a second electronic control having a pressure-operated switch, said first and second electronic controls having a complementary electric circuit simultaneously and alternatively actuable thereby, said electric circuit co-acting with said flushing mechanism and having delay control mechanism for delayed actuation of said flushing mechanism after a cycle of activation and deactivation of at least one of said electronic controls, each said manually operable control and electronic control being independently operable.

4. In a toilet flushing mechanism; a first electronic control having a pressure-operated switch; a second electronic control having a pressure-operated switch; said first and second electronic controls having a complementary electric circuit simultaneously and alternatively actuable thereby; said electric circuit including a plate relay and associated switch structure, thyatrons, a solenoid connected with said switch structure, means connecting said solenoid with said flushing mechanism for actuation thereof, a normally open low voltage auxiliary circuit in inductive relationship to said electric circuit, and delay control mechanism associated with said auxiliary circuit and connected with said thyatrons for delayed actuation of said flushing mechanism after a cycle of activation and deactivation of at least one of said electronic controls, each said electronic controls being independently operable.

5. In a toilet flushing mechanism; a first electronic control having a pressure-operated switch, a second electronic control having a pressure-operated switch; said first and second electronic controls having a complementary electric circuit simultaneously and alternatively actuable thereby; said electric circuit including a plate relay and associated switch structure operated thereby, at least a pair of thyatrons having heaters, electric responsive means coacting with said flushing mechanism for actuation thereof upon closing of said switch structure, a normally open auxiliary circuit, a transformer between said circuits, a thermostat including a heater in the auxiliary circuit connected in parallel to the heaters of said thyatrons, and delay control mechanism permitting a time

delay heating of said thermostat during activation of at least one of said controls, said electronic controls being independently operable.

6. The combination of a toilet including a bowl, seat and flush mechanism; a first electronic control mounted upon said bowl and having a pressure operated switch activated by pressure upon said seat; a second electronic control disposed adjacent said bowl and having a pressure operated switch activated by pressure adjacent said bowl; said first and second electronic controls having a complementary electric circuit simultaneously and alternatively actuable thereby, said electric circuit coacting with said flushing mechanism and having delay control mechanism for delayed actuation of said flushing mechanism after a cycle of activation and deactivation of at least one of said electronic controls, said electronic controls being independently operable.

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