Nov. 3, 1936. O. E. HEISSER 2,059,733

DEVICE FOR CLEANING DRAIN TRAPS

Original Filed May 17, 1934

Fig. 1.

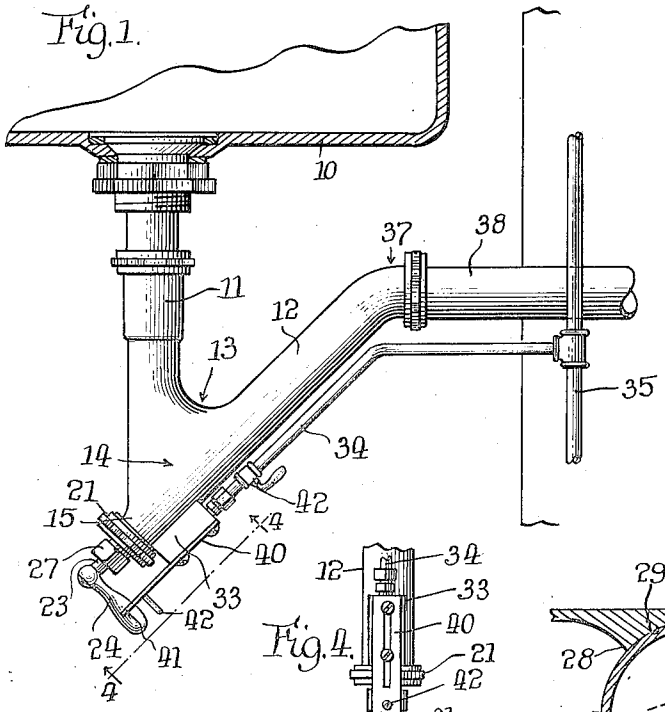


Fig. 4.

Fig. 5.

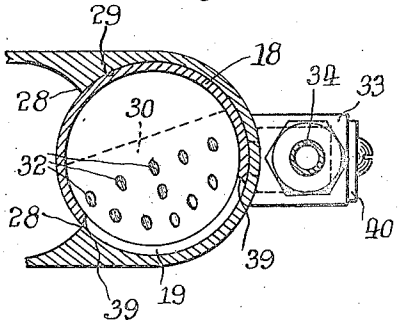


Fig. 2.

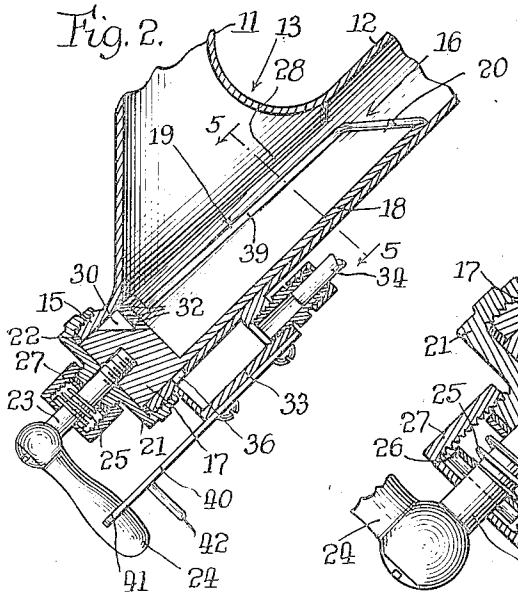
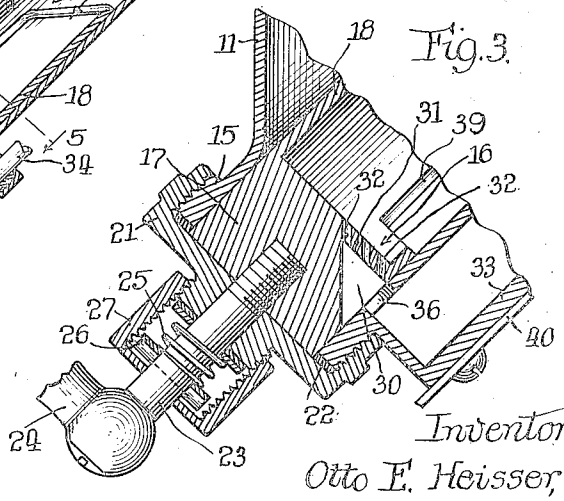


Fig. 3.



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DEVICE FOR CLEANING DRAIN TRAPS

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10 Claims. (Cl. 182—22)

The invention relates to a device for cleaning drain traps and the general aim of the invention is to provide a device of this character which is positive in action, is simple to operate and which may be manufactured and sold at a relatively low cost.

Another object of the invention is to provide a drain trap cleaning device of new and improved construction wherein the foreign matter which accumulates to clog the drain is first freed and then discharged down the drain.

In conjunction with the foregoing a further object resides in the provision of means for freeing or loosening the accumulated matter in the act of setting the mechanism for operation, which act also closes the return line to the sink or other connected member and establishes a connection with a source of water for forcing the freed matter from the trap and along the drain to discharge.

Another object is to provide a new and improved device of this nature which embodies a dual valve structure, one of which valves controls the pipe line from the sink to the trap while the other valve establishes a connection with a water supply (preferably a hot water supply) only when the first mentioned valve is in pipe closing position.

Other objects include the provision of novel means for freeing the accumulated material with a cutting, shearing action, and for maintaining the trap cleaning means in a position permitting normal operation of the drainage system.

Other objects and advantages will become apparent in the following description and from the accompanying drawing, in which:

Figure 1 is a fragmentary view of a drainage system having a cleaning device associated therewith which embodies the features of the invention.

Fig. 2 is an axial section through the drain trap.

Fig. 3 is an enlarged axial section of the lower end of the drain trap.

Fig. 4 is a face view of one side of the device and the direction of the view is indicated by the arrows 4—4 in Fig. 1.

Fig. 5 is a transverse section taken along the line 5—5 in Fig. 2 but with the parts in a different relative position.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In the drawing, the present invention has been shown for illustrative purposes as being incorporated in the drainage system leading from a sink 10. It is to be understood, however, that the sink is representative of any source of drainage. Communicating with the sink and leading downwardly therefrom is a drain pipe 11 which communicates with the return pipe 12 at a generally U-shaped bend 13 which is downwardly extended in the usual manner to form a water trap. In this instance, it is preferred that the pipe 11 be located on a substantially vertical axis and that the return pipe 12 communicate therewith at an acute angle whereby to form at the lower portion a pocket in which foreign matter may accumulate.

As shown, the pipes 11 and 12 have an integral union generally designated 14 and at its lowest side the union has an annular flange 15 which is coaxial with the return pipe 12 and in effect is a continuation thereof. Rotatably seated within said flange on the axis of the return pipe is an elongated valve member 16 which extends inwardly past the union 14 and into the return pipe 12 proper. The valve member 16 has a base 17 of substantial thickness disposed within the flange 15 and a cylindrical wall or sleeve 18 which extends inwardly from the base 17 and has a longitudinally open side face 19 (Figs. 2 and 5) and an open inner end 20.

A gland 21 has screw threaded engagement with the flange 15 to enclose the valve within the trap and such means as a packing gasket 22 seals the assembly against leakage. A valve actuator 23 extends from the valve base 17 outwardly through the gland 21 and has a handle 24, or the like, at its outer end for facilitating manipulation of the valve. Preferably such means as a spring 25 (Fig. 3) interposed between the gland and a washer 26 fixed on the valve actuator is employed to exert a force on the actuator for holding the valve seated within the flange 15 and against the base of the gland. This assembly may be enclosed by a hollow nut 27 engaging the gland.

Within the union 14 and on opposite sides thereof are shoulders 28 which extend completely across the union in substantially parallel relation

to the axis of the return pipe 12. The surfaces of the shoulders next to the valve 16 are arcuately formed, as shown at 29 (Fig. 5), on the axis of the return pipe 12 as a center whereby to provide bearing surfaces for the cylindrical wall 18 of the valve. The space between the innermost points of the shoulders 28 is the passageway for drainage from the pipe 11 to the return pipe 12 and the width of the open side face 19 of the sleeve 18 is correspondingly dimensioned. Preferably, the shoulders 28 are relatively wide at the top and taper gradually to a narrow portion at the bottom to prevent an accumulation of foreign matter ahead of the shoulders.

A recess 30 is formed in the base 17 of the valve below the open side face 19 and this recess is separated from the interior of the sleeve by a transverse wall 31 having a plurality of axially directed apertures 32 therein. A hollow casing 33 is suitably secured to the trap on the side thereof opposite the pipe 11. This casing communicates through a conduit 34 (Figs. 1 and 2) with a source of water under pressure. Preferably a hot water supply line 35 is employed as the source of water although a cold water line will serve. The wall of the trap has a port 36 therein which communicates with the interior of the casing 33 and this port is so located as to be opposed by the recess 30 in one position of the valve 16. The preferred relationship between the recess 30, sleeve 18, and the port 36 is such that the recess is moved to establish communication with the port 36 only after the valve has moved a distance sufficient to position a portion of the shell across the space between the shoulders 28. In other words, communication between pipes 11 and 12 is completely interrupted before the sleeve portion of the valve 16 is placed in communication with the source of water.

The operation of the device is as follows: Presuming that the parts are in the normal position as shown in Fig. 2, drainage occurs through the trap in the usual manner except that the drainage flows through the interior of the sleeve 18. After a time a considerable quantity of foreign matter may accumulate within the union 14 and particularly in the lower portion thereof. To remove such accumulations the operator rotates the valve by means of the handle, which movement first closes communication between the pipes 11 and 12 at a point above the bottom of the trap, and then establishes communication between the recess 30 and port 36 to cause an injection of water under pressure into the sleeve 18 at the lowermost point or behind the accumulations therein. This injection of water discharges the accumulated matter from the drain through the return pipe 12. As shown in Fig. 1, it is preferred that the upper end of the return pipe 12 be formed with a gentle bend 37 therein for connection with a pipe 38 which leads to a waste pipe or the like (not shown). Thus, no obstruction is offered to the discharge of foreign matter.

It is preferred to provide means for freeing the accumulated matter before the discharging water is introduced. To this end the margins of the shell 18, defining the open side face 19 and inner end 20, are sharpened as indicated at 39 (Fig. 5) whereby in the rotating action of the valve these edges will cut the accumulated matter free from the inner walls of the union. To increase the cutting action the sharpened margins defining the open side face 19 may be formed at a slight angle to the direction of rotation of the valve, as shown in Fig. 2, to cut with a shearing action.

Means may be provided for positively maintaining the valve in the normal position thereof and in the present instance this means comprises a slide 40 (Figs. 2 and 4) supported by the casing 33 and having a forked lower end 41 for engagement with the handle 24 when the valve is in its normal position. A finger piece 42 may be provided on the slide for manipulation thereof. Although the base 17 of the valve 16 functions as a valve for controlling the introduction of water through the port 36, it is desirable to provide a cut-off valve 42 in the conduit 34 for preventing leakage into the drainage system. In conditioning the apparatus for operation, therefore, it is necessary first to open the cut-off valve 42 and to move the slide 40 to release the valve 16 for manipulation.

It will be evident from the foregoing that a novel means has been provided for cleaning the trap-part of the drainage system which, by a simple manipulation on the part of the operator, is effective positively to dislocate and discharge all accumulations of foreign matter from the trap. Because of the dual valve and the relationship of the parts controlled thereby, no part of the accumulations can be forced backwardly along the pipe which returns to the trap. The device is simple and inexpensive to manufacture and install, and may therefore be sold at a low cost.

I claim as my invention:

1. A device for cleaning drain traps comprising, in combination, a U-shaped trap having one leg leading to the trap and another leg leading to a drain, means including a sleeve journaled concentrically within said last mentioned leg for closing the leg leading to the trap, and means for introducing pressure fluid into the trap behind accumulated matter therein.

2. A device of the character described comprising in combination with a drainage system having a U-shaped section therein, means including a sleeve valve journaled axially within one part of said section for closing one part of said section, and means operable only when said sleeve valve is in closed position for injecting water into the other section behind accumulations of system clogging material therein.

3. A drain system comprising the combination of a pipe leading from a source of drainage, a return pipe leading to drain, said pipes communicating at an acute angle, a sleeve journaled in said return pipe and having an open side and inner end through which drainage normally flows, said sleeve being rotatable to a position to prevent communication between said pipes, and means for establishing communication between the bottom of said sleeve and a source of water.

4. A drain system comprising the combination of a drain pipe leading downwardly from a source of drainage, a return pipe returning to drain and connected at its lower end with said first mentioned pipe and at its upper end having a gentle bend therein, means for closing the pipe which leads from the source of drainage at a point above the lowermost part of the connected pipes, and means communicating with the aforesaid means and connecting substantially said lowermost point with a source of water under pressure for forcing accumulations of material therein upwardly along said return pipe and past said gentle bend.

5. A drain system comprising, in combination, a pipe leading from a source of drainage, a return pipe leading to drain, said pipes communicating at an acute angle, and an elongated sleeve journaled in said return pipe and extending upwardly thereinto from substantially the lowermost point thereof, said sleeve having a closed base and an open side and upper end, means for rotating said sleeve from a normal position in which the open face communicates with the pipe which leads from a source of drainage to a position in which the sleeve prevents communication between said pipes, and means in the base of said sleeve for establishing communication with a source of water under pressure, said last mentioned means and the open face of said sleeve being correlated so that said sleeve is moved to prevent communication between the pipes before the communication with the source of water is established.

6. A drain system comprising, in combination, a pipe leading from a source of drainage, a return pipe communicating therewith and leading to drain, an elongated valve journaled in said return pipe and having a large passageway therein through which communication between said pipes is normally established, means for rotating said valve, cutting means on said valve operable in the rotation thereof to free accumulations of foreign matter, and means controlled by the movements of said valve to inject water under pressure behind such accumulations after the valve has been rotated to prevent communication between said pipes.

7. A drain system comprising, in combination, a pipe leading from a source of drainage, a return pipe communicating therewith and leading to drain, an elongated valve journaled in said return pipe and having a large passageway therein through which communication between said pipes is normally established, means for rotating said valve, means controlled by the movements of said valve to inject water under pressure behind accumulations in the pocket between said pipes after the valve has been rotated to prevent communication between said pipes, and manipulable means for holding said valve in the position wherein said pipes are in communication.

8. In a drain system, the combination of a pipe leading from a source of drainage, a return pipe leading to drainage, said pipes being connected to form a water trap, manipulable valve means including a sleeve journaled concentrically in one of said pipes for closing the pipe which leads from the source of drainage at a point above the bottom of the trap, and means for injecting hot water into said trap behind the accumulations therein to eject said accumulations through said return pipe.

9. A drain system comprising in combination with a downwardly extending U-shaped trap, of valve means in said trap for preventing an inflow of drainage into the lower portion thereof wherein foreign matter accumulates, means operable in the movement of said valve means to cut the accumulation of foreign matter free from the sides of the trap, and means for injecting water under pressure behind the accumulation to force it from the trap after it has been freed.

10. A drain system comprising in combination with a downwardly extending U-shaped trap, valve means in said trap for preventing an inflow of drainage into the lower portion thereof wherein foreign matter accumulates, means on said valve angularly disposed with respect to the direction of rotation of said valve means to cut an accumulation of foreign matter free from the walls of the trap with a shearing action, and means for injecting water under pressure behind the foreign matter to force it from the trap after it has been freed by the movement of the valve to the closed position thereof.

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