

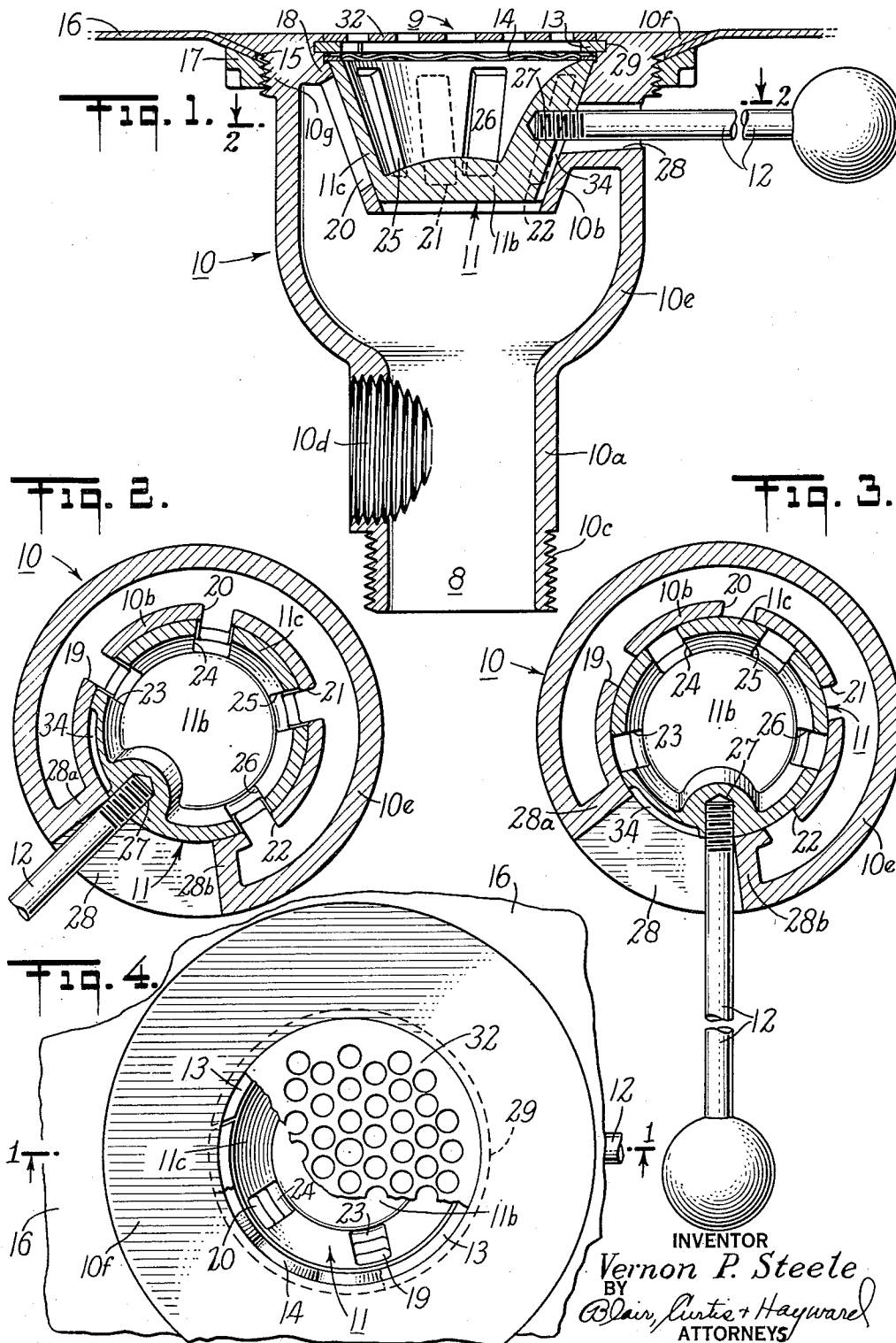
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DRAIN VALVE

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DRAIN VALVE

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This invention relates to a valve, and more particularly to a drain valve for use in sinks.

One of the objects of this invention is to provide a valve which is simple, thoroughly practical, and durable in use. Another object is to provide a device of the above character which may be quickly and easily operated by the user. Another object is to provide a device of the above character, the manufacture of which would be economical both from the standpoint of labor and materials used. Another object is to provide a device of the above character which will be sturdy and well able to withstand hard usage. A further object is to provide an efficient valve which will not leak, and which cannot be plugged by grease and other materials. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing in which is shown one of the various possible embodiments of this invention,

Figure 1 is a vertical section taken through the center of the valve with the valve mounted on the bottom of a sink;

Figure 2 is a horizontal section of the valve taken on the line 2—2 of Figure 1, the valve being in an open position;

Figure 3 is a view similar to Figure 2, the valve being in a closed position; and,

Figure 4 is a top plan view of the valve shown in Figure 1, certain parts being broken away for purposes of illustration.

Similar reference characters refer to similar parts throughout the several views of the drawing.

As conducive to a clearer understanding of certain features of this invention, it might here be pointed out that certain difficulties are experienced with sink drain valves now in use. One of the major difficulties lies in the fact that foreign material washed off plates in the sink very often clogs the valve parts, and this impairs its efficiency. In many cases, the valve must be disassembled in order to clean it, which is seldom done by the type of labor that operates this type

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of valve. If these valves are not cleaned, liquids flow through the valve at a very slow rate which consumes a considerable amount of the operator's time. This, of course, results in a financial loss to the employer. Accordingly, another object of this invention is to overcome the above-mentioned difficulties as well as many others.

In general, the valve includes a metal casing, generally indicated at 10, having a frusto-conically-shaped portion 10b positioned beneath the valve intake opening 9. A conically-shaped cup, generally indicated at 11, is rotatably mounted in portion 10b of casing 10. Cup 11 and portion 10b of casing 10 are provided with openings which may be moved into or out of registry with respect to each other by means of a handle 12 connected to cup 11. Cup 11 is held in position on casing 10 by means of a snap ring 13 mounted in a groove 29 in casing 10. Ring 13 acts through circular corrugated spring 14 to press downwardly upon the upper edge of cup 11.

Referring now to the drawings in detail, casing 10 includes a cylindrically-shaped lower portion 10a having threads 10c thereon for connecting the exhaust opening 8 of the valve to a drain pipe (not shown). A threaded opening 10d is provided in the side of section 10a, which may be connected to the overflow opening in the sink in which the valve is mounted. The upper portion 10e of casing 10 is bell shaped and has a tapered flange 10f formed on its upper edge. When the valve is mounted in sink 16, a circular hole 15 is formed in the bottom of the sink. The edge of hole 15 is bent downwardly to form a seat for flange 10f so that the upper face of casing 10 when mounted on the sink is flush with the sink's bottom. The portion 10g of casing 10 is threaded to receive a nut 17 which secures casing 10 to sink 16.

Casing 10 is provided with an inwardly extending annular flange 18 (Figure 1) from which the conically-shaped portion 10b of casing 10 extends downwardly. Portion 10b is open at the bottom, has a ground inner wall, and is provided with four ports 19, 20, 21 and 22 (Figures 2 and 3). All of the ports are rectangularly shaped, are of the same size as port 21 (Figure 1), and are vertically positioned in portion 10b.

Cup 11 has a solid bottom 11b having a dome-shaped upper surface, and its side wall 11c is

ground to fit the inner wall of portion 10b of casing 10 so that it may be turned with respect to portion 10b. Cup side wall 11c is provided with a series of ports 23, 24, 25 and 26, which are of substantially the same size as ports 19, 20, 21 and 22, and which, when the cup 11 is in the position it occupies in Figure 2, register with ports 19, 20, 21 and 22. When the cup 11 is turned to the position it occupies in Figure 3, ports 23, 24, 25 and 26 are moved out of register with ports 19, 20, 21 and 22 and are closed by the inner wall of portion 10b of casing 10.

To permit cup 11 to be turned, it is provided with a threaded hole 27 (Figures 1 and 3) into which the inner end of handle 12 is threaded. Casing 10 is provided with a horizontal slot 28 through which handle 12 passes and which permits handle 12 to be moved back and forth horizontally to turn cup 11 with respect to casing 10. As handle 12 is moved back and forth, the end walls 28a and 28b (Figure 3) of slot 28 serve as stops to limit the movement of handle 12. It will be noted that sufficient space is provided between handle 12 and ports 23 and 26 in cup 11 so that neither port can be moved into registry with horizontal slot 28.

To retain cup 11 within portion 10b of casing 10, split snap ring 13 (Figures 1 and 4) is provided. This ring is mounted in a groove 29 and acts through its inner lower surface to press downwardly upon spring 14 (Figures 1 and 4), which is of circular shape and positioned above the upper edge of cup 11. Spring 14 resiliently holds cup 11 seated on portion 10b of casing 10. A perforated disc 32, which serves as a strainer, is mounted on the upper surface of ring 13 with its upper surface flush with the upper surface of casing 10.

To insure that any seepage into handle opening 28 will not flow outside of the valve casing, a port 34 (Figures 1, 2 and 3) is provided. Port 34 is cut into the side wall of cup 11 and leads from slot 28 downwardly, opening into the space beneath cup 11. It will be noted, referring to Figure 1, that the bottom of slot 28 slants inwardly to insure that all seepage will flow into port 34. Port 34 is so positioned that when the valve is in an open position, as shown in Figure 2, port 34 is closed, at at this time the water from the sink can flow through the registered ports in cup 11 and portion 10b of casing 10. When the valve is closed, as shown in Figure 3, then port 34 is positioned so that all seepage will drain downwardly into the lower portion of the valve.

It has been found that threads from mops are one of the major factors leading to clogged ports, as the threads very often bridge two ports and other foreign material catches on them. In the present valve, the threads and other material can be sheared by simply opening and closing the valve and then the valve clears itself because liquids striking bottom 11b of cup 11 results in a churning action which cleanses the cup of any foreign material caught between two ports. The dome-shaped bottom 11b has been found to increase this action. In contrast to this, where flat plates are used there is no churning action to remove foreign material between the ports, as the flow is always directly downwardly through the ports, and thus the ends of pieces of foreign material bridging the ports remain in port clogging position.

It will thus be seen that an entirely practical and efficient valve has been disclosed which is

sturdy and well able to withstand hard usage, which is so constructed that it cannot be clogged by grease and foreign material. It will thus be seen that the several objects hereinabove mentioned, as well as many others, have been accomplished.

As many possible embodiments may be made of the above invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a drain valve for a sink, in combination, a casing, said casing including intake and exhaust openings and a portion including a conically-shaped wall positioned beneath said intake opening, said intake opening opening into the mouth of said conically-shaped portion, a cup-shaped member positioned in and rotatably mounted on said conically-shaped portion, a snap ring mounted on said casing above the upper edge of said cup member, spring means positioned between said retaining ring and the upper edge of said cup member, said spring exerting resilient pressure downwardly upon said cup to hold it seated on the conically-shaped portion of said casing, means forming ports in the side wall of said member and said conically-shaped portion, said ports in the side wall of said cup-shaped member being the only ports in said cup-shaped member, said ports in said conically-shaped portion opening into the interior of said valve and thus being connected to said exhaust opening, said ports being adapted to be moved into and out of registry with respect to each other, and means for turning said cup-shaped member with respect to said conically-shaped portion to move its ports into and out of registry with respect to the ports of said conically-shaped portion.

2. In a drain valve for a sink, in combination, a casing, said casing including a cylindrically-shaped lower portion which has the exhaust opening therein and which is adapted to be connected to a drain pipe, said casing also including an enlarged upper portion integrally connected to said lower portion which has a frusto conically-shaped portion extending downwardly there-through, the outer wall of said frusto conically-shaped portion being spaced from the enlarged portion of said casing, the inner wall of said frusto conically-shaped portion being smooth, the larger end of said frusto conically-shaped portion being positioned beneath the intake opening of said casing, a cup-shaped member having a smooth outer wall shaped to seat in the inner wall of said frusto conically-shaped portion, said cup-shaped member being positioned in said frusto conically-shaped portion and being adapted to be turned with respect thereto, a series of ports formed in the walls of said frusto conically-shaped portion and said cup member, said ports being so positioned that the ports in said cup-shaped member may be moved into and out of registry with respect to the ports in said frusto conically-shaped member when said cup-shaped member is turned, a snap ring positioned above said cup-shaped member and connected to said casing, spring means positioned between said snap ring and the upper edge of said cup-shaped member, said spring means holding said cup-shaped member seated on the frusto conically-shaped portion of said casing, a strainer positioned over

said intake opening, means forming a slot in the side wall of the enlarged portion of said casing, a handle extending through said slot and connected to said cup-shaped member, said handle being used for moving said cup-shaped member into and out of open position, means forming a drain opening connecting said slot to the interior of said casing to conduct any seepage from said slot into the interior of said valve, and means for connecting said valve to the bottom of the sink. 10

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