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(54) **DOME TRAP**

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(57) **ABSTRACT**

An improved dome shaped trap for bathroom, kitchen or other sink comprising a dome shaped trap, threadably attached to a cover. The cover comprises a vertical conduit adapted to receive the existing vertical influent drain from the sink, a horizontal conduit adapted to be attached to the existing effluent exit drain, the vertical conduit extending down below the water line, providing an extension for the exisiting influent drain, making the trap easily adjustable to be installed any existing sink. The dome trap is easily removable by hand, by unscrewing it from the cover, to clean out any debris clogging the line or to retrieve any item inadvertently dropped into the sink and down the drain into the dome trap.

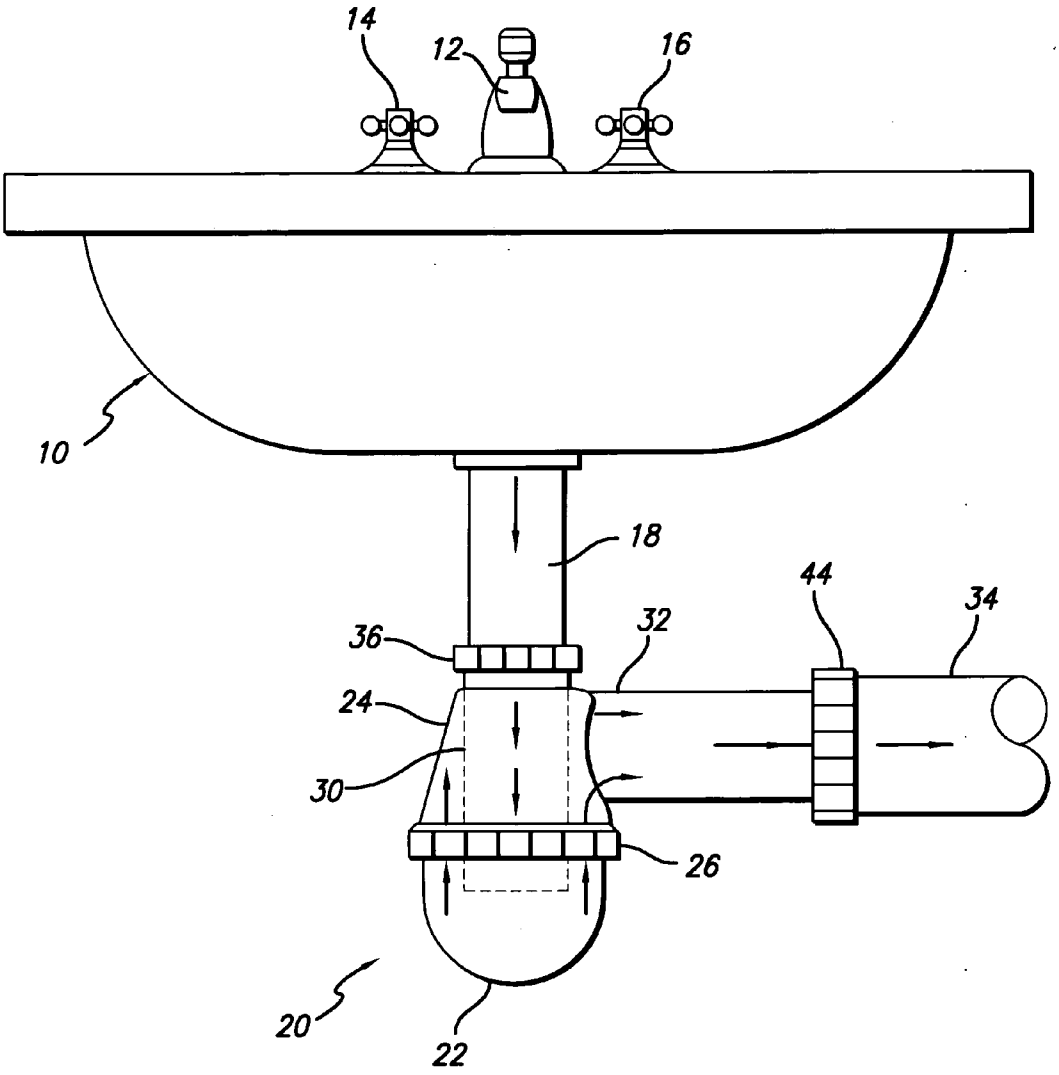
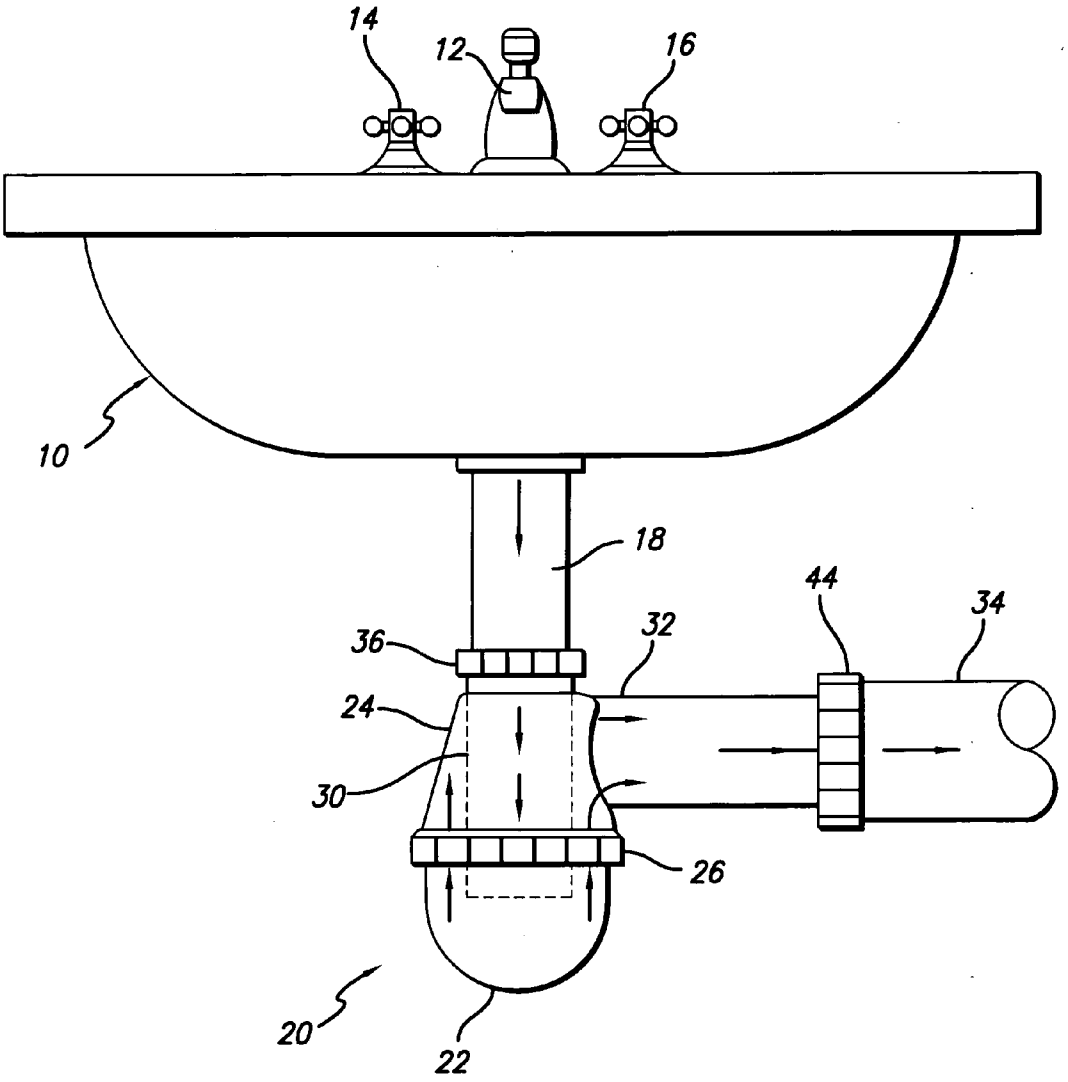


FIG. 1



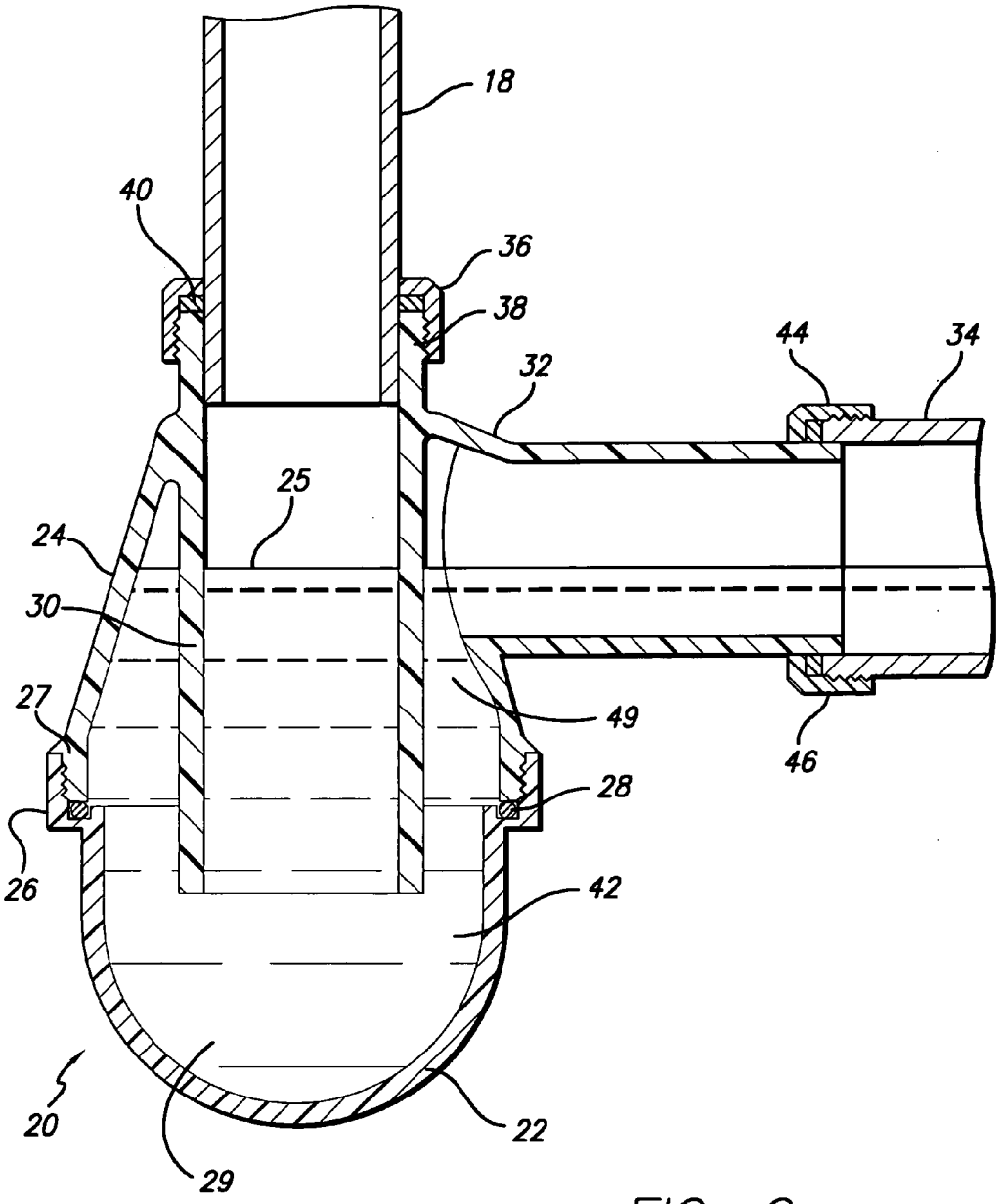



FIG. 2

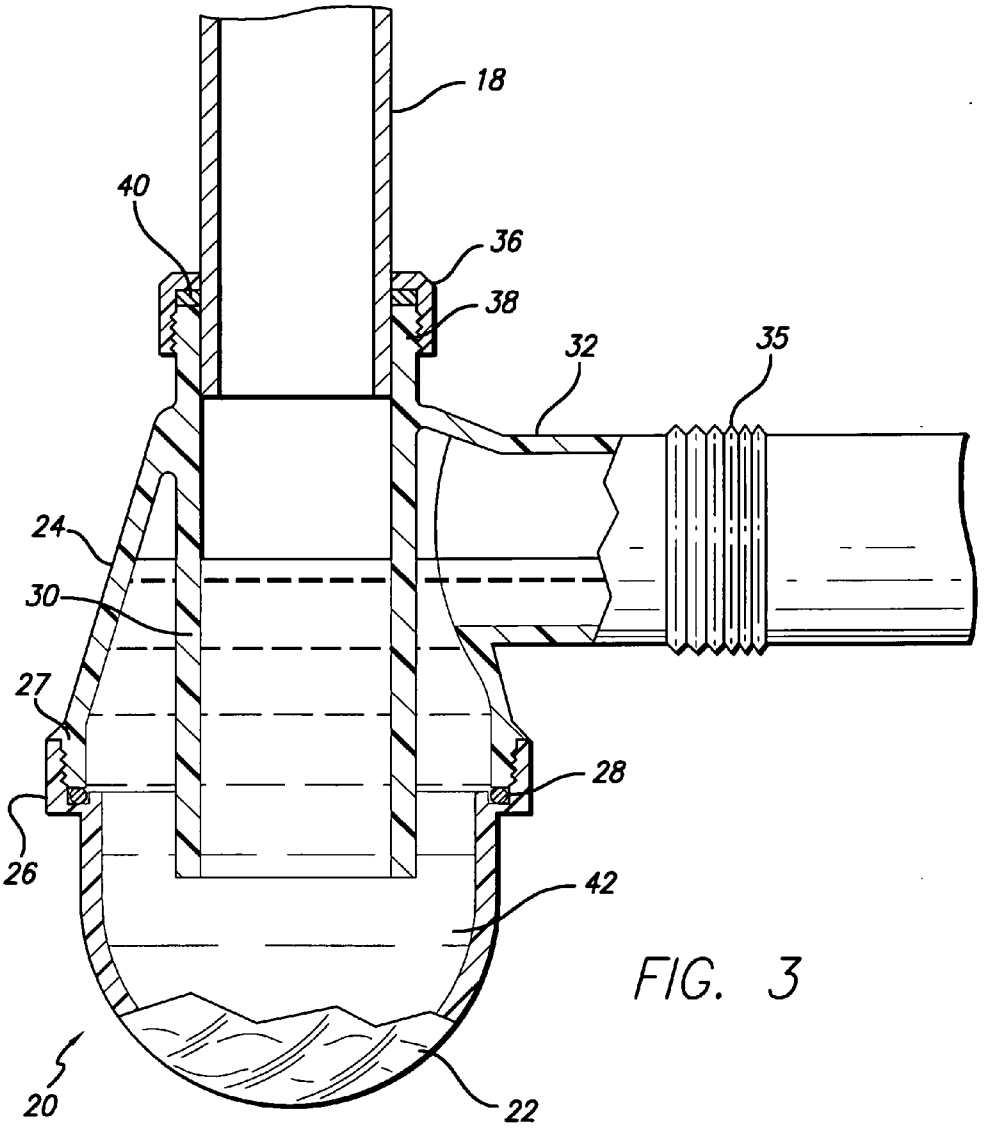



FIG. 3

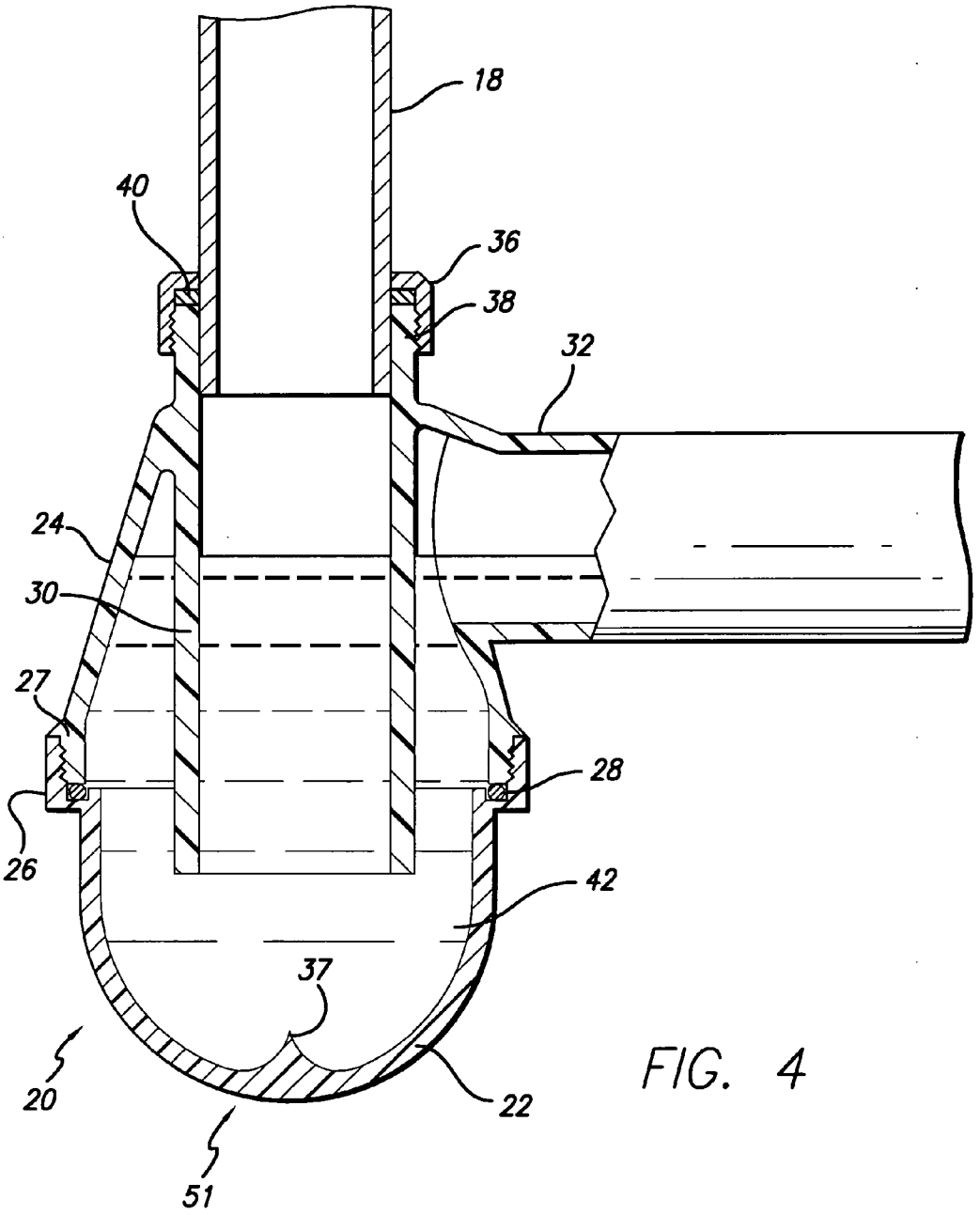



FIG. 4

# DOME TRAP

[0001] This application is a continuation-in-part of copending application Ser. No. 10/094,471, filed on Mar. 8, 2002, which itself is a continuation-in-part of prior application Ser. No. 09/713,955 filed Nov. 16, 2000, now abandoned.

## BACKGROUND OF THE INVENTION

[0002] Common household sinks in the bathroom and kitchen require a drain trap that trap solid waste matter, such as hair and other materials that commonly clog drains. The usual drain trap is a U-shaped pipe installed under most household, and other sinks. The U-shaped portion of the drain trap remains full of water, which provides a barrier against odors backing up from the sewer line through the sink.

[0003] If the common drain trap gets clogged, most persons try to use a chemical to dissolve the clog, such as "Drano" or "Liquid Plumber". Sometimes that works and sometimes it does not. Even if it works, it usually takes several hours or longer to take effect. If chemicals do not work, the trap is quite difficult to open to clean out, usually requiring a call to a plumber.

[0004] In addition, a special problem exists if something valuable, such as a ring, is dropped down the drain. The drain must be taken apart to retrieve the lost item, again by a plumber.

[0005] A spill free trap is described in U.S. Pat. No. 5,159,724 to Vosper, dated Nov. 3, 1992, which shows a container trap. Vosper's concept is to provide a "spill free" trap designed so that water does not spill when the trap is opened. Having a spill free trap is virtually impossible, since the drain can be clogged to the top of the sink. The problem with Vosper's trap is that existing sink inlet line **30** must extend down below the water line. When the trap is moved up so that line **30** extends below the water line, outlet drain line **40** may not match up with the exit conduit (not numbered) of Vosper's trap. The inverse may also be true. If Vosper's device has to be moved down so as to match up with exit line **40**, inlet line **30** may not extend below the water line, in which case the device will not function as a trap. Vosper has very little vertical adjustment available to match up with exit drain line **40**.

[0006] Another device is shown by Uriarte U.S. Pat. No. 4,681,131 who discloses a complex floating body membrane which floats on the top of the water in the trap to stop the flow of sewer gases, so that the sink drain line does not have to extend below the water line in the trap. The problem with the Uriarte device is that it requires moving parts with a membrane and the aid of the liquid to prevent sewer gases from going back up the drain line. Once assembled the Uriarte device cannot be disassembled lest the membrane fall out making reassembly quite difficult. There is no provision for cleaning out the trap, which may well contain foreign particles which may clog or foul the membrane. The trap of Uriarte is opened only at the time of manufacture, to install the membrane mechanism, and cannot be opened thereafter, as Uriarte shows no removable connection. Certainly, the homeowner cannot open the trap to clear it.

## SUMMARY OF THE INVENTION

[0007] Applicant's invention comprises a large dome shaped trap which can easily be opened by any person, simply by unscrewing the dome trap from its cover. The dome trap is threadably attached to its cover, as will be described, but requires only hand tightening, so that it is easily removed to clean the trap or retrieve a lost object.

[0008] In addition, replacing the normal U-shaped trap in a household sink is often not a easy task because the location of the exit line or conduit may not match up with the exit line of the new trap. Applicant's trap comprises an internal conduit which allows the trap, when it is installed, to be highly vertically adjustable, and moved up or down a great distance, so that it easily matches the position of the fixed influent vertical drain line and the fixed horizontal effluent exit line of nearly every sink. An additional feature is the use of a flexible effluent exit line which adds to the adjustability of the dome trap of this invention.

[0009] Another feature comprises the dome portion being transparent, so that the user can see into the lower dome trap portion to see items that might have fallen into the trap and/or to see the extent of the build-up of waste, so that the user knows just when to clean it out.

[0010] Another feature comprises an indicator inside of the bottom of the dome, so that when the waste in the bottom of the trap covers the indicator, the user knows that it is time to clean the trap.

## OBJECTS OF THE INVENTION

[0011] Accordingly, several objects and advantages of the invention are as follows:

[0012] It is an object of the present invention to provide a drain trap for a common household sink which protects the household from sewer gasses, is easily installed, readily accessible, and easy to open to clean.

[0013] Another object of the invention is to provide such a device which is large enough to collect a substantial amount of waste which may easily be opened by hand if the drain becomes clogged.

[0014] Still a further object of the invention is to provide such a device which is significantly adjustable, so that it may be installed on any existing sink.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0015] **FIG. 1** is a front view of the dome drain trap of this invention;

[0016] **FIG. 2** is a cross-section of the drain trap and the incoming and outgoing lines to which it is attached;

[0017] **FIG. 3** is a cross-section of another embodiment; and

[0018] **FIG. 4** is a cross-section of another embodiment.

## DETAILED DESCRIPTION OF THE INVENTION

[0019] Referring now to the drawings, there is shown a common household sink **10** having a faucet **12** and hot and cold water handles **14** and **16**. Water drains from sink **10** down influent drain line tailpiece **18**. Drain line **18** extends down into dome drain trap **20**. Dome drain trap **20** comprises a dome shaped lower trap bowl **22** and an upper cover **24**. Lower dome shaped bowl **22** threadably connects to cover **24** at threaded connections **26** and **27**, at which there is gasket seal **28**. Dome **22** may be tightened by hand only, onto cover **24** and creates a perfectly water tight seal. Thus, it may be unscrewed and dome **22** removed without the use of any tools.

[0020] Dome trap **20** also comprises an internal vertical pipe or conduit **30** which is an integral part of cover **24** and runs from the top of cover **24** down into lower dome bowl **22**, so that it extends below water line **25**, well down into the weir **29** of dome **22**, below effluent exit line **34** and below threaded connections **26** and **27** where cover **24** and dome **22** threadably connect. Vertical conduit **30** is formed monolithically as an integral part of cover **24**.

[0021] Dome trap **20** may be made of any convenient material, the most practical being either ABS (Acrylonitryl-butadyene-styrene) or PVC (Polyvinylchloride) plastic. The two parts of the trap are both injection molded. One part is the lower dome trap bowl **22**. The other part is the cover **24** having internal vertical conduit **30** molded and manufactured as a part thereof.

[0022] Exit line **32** is also a part of dome trap **20**, molded as a part of cover **24**, adapted to be connected to an existing effluent exit drain line. Drain line **18** fits into vertical conduit **30** and is held by compression nut **36**, which threadably attaches to cover **24** at threads **38**. Compression nut **36** has an integrated plastic washer or a non-integrated plastic slip washer **40**. Horizontal exit line **32** attaches to the existing building exit line (not shown) by compression nut located on the building effluent exit line.

[0023] Vertical conduit, drain line **30**, for most sinks, is made slightly over 1½ inches in inside diameter, while the inside diameter of most standard sink drain lines, such as drain line **18**, is 1½ inches. Because drain line **18** is usually made of metal its gauge will be very thin and drain line **18** will slide into vertical conduit **30** in a vertical direction. Vertical conduit **30** can be made very slightly larger in diameter, so that drain line **18** slides tightly but more easily into vertical conduit **30**. By drain line **18** fitting tightly into vertical conduit **30**, the entire assembly is more solid, secure and tight fitting, which makes removal of lower dome bowl **22** easier.

[0024] The ability to have drain line **18** slide into drain line **30**, in the vertical direction, is critical, because when installing a new trap, lining up exit line **32** with the existing house or building effluent exit drain is absolutely necessary, to install a new trap, such as dome trap **20**. Effluent exit drains that already exist in sink installations vary considerably in vertical location. Without the ability to slide dome trap **20** up and down on drain line **18**, in many cases it would be impossible to install a new trap, since the horizontal exit lines would not meet properly. Vertical line **30**, molded as an internal part of cover **24**, allows great adjustability in lining up exit drain line **32** and the existing building effluent exit line.

[0025] In addition, drain line **18** does not have to itself extend below the water line **25**, since internal vertical conduit **30** does so, and drain line **18** only has to slide a small distance into vertical conduit **30** of cover **24** and be held by compression nut **36**. This means 1) that drain lines which are short do not have to be modified and 2) exit line **32** can be easily matched up and connected to the existing house effluent exit drain line. This is of great value to a homeowner or plumber who is replacing the existing sink trap. Furthermore, those persons who want to install Applicant's dome trap in their sinks because of its ease in being opened for cleaning, can do so with ease. For the do-it-yourself homeowner, Applicant's dome trap is easy to install in any existing sink and it is easy to open and clean in the event of a clog. It is also easy to open to retrieve an item inadvertently dropped into the sink.

[0026] Long drain lines **18**, on the other hand, can slide all the way down through vertical conduit **30** and even extend below its terminus **31**.

[0027] Referring now to **FIG. 3**, there is shown another embodiment having additional, optional features where the lower dome bowl **22** is made of a transparent material, such as tempered glass or plastic, which gives the owner the benefit of being able to see what is present inside of lower dome bowl **22**. If something is mistakenly dropped into the sink and falls into dome bowl **22**, the owner may be able to see it and unscrew and remove dome bowl **22** to recover the item. Also, the owner can see the build-up of waste in the bottom of dome bowl **22** to determine exactly when to remove it for cleaning purposes.

[0028] An additional feature is the use of a flexible exit conduit line **35** where a flexible section **34** of line **32** is provided. This flexible section gives even more adjustability to dome trap **20**, where the attachment to the building effluent drain line is hard to match up vertically or horizontally with exit conduit **32**.

[0029] Referring now to **FIG. 4**, there is shown another embodiment is which a cone shaped indicator **37** is fixedly attached to the bottom of lower dome trap bowl **22**. The height of indicator **37** is optional and is provided as an indicator of when the waste has built up to a height where the lower dome trap bowl should be unscrewed, removed and cleaned out. Indictor **37** is cone shaped, and formed or molded as a part or lower dome trap bowl **22**, with the large end of the cone down, which also makes indicator **37** useful to push incoming water from inlet pipe **18**, to the sides and up the sides of lower dome bowl **22**.

[0030] Lower dome trap bowl **22** may be made in several different sizes and may be made larger and elongated for use in locations where more debris is likely to be present, such as sandy areas or where grease is present, such as in repair shops, and the like.

[0031] Exit line **32** must be equal to, or greater in diameter than inlet line **18**. This is required by most building codes so that the exit line is able can carry as much water out, as

comes in. Waste water **42**, entering from drain line **18**, will fill dome trap bowl **22** and clarified waste water will rise against gravity to crown weir level **49** or slightly above crown weir level **49**, above exit line **32** and the existing building effluent exit line **34**. As more water enters dome trap **20**, it rises outside of internal conduit line **30**, and passes out exit line **32**.

[**0032**] If the drain or the trap becomes clogged, dome **22** can be unscrewed by hand to clean out the trap. When dome **22** is removed, water **42**, which fills above the level of removable dome **22**, will spill out, and a container such as a bucket, should be placed underneath the trap, when it is being opened.

[**0033**] Having thus described the invention,

I claim:

**1**: A drain trap for a sink having an influent drain line and an effluent exit line comprising, a trap which fits between the influent drain line and the effluent exit line, the trap having a transparent dome shaped lower trap bowl having a cone-shaped indicator fixedly attached to the bottom thereof, the lower trap bowl threadably attached to a sealed cover, a vertical conduit inside of said cover, which is an integral part of said cover and formed monolithically as a part of the cover, the vertical conduit having an inside diameter equal to, or slightly larger than, the influent drain line, the lower end of said vertical conduit extending below the water line in the trap, said vertical conduit adapted to receive the influent drain line, a horizontal conduit exit line above the dome shaped lower trap bowl, the exit line having a flexible conduit segment and being an integral part of the cover, the exit line having an inside diameter equal to or greater than the influent drain line.

**2**: The device of claim 1 further comprising means to seal the connection between influent drain line and the vertical conduit, and the connection between the horizontal conduit exit line and the effluent exit line.

**3**: The device of claim 2 in which said means is a compression nut.

**4**: The device of claim 3 in which said compression nut has an integrated plastic washer.

**5**: The device of claim 3 in which said compression nut has a non-integrated plastic slip washer.

**6**: The device of claim 1 in which the dome trap is made of plastic.

**7**: The device of claim 1 in which the cover, vertical conduit and horizontal conduit are all injection molded monolithically as a single integrated unit.

**8**: A drain trap for a sink having an influent drain line and an effluent exit line comprising, a trap which fits between the influent drain line and the effluent exit line, the trap having a dome shaped lower trap bowl, threadably attached to a sealed cover, a vertical conduit inside of said cover, which is an integral part of said cover and formed monolithically as a part of the cover, the vertical conduit having an inside diameter equal to, or slightly larger than, the influent drain line, the lower end of said vertical conduit extending below the water line in the trap, said vertical conduit adapted to receive the influent drain line, a horizontal conduit exit line above the dome shaped lower trap bowl, the exit line being an integral part of the cover and formed monolithically as a part of the cover, the exit line having an inside diameter equal to or greater than the influent drain line.

**9**: The device of claim 8 further comprising means to seal the connection between drain line and the vertical conduit, and the connection between the horizontal conduit and the exit line.

**10**: The device of claim 9 in which said means is a compression nut.

**11**: The device of claim 10 in which said compression nut has an integrated plastic washer.

**12**: The device of claim 10 in which said compression nut has a non-integrated plastic slip washer.

**13**: The device of claim 8 in which the dome trap is made of plastic.

* * * * *