Nov. 18, 1952 A. J. HIERTZ 2,617,997

SINK DRAIN DEVICE

Filed Jan. 7, 1950 2 SHEETS—SHEET 1

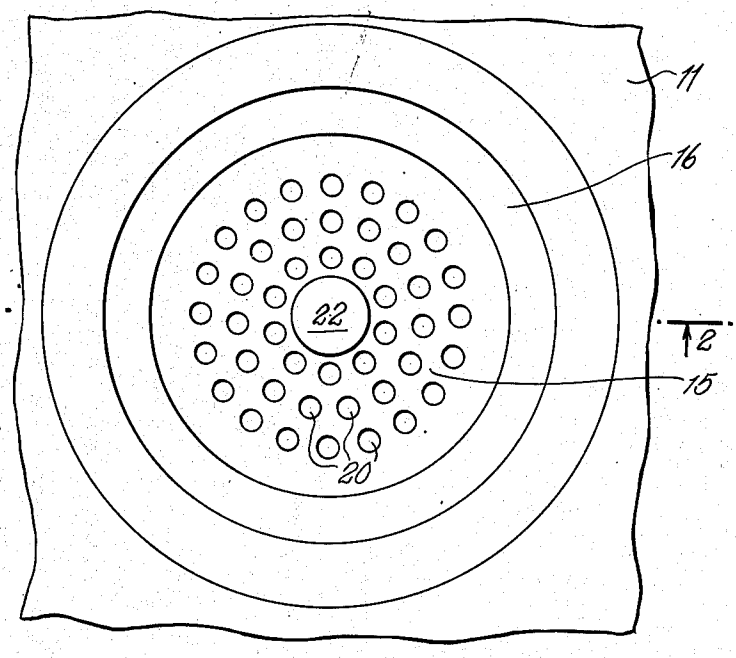


Fig. 1.

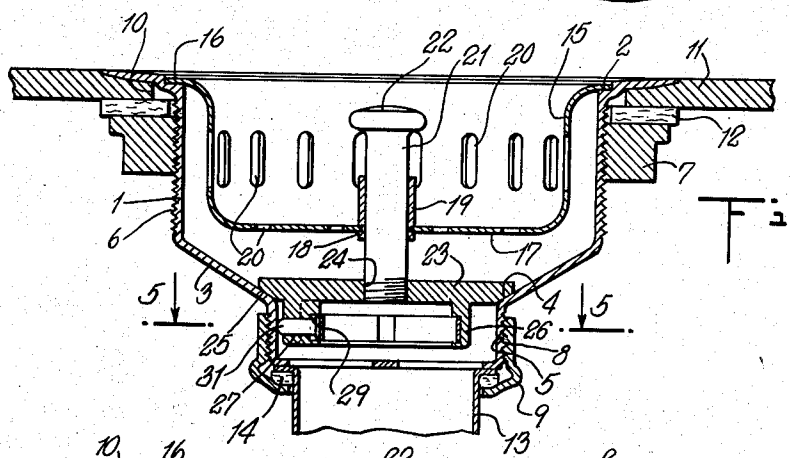


Fig. 2.

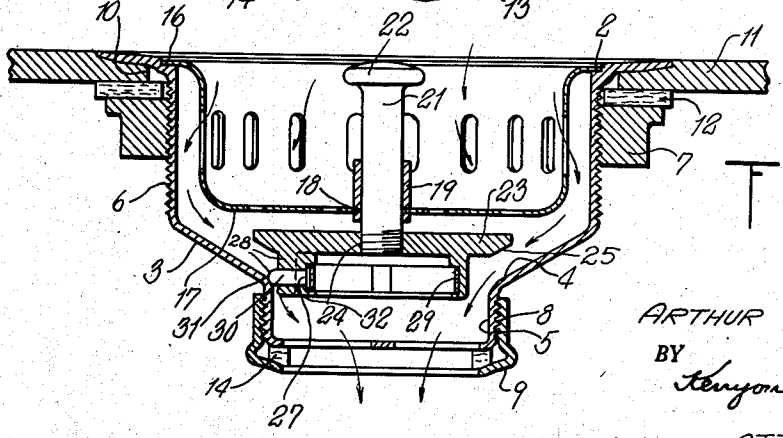


Fig. 3.

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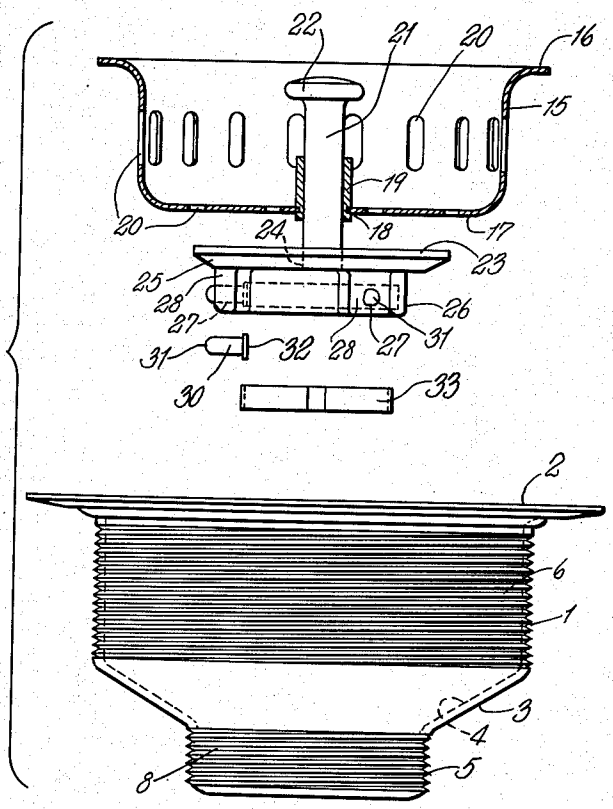
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2 SHEETS—SHEET 2

Fig. 4



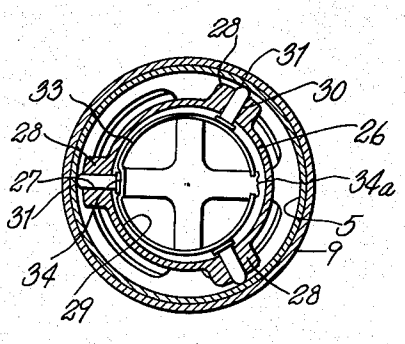


Fig. 5.

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SINK DRAIN DEVICE

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1 Claim. (Cl. 4—287)

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This invention relates to a sink drain device of the kind usually installed in the drain hole of a kitchen sink to function both to strain and collect refuse carried from the sink by the water, and to provide a valve for holding the water in the sink when desired.

Conventionally, a device of this kind includes a flanged receptacle that is locked water-tightly in the drain hole of the sink. This receptacle must provide for thusly locking it in position. It must also have a tail-piece coupling connection so that the outlet of the receptacle may be connected with the tailpiece that goes to the trap beneath the sink. A reduction in the manufacturing cost is effected when this receptacle is integrally formed from sheet material. Often this part is stamped and drawn from sheet brass. The valve action is obtained by a plug that fits a seat in the bottom of the receptacle around the latter's outlet formed by the mouth of the tailpiece coupling connection. This plug is frequently a casting, usually made of brass. A strainer basket rests loosely in the receptacle above the plug and mounts a bushing through which a vertical, reciprocative stud extends with its bottom fastened to the plug. Preferably, this basket is not lifted when lifting the stud, because this action would require a deeper receptacle to provide room for the basket motion that would then be required. These general features are followed in the case of basket strainers commercially produced by many manufacturers.

It is necessary to lock the plug in its up position to drain the sink. This has presented a designing and manufacturing problem which has been practically solved generally by an arrangement requiring turning of the stud. This is inconvenient because the proper locking and unlocking orientations are unknown and can be determined only by trying a number of positions. This must be done by manual manipulation of the stud, frequently with the hand emerged in uncomfortably hot water.

An obvious improvement on the above would be to provide some sort of spring catch which would permit operation of the plug simply by pulling up or pushing down the stud without necessarily rotating it. Prior art patents disclose various schemes for doing this. In all instances, however, these prior art schemes involve serious disadvantages. Some require departure from the economic advantages of using sheet material for making the receptacle and/or strainer basket. Others require complicated parts which are expensive to make and assemble and

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which do not permit easy repair work by a plumber. Still others are objectionable because the design requires lifting of the basket strainer to open the plug, thus requiring an excessively deep receptacle. Heretofore there has been no completely adequate device of this type, and the public is almost universally subjected to the inconvenience of having to rotate the stud back and forth while hunting for the desired position.

In developing the present invention this inventor had as his object, the production of a sink drain device construction permitting application of the device to standardized sinks and plumbing fixtures, permitting the making of the receptacle as an integral piece of sheet material, and which would not involve the use of complicated or expensive parts, such as by requiring lifting of the basket strainer to open the plug, all while providing the convenience of simply moving the stud up and down, without rotating it, to effect operation of the plug. This inventor put particular emphasis on developing a device which could be manufactured about as inexpensively as the conventional type of device now almost universally used in spite of its inconvenience due to the necessity of turning and orienting the stud. He was also particularly concerned with developing a device sufficiently simple to make, assembly simple and servicing simple for a plumber.

With the foregoing in mind, the following, with the aid of the accompanying drawings, discloses a specific example of a sink drain device embodying the present invention. This is done to explain the principles and operation of the invention. Once these are understood, the various features of the invention may be redesigned into other forms by those skilled in the art, and they may even be found applicable to other fields. The mode of constructing the device is obvious to those skilled in the art, once the principles and operation are understood.

In these accompanying drawings:

Fig. 1 is a top view of the device;

Fig. 2 is a vertical section taken on the line 2—2 on Fig. 2;

Fig. 3 is the same view as Fig. 2, the difference being that in Fig. 2 the plug is shown down or closed, while Fig. 3 shows the plug up or open.

Fig. 4 is an exploded view of the more important details of the device; and

Fig. 5 is a cross-section taken on the line 5—5 shown in Fig. 2.

The illustrated device includes a sheet-metal flanged receptacle 1 formed to provide, integrally, a mouth with a countersink 2, and a

funnel bottom 3 having a plug seat 4 with a tailpiece coupling connection 5 depending from this funnel bottom. This tailpiece connection has a smooth generally cylindrical inside and an annular shoulder, formed by the inner peripheral portion of the seat 4, above this smooth inside.

In this illustrated device, the seat 4 also forms the described annular shoulder. If desired, an inwardly extending, annular bead could be formed in the tailpiece connection 5, slightly below the seat 4. In either event, however, the construction permits the flanged receptacle to be stamped and drawn by economical manufacturing methods from a single piece of sheet metal. Sheet brass is preferably used. The threads 6 for the usual lock nut 7 may be cut into the outside of the receptacle. The threads 8 for the usual tailpiece coupling nut 9 may likewise be cut into the outside of the receptacle.

In Figs. 1 and 2 the receptacle is shown installed in the drain hole 10 of a sink bottom 11 with the lock nut 7 screwed up tightly and a leather gasket 12 sealing against leakage. The lock nut 9 is also shown screwed up tightly to establish the connection with the tailpiece 13, of which only the top part is shown, with a leather gasket 14 sealing against leakage at this point.

A sheet metal basket strainer 15 is formed to provide, integrally, an outwardly projecting top flange 16 resting loosely in the countersink 2. This basket strainer has a bottom 17 with a hole 18 formed therein, and a vertical bushing 19 is fastened in this hole 18. This basket strainer may also be stamped and drawn from sheet metal, preferably sheet brass. It has various perforations 20 for performing the straining operation. The bushing 19 may be installed in the basket strainer, by providing the bushing with a bottom end portion of reduced outside diameter just fitting the hole 18, with the remainder thereabove of large diameter, and upsetting the portion of the bushing that projects beneath the bottom of the basket strainer.

Note that the receptacle is not much deeper than the basket. This is possible because the basket does not raise and lower during operation of the plug.

A stud 21 reciprocatively slides within the bushing 18 and is laterally positioned thereby. The top and bottom ends of this stud project beyond the top and bottom, respectively, of the bushing 19. The top of the stud 21 has a head 22 for facilitating its manual manipulation, and a plug 23 is fastened to the bottom end of the stud 21. As illustrated the plug 23 has an internally threaded hole 24 in which the lower end portion of the stud 21 is tightly screwed, this stud portion being externally threaded for this purpose.

The plug 23 has a beveled peripheral bottom portion 25 fitting the seat 4, the interfacing surfaces being smoothly finished to make a good joint. The plug has a depending annular skirt 26 projecting down into the connection 5 and radially spaced therefrom. This skirt 26 has formed through it three radial holes 27 spaced circumferentially thereof in a generally uniform manner, with each hole surrounded by an outwardly projecting pad 28 to make the hole longer. The inside of the skirt 26 is formed to provide an annular groove 29 that is registered with the three holes 27. This plug, complete with its skirt 26 and pads 28, may comprise a casting,

preferably made from brass. The plug of most conventional arrangements, is also a casting. The peculiar shape of this plug has not increased its manufacturing cost as compared with the usual cost.

Similar pins 30 are positioned through the holes 27, one for each hole. Each pin has a smoothly rounded nose 31 bearing on the smooth inside of the connection 5, and a flanged base 32 constructed to engage the bottom of the groove 29 when the nose 31 is free from the inside of the connection 5 and the pin is moved outwardly as far as its base 32 permits. The insides of the bases 32 of all the pins are engaged by a generally cylindrical, axially split, spring ring 33. This ring is fitted, under radial compression, in the groove 29, having proper dimensions for this, and the spring thus biases all three of the pins outwardly. The ring 33 has an inwardly extending radial depression 34 fitting around the base 32 of one of the pins and holding the spring against rotation. This keeps the split 34a of the ring from registering with the base of any of the springs. This spring is made from metal that is not easily corroded. It may be made from brass strip of high temper, or other metal of adequate elasticity.

The simplicity of this plug assembly makes the manufacturer's assembling process very simple. Assembly of the parts is considered so obvious as to eliminate the need for a description.

In use, the handle head or knob 22 is merely grasped and quickly lifted. This may be done without lifting the basket strainer, the vertical position of this strainer remaining fixed. When the plug 23 is thus lifted, the nose 31 of each of the pins 30 clears the annular shoulder, formed in the illustrated form by the seat 5, whereupon the three pins all spring out. Then the three pins hold the plug in its up position. To stop draining it is only necessary to push down on the head 32, the downward shape of the seat 4 causing the three pins to be wedged inwardly and slide down the smooth inside of the connection 4. Since there are three pins the plug is automatically centered so that it seats itself precisely. The three pins provide a tripod effect. The smoothly rounded noses 31 of the pins slide easily on the smooth substantially cylindrical inside of the connection 5, so little up or down force is required to operate the device.

Whenever desired, the entire basket strainer can be entirely removed by continuing to lift on the head or knob 22. The loosely positioned basket 5 can be entirely pulled from the receptacle. If any of the pins become worn or broken, or should there be a failure of the spring 33, anyone can easily snap the spring 33 from the groove 29 in the skirt 26 depending from the plug. This releases all of the parts so that any of them may be easily replaced. Due to the simplicity there is very little need for servicing them.

As previously explained, an annular head may be easily formed in the sheet metal connection 5, upwardly clear from the zone required for the threads 8 and beneath the plug seat 4. In that event this annular head would provide an annular shoulder up over which the various pins may snap. By properly positioning such a head, the plug may be made to snap to its closed position, and it will be held there by the action between the rounded pin noses and the head. The spring 33 provides the force. This is the same action as is obtained by the pins snapping up over the shoulder formed by the seat.

It is now apparent that the illustrated form of the invention accomplishes all of this inventor's objectives.

I claim:

A sink drain device including, in combination, a flanged receptacle formed to provide integrally a mouth having a countersink and a funnel bottom having a plug seat with a tailpiece coupling connection depending therefrom with a smooth, generally cylindrical, inside and an annular shoulder thereabove; a basket strainer formed to provide an outwardly projecting annular top flange resting loosely in said countersink and having a bottom with a hole centrally located therein; a vertical bushing fastened in said hole; a reciprocative stud sliding in said bushing and laterally positioned thereby with its top and bottom ends projecting therebeyond; a plug fastened to the bottom end of said stud and fitting said seat and having a depending annular skirt projecting down into said connection and radially spaced therefrom and having a plurality of radial holes therethrough spaced circumferentially thereof in a generally uniform manner with this skirt having an annular groove on its inside registering with said holes; a pin positioned through each of said holes, each with a smoothly rounded nose bearing on said inside of said connection and having a flanged base constructed to engage the bottom

of said groove, when said nose is free from the inside of said connection; and a generally cylindrical and axially split spring ring fitted in said groove and engaging said bases of said pins and spring biasing said pins outwardly and having a depression fitting around the base of one of said pins and holding said spring against rotation.

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