Dec. 30, 1947. R. H. BROADMAN 2,433,423

STRAINER FOR CELLAR DRAINS

Filed March 29, 1945

Fig. 1

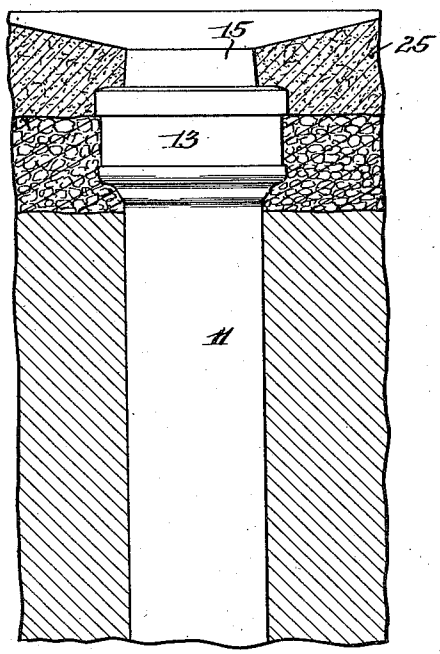


Fig. 2

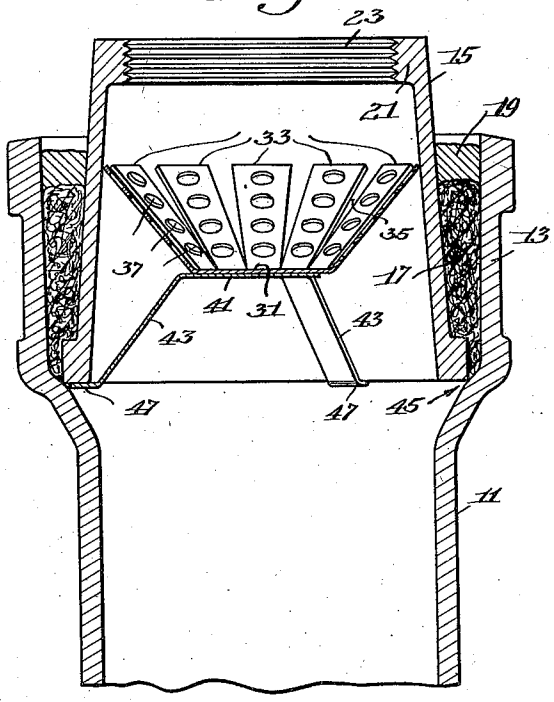
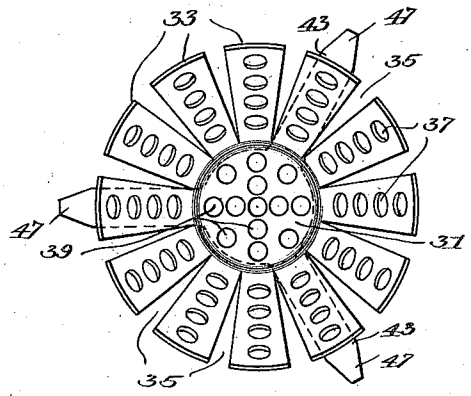


Fig. 3



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Patented Dec. 30, 1947

2,433,423

UNITED STATES PATENT OFFICE

2,433,423

STRAINER FOR CELLAR DRAINS

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Application March 29, 1945, Serial No. 585,453

4 Claims. (Cl. 4—292)

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This invention relates to a sieve or strainer useful, for example, in cellar drains and in other locations. An object of the invention is the provision of a generally improved and more satisfactory sieve or strainer of this kind.

Another object is the provision of a sieve of inexpensive and sturdy construction, which may be readily installed in a pipe of a type commonly used for cellar drains but having no provision for installation of a sieve.

Still another object is the provision of a sieve which can be installed readily in any pipe (whether a cellar drain or elsewhere) which has an opening somewhat restricted in comparison with the diameter of the pipe beyond the opening.

A further object is the provision of a sieve which is easy to install but difficult to remove, so that children and other unauthorized persons will be deterred from attempting to remove it.

A still further object is the provision of a novel method of manufacturing and installing a sieve in a pipe of a type not originally having any provision for a sieve.

These and other desirable objects are accomplished by the construction disclosed as an illustrative embodiment of the invention in the following description and in the accompanying drawings forming a part hereof, in which:

Fig. 1 is a vertical section through a fragment of a cellar floor and a drain pipe installed therein, to show a typical form of existing construction with which the present invention is particularly useful;

Fig. 2 is a vertical section taken centrally through a preferred form of the sieve of the present invention, showing it installed in a drain pipe of the type shown in Fig. 1; and

Fig. 3 is a plan of the sieve shown in Fig. 2, removed from the drain.

The same reference numerals throughout the several views indicate the same parts.

The provision of a sieve in a cellar drain not originally designed for receiving a sieve, presents special problems and difficulties. The sieve or strainer of the present invention is designed particularly to overcome these problems and difficulties, and so is particularly useful for cellar drains, although obviously it may be used in other locations also. While many cellar drains are equipped, upon initial installation, with sieves or strainers of various types, it is nevertheless true that there are a large number of cellar drains in use at the present time, and still being installed, in which no provision is made for a sieve or

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strainer, and in which the construction is such that the installation of any type of sieve or strainer existing prior to the present invention would be difficult or unsatisfactory.

For example, as illustrative of one of the types of cellar drains used in large quantities, there is shown in Figs. 1 and 2 the upper end or terminal portion 11 of a drain pipe, usually of cast iron, having a bell 13 at its upper end. In this bell 13 is placed a ferrule or thimble 15, held in place by the conventional calking 17 of oakum or the like, retained by the filling of lead 19. This ferrule or thimble 15, in a form very commonly used in many localities, has an internal diameter slightly tapering, as shown in Fig. 2, increasing from top to bottom, and at its upper end the opening is considerably restricted by an inwardly extending flange 21 carrying internal screw threads 23. Ordinarily the bell 13 and ferrule 15 are buried in the concrete 25 of the cellar floor, the upper edge of the ferrule being substantially flush with the top of the concrete floor, as shown in Fig. 1, where the floor is sloped toward the drain to provide for easy drainage of any water in the cellar.

With a drain pipe of this type which is in wide use, it is seen that there is a considerable problem in installing a sieve or strainer, no provision for such sieve or strainer being made in the design of the parts. A plug can be screwed into the screw threads 23 if it is desired to close up the drain, but if the drain is to be left open, there has been no easy way (prior to the present invention) of providing a sieve which would not interfere with placing or removing a plug in the screw threads 23. Since the ferrule 15 is buried in the concrete floor, it obviously is not practical to break up the floor around the ferrule and remove the ferrule to replace it by a different type of ferrule having provision for a sieve.

According to the present invention, a sieve is provided which may be readily installed in a drain of this type, and which, when once installed, can be removed if necessary, but only with some difficulty, so as to discourage removal by children playing in the cellar, or other unauthorized persons. The sieve has a body formed from a sheet of flexible resilient material, preferably sheet metal or plastic material with a reasonable amount of springiness in it. The body is of generally frusto-conical shape, including an approximately flat central portion or bottom 31, from the margins of which the fingers 33 rise obliquely. These fingers are preferably integral with the bottom 31 and are bent up-

wardly from the plane of the bottom in the manufacturing operation, after the necessary radial cuts are made in the sheet of material. Sufficient material is cut out between the fingers 33 so that there are substantial spaces 35 between the fingers, as shown, when they are at their normal positions, thus permitting the fingers to be bent upwardly readily, compressing them so as to reduce the diameter of the outer ends of the fingers. The cuts or spaces 35 also serve to allow passage of water through the sieve when it is installed in its normal position. These passages are supplemented by perforations 37 in the fingers, and other perforations 39 in the bottom 31.

Associated with this basket-like body of the sieve is a stabilizing or anchoring member to assist in holding the sieve in proper position in the drain pipe. The stabilizing or anchoring member may be formed integrally with the sheet metal from which the bottom 31 and fingers 33 are formed, but preferably is in the form of a separate member soldered, welded, or riveted to the bottom 31 of the body. In the preferred form here shown this stabilizing or anchoring member is, like the body itself, formed of flexible and resilient material such as sheet metal, and comprises a flat central portion 41 secured to the underside of the bottom member 31 and provided with perforations alined with or matching the perforations in the member 31. From this body 41 spider-like arms or fingers 43 extend obliquely outwardly, away from the fingers 33 of the sieve body, and are long enough to come into contact with the walls of the pipe in which the sieve is installed, at points spaced axially from the ends of the fingers 33. Three such arms 43 are preferably employed, as shown, although any number could be used. The contact of these arms with the walls of the pipe holds the main body 31, 33 against cocking or tilting in the pipe, thus stabilizing it. Moreover, when the ferrule 15 of the drain pipe is installed in the bell at the top of the pipe 11, there is usually a substantial structural variation in the otherwise smooth interior surface of the pipe, this structural variation being usually in the form of an annular groove as indicated at 45, just below the bottom of the ferrule 15. The extremities 47 of the arms 43 are preferably bent to extend approximately perpendicularly to the axis of the pipe, and are somewhat pointed as shown, so that they will extend into the annular groove 45 or other structural variation in the pipe, to anchor the sieve against accidental axial movement along the pipe in which it is installed. The reason for making the extremities 45 somewhat pointed is so that these points will dig into and through any dirt or refuse which may have accumulated in the annular groove 45, if the sieve is installed in a drain pipe which has already been in use for a considerable time.

In practice, if the householder desires to have a sieve installed in a drain of this general type, the sieve of the present invention is readily installed by first passing the stabilizing or anchoring legs 43 through the restricted opening formed by the screw threads 23 (momentarily bending the legs 43 inwardly to compress them so as to pass through the restricted opening) and then the main body of the sieve is passed through the opening by exerting pressure downwardly on the flat bottom 31 thereof. The downward pressure thus exerted will press the oblique resilient fingers 33 against the restricted opening with sufficient force to deflect these resilient fingers 33 inwardly, compressing them to reduce the diameter of the outer ends of the fingers until they will go through the restricted opening 23. Immediately after passing through the restricted opening 23, the fingers 33 spring outwardly again to fill the full diameter of the ferrule 15. As the sieve is pushed further down the ferrule 15, the ends of the fingers 33 ride along the inner surface of the ferrule in frictional contact therewith, while the extremities 47 of the resilient legs 43 likewise ride along the inner surface of the ferrule, until they come to the structural variation on which the device is to be anchored (such as the annular groove 45) whereupon the extremities 47 contact with such structural variation and resist further axial movement of the sieve. For instance, if the structural variation is an annular groove, as is usually the case, the extremities 47 of the legs 43 will snap into this annular groove immediately upon passing the lower end of the ferrule 15, and thus will hold the sieve in proper position.

If necessary, the sieve can be removed from the drain by inserting long-nose pliers or another suitable tool into the drain opening, and grasping the fingers 33 and bending them inwardly beyond their elastic limit, reducing the diameter of the sieve body to such an extent that it can be yanked upwardly out through the restricted opening of the drain pipe. Such removal, however, requires special tools and special skill, and ordinarily cannot be accomplished by children playing in the cellar. A sieve of this kind is extremely valuable in houses where children are allowed to play in the cellar, because experience shows that children are very likely to attempt to place pieces of coal, marbles, or other toys in the cellar drain, not only clogging up the drain but also resulting in loss of the marbles or toys, all of which is prevented by the installation of a sieve of this kind.

The sieve would, of course, be manufactured in different sizes to fit the different standard sizes of cellar drain pipes. In most cellar drains of the general type here referred to, the diameter of the screw threads 23 is about two inches to three inches, and the sieve of the present invention may be made in two or three standard sizes which will fit the great majority of drains of this general type.

It is seen from the foregoing disclosure that a construction is provided which admirably fulfills the above-mentioned objects of the invention. It is to be understood that the foregoing disclosure is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the construction may be varied within the scope of the appended claims.

What is claimed is:

1. A sieve for insertion in a drain pipe having a restricted opening and being of larger diameter beyond said restricted opening and having an annular groove spaced inwardly from said opening, said sieve including a body of perforated sheet material having a relatively rigid central portion of smaller size than the size of said restricted opening and having substantially frusto-conical sides formed of a plurality of portions sufficiently flexible so that they may be compressed to decrease the diameter of the body so as to pass through said restricted opening, so that said body may be placed in said pipe between said restricted opening and said annular groove, and a resilient anchoring member connected to said body and

extending therefrom in a direction away from said restricted opening and tending to expand to a diameter engaging said annular groove in the drain pipe.

2. A sieve for insertion in a pipe, said sieve including an approximately frusto-conical body of sheet material having an approximately flat central portion and oblique walls formed of flexible resilient fingers extending obliquely upwardly from the edges of said central portion and laterally separated from each other throughout substantial portions of their lengths so that said fingers may be bent inwardly to reduce the diameter of the body and will tend to spring outwardly to tend to fill the cross section of the pipe in which the sieve is inserted, and a stabilizing member connected to said central portion of said body and extending obliquely downwardly therefrom in a direction opposite to the direction in which said resilient fingers extend, for contact with the walls of the pipe in which the sieve is inserted at a point axially spaced from the maximum diameter of said body.

3. A construction as described in claim 1, in which said anchoring member includes a plurality of sheet metal arms having oblique portions extending from said central portion of said body toward said annular groove and having end portions bent relatively to said oblique portions so as to extend approximately in a radial direction in a plane perpendicular to the axis of said drain pipe, said end portions being pointed and adapted to dig into any dirt accumulated in said annular groove.

4. A strainer for insertion in a drain pipe of the type having a restricted entrance opening, a portion of larger diameter than said opening for a substantial distance inwardly from said opening, and an annular groove of still larger diameter at the inner end of said portion, said strainer being adapted to be seated in said portion between said restricted entrance opening and said annular groove, said strainer including a body of perforated sheet metal having a relatively rigid central portion of small diameter than the size of said restricted entrance opening of the pipe in which said strainer is to be installed and having inclined side walls slitted to form resilient fingers collectively compressible to a diameter capable of passing through said restricted entrance opening and tending after passing therethrough to expand to a larger diameter, said side walls being inclined in a direction toward said entrance opening when said body is installed in said pipe, said strainer further including an anchoring portion mounted on said central portion of said body and having a plurality of resilient arms inclined in a direction away from said entrance opening and terminating in ends adapted to engage in said annular groove.

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