

# United States Patent

McNally

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## [54] FLOOD ALARM

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[51] Int. Cl. .... **G08b 21/00**

[58] Field of Search ..... 340/239, 240, 243, 245-247, 340/242, 272; 200/81.9, 83; 73/155, 228; 9/9; 102/7

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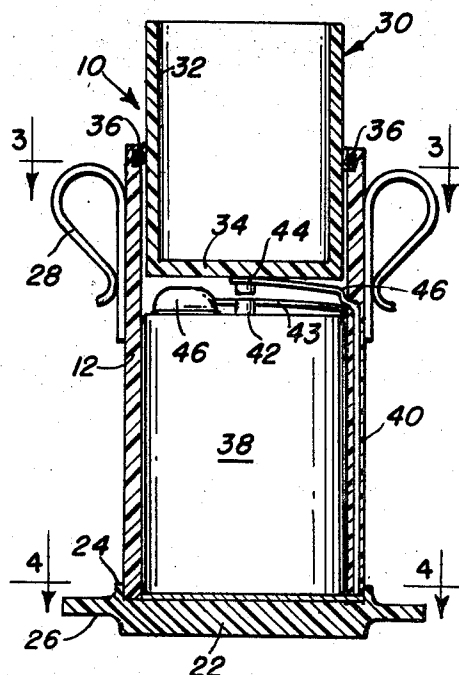
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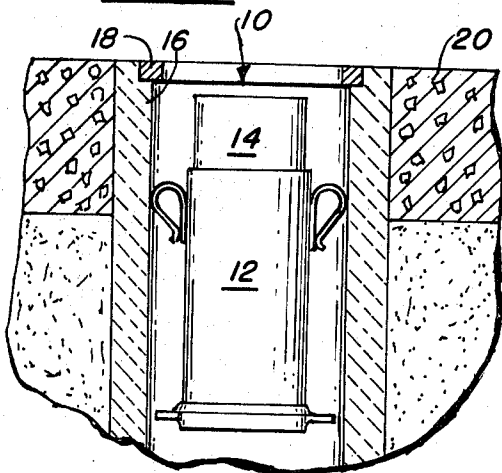
## [57] ABSTRACT

An alarm for indicating a sudden flow of liquid such as water or the like either into or out of a basement drain or the like at a predetermined rate of flow, the alarm being inoperable when the flow of liquid into the drain is at a predetermined low rate.

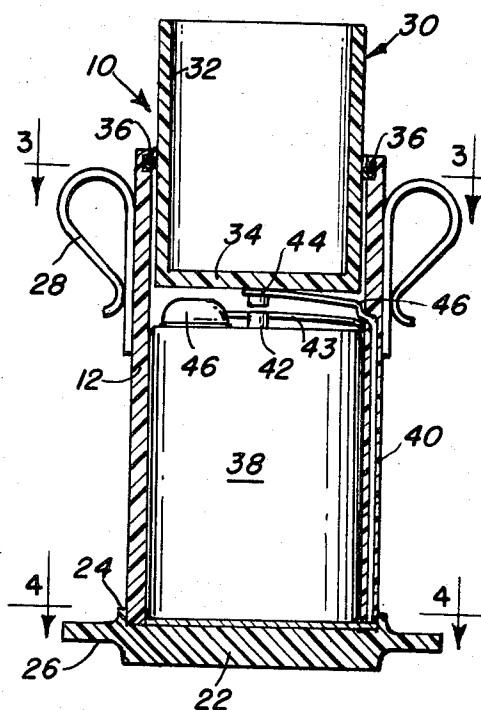
**5 Claims, 5 Drawing Figures**



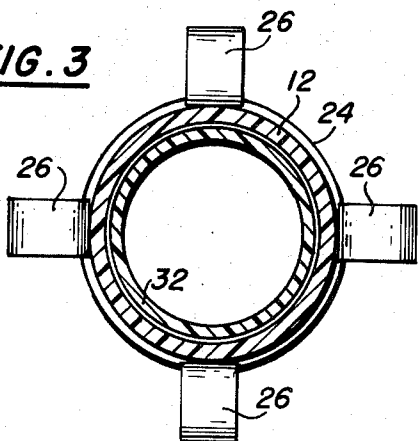
**FIG. 1**



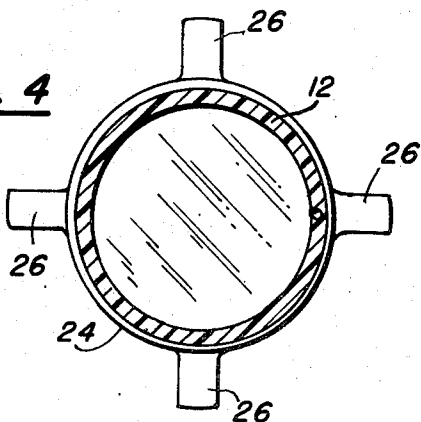
**FIG. 2**



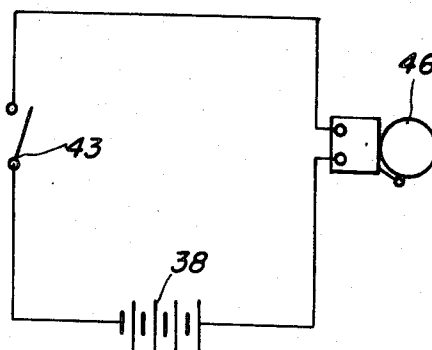
**FIG. 3**



**FIG. 4**



**FIG. 5**



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## FLOOD ALARM

## SUMMARY OF THE INVENTION

A principal object of the invention is to provide an alarm system for indicating abnormal flow of liquid such as water or the like into the floor drain of a basement or the like.

Another object of the invention is to provide an alarm system which is operable to detect and report either a flow into the drain at a predetermined high rate of flow or a drain back-up.

A further object of the invention is to provide an alarm system which is inoperative when water flows into the drain at a predetermined normal rate but is activated when a sudden surge of water enters the drain either through the grate or as a back-up from the sewer system.

Another object of the invention is to provide an alarm apparatus in accordance with the preceding apparatus which is easy to install and which is characterized by ease and facility of manufacture.

These and other objects of the invention will become apparent as the description proceeds with reference to the accompanying drawing wherein:

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 is an elevational sectional view of an alarm system made in accordance with the present invention illustrated in operative position in a floor drain pipe;

FIG. 2 is an enlarged elevational sectional view of the alarm itself showing the relation of the several parts thereof;

FIG. 3 is a sectional plan view taken substantially on line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken substantially on line 4—4 of FIG. 2; and

FIG. 5 is a schematic view illustrating the electrical circuit for the alarm of the present invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and more particularly to FIG. 1, the alarm of the present invention is indicated generally by reference numeral 10 and includes a housing 12 within which is slidably received a receptacle 14. The alarm is placed within a drain pipe 16 having a conventional grate 18. In the illustrated embodiment, the drain pipe is mounted in a concrete floor 20.

Referring now to FIG. 2, the alarm 10 has at the lower end thereof a cap 22 having an upwardly extending annular ridge 24 dimensioned snugly to receive the lower edge of the outer periphery of the hollow cylindrical housing 12. In the alternative, the ridge 24 may be threadedly received on the outer periphery of the cylindrical housing. The cap 22 is provided with a plurality of circumferentially spaced radially outwardly extending lugs 26 which determine the position of the lower end of the housing 12 within the drain pipe 16. The position of the upper end of housing 12 is determined by a plurality of circumferentially spaced spring clips 28, the outer ends of which snugly engage the inner periphery of the drain pipe 16, as illustrated in FIG. 1.

Referring now to FIG. 2, a receptacle 30 is slidably mounted within the housing 12 and is in the form of a hollow cylindrical cup having a side wall 32 and a bottom wall 34. A ring seal 36, which may be an O-ring or the like, is mounted at the upper edge of the inner periphery of the housing 12 in snubbing engagement with the outer periphery of the cylindrical wall 32.

A battery 38, which may be of the dry cell type, is mounted within the housing 12 in the position illustrated in FIG. 2. Preferably, the housing 12 is made of a suitable dielectric material such as plastic or the like, but has imbedded therein a conductor 40 which is in electrically conductive relation to the bottom of the battery 38 which has at the upper end thereof a terminal 42.

A contact 44 is mounted at the free end of a spring 46. The contacts 42 and 44 together constitute a switch 43.

According to an important feature of the present invention, the contacts 42 and 44 are engaged for energization of an audible alarm 46 when liquid at a predetermined rate of flow enters the drain pipe 16 and fills the receptacle 30. When this occurs, the contact 44 engages the contact 42 thus effecting energization of an electric circuit including the audible alarm 46 which may be a buzzer, bell, or the like.

It will be noted that water drainage at a normal rate will flow down through the annular space between the housing 12 and the drain pipe 16 and will not enter the receptacle 30. Thus, the alarm system of the present invention will not be activated when fluid flows through the drain pipe at a normal flow rate but will only be activated when fluid flows across the floor at a sufficient rate of flow to enter the receptacle 30. It will be noted that the present alarm system will be operative also in the event of inadvertent back-flow of the drainage system, filling of the receptacle 30 being effected when the back-fill reaches the top edge of the receptacle.

The alarm system of the present invention exhibits important advantages over alarm systems heretofore known. For instance, the present system is not responsive merely to a liquid level but is responsive to a drastic change in rate of flow of liquid above the normal drainage rate. Applicant does not intend to be limited by the illustrated embodiment since it is merely representative of his inventive concept. It is contemplated that the present invention be used to detect a change in rate of flow of any liquid and is not by any means limited to drain water.

I claim:

1. An alarm system for detecting a sudden flow of liquid at a relatively large rate of flow comprising a housing adapted to be snugly received in a floor drain pipe in spaced relation to the sides thereof, said housing including a compartment for a dry cell battery and a cup slidably mounted in superposed relation to a switch, said cup being normally biased upwardly but being movable downwardly to engage said switch, said switch being connected in series with an audible alarm so that when a liquid such as water or the like flows at a predetermined rate, it will flow into said cup, close said switch and energize said audible alarm.

2. A system in accordance with claim 1 wherein a cap is provided for the lower end of said compartment of the housing so that the battery may be replaced when required.

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3. A system in accordance with claim 2 wherein said cap is provided with a plurality of circumferentially spaced radially outwardly extending tangs for mounting the housing in spaced relation to the walls of the drain pipe.

4. A system in accordance with claim 3 wherein a plurality of spring clips are mounted in circumferentially spaced relation on the outer periphery of the

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upper end of said housing to cooperate with said tangs in maintaining the housing in spaced relation to the side walls of the drain pipe.

5. A system in accordance with claim 1 wherein said audible alarm is positioned between said battery and said cup.

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