# United States Patent

**Donalson**

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## [54] PLUMBING GRATE FIXTURE


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[52] **U.S. Cl.**.....**210/163,** 210/463
[51] **Int. Cl.**.....**B01d 35/02**
[58] **Field of Search**.....210/163, 164, 165, 166, 463



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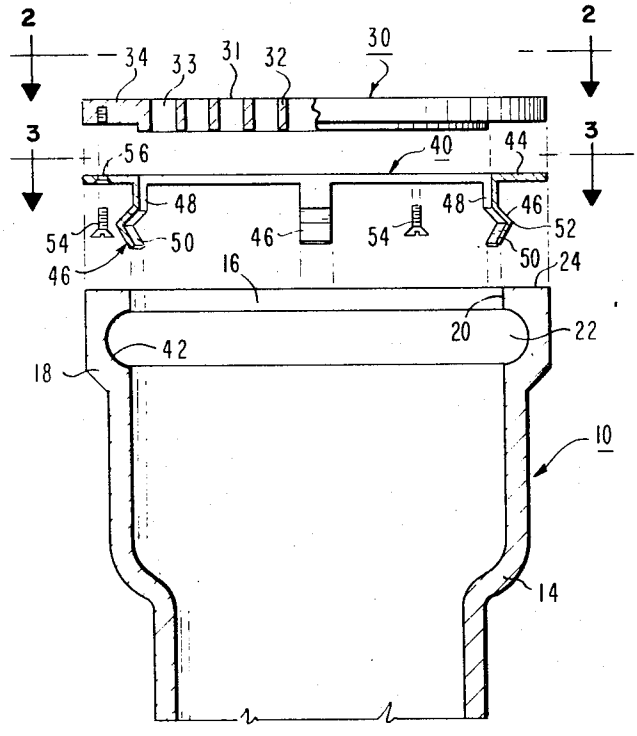
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[57] **ABSTRACT**

A grate fixture adapted to cover a drainpipe having a bell-mouthed flaring with a planar edge and a circular groove near the edge. The fixture provides a grate portion to cover the mouth of the pipe and to allow liquids to flow therethrough. Releasable securing means extend downwardly into the opening of the pipe and removably secure the fixture to the pipe.


**1 Claim, 6 Drawing Figures**



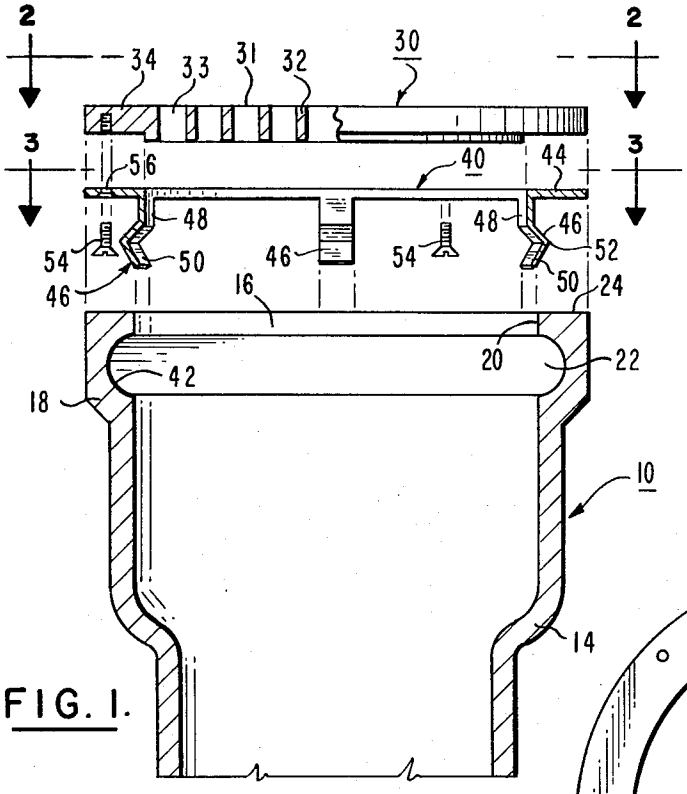



FIG. 1.

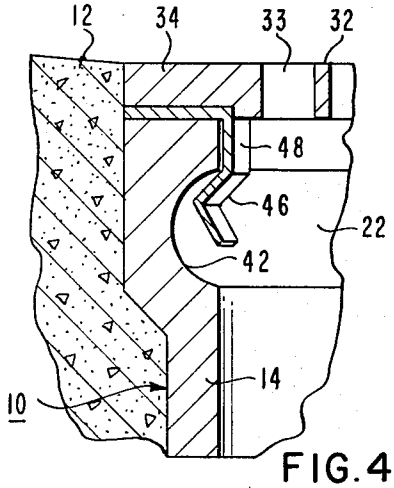



FIG. 4

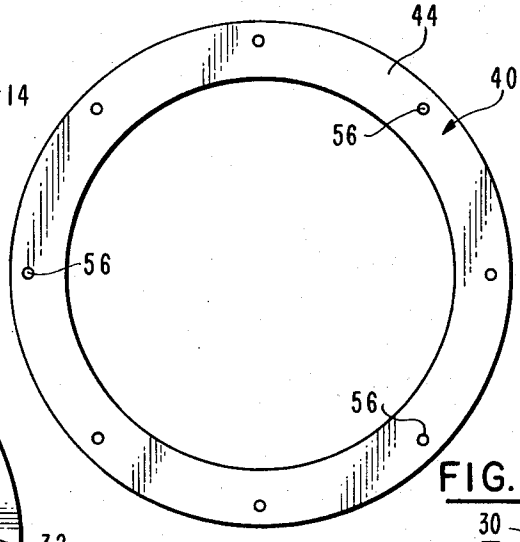



FIG. 3.

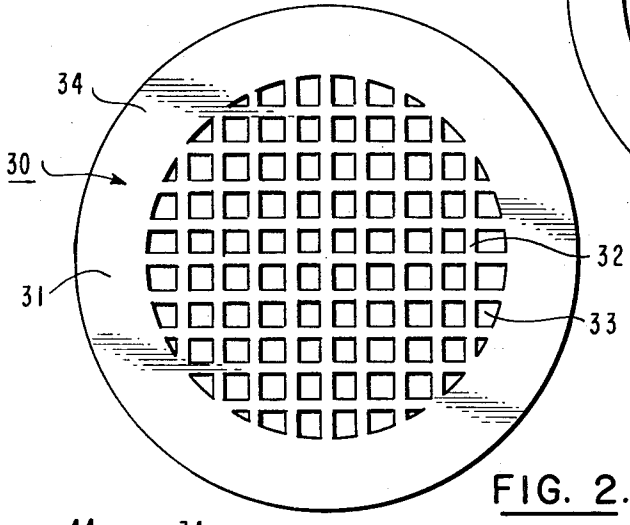



FIG. 2.

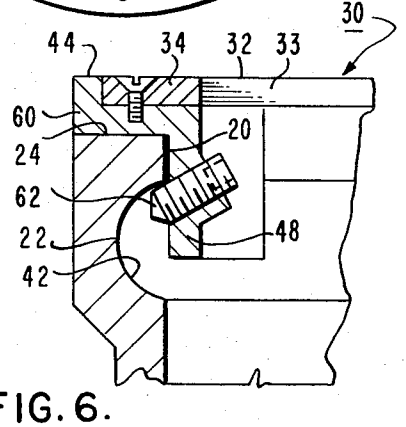



FIG. 6.

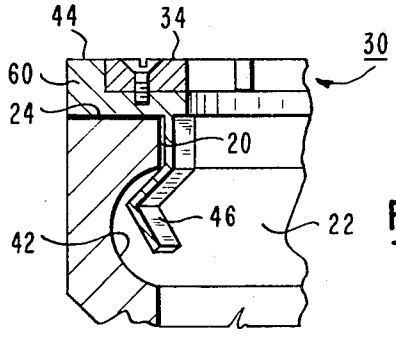



FIG. 5.

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# PLUMBING GRATE FIXTURE

## BACKGROUND OF THE INVENTION

Many commercial establishments such as cafeterias, laundries, car washers, etc., employ a great number of floor drains each having a grate removably secured to the downwardly extending drainpipe. A common material used for making such drainpipes is cast iron. Commercially used grates typically include a grate portion having an outer diameter slightly less than the inner diameter of the mouth of the drain pipe. Suitably inclined legs extend from the bottom face of the grate portion to rest on the inner wall of the drainpipe.

The drawbacks of such grates which are in common use are well known to those skilled in the art. First the setting of the grate requires skilled labor, prior to the pouring of the cement and after the cement has been set. Second, since the edges of cast iron pipe are ordinarily not as smooth as it is often desired, floor drains using such grates fail to provide a flush surface which blends with the surrounding floor surface. To provide an acceptable blend, the edge of the cast iron pipe is often leveled with a suitable grinding tool. Third, subsequent to the installation, the edge of the drainpipe is likely to show rust which detracts from the clean appearance desired in such commercial establishments.

## SUMMARY OF THE INVENTION

It is a main object of the present invention to provide a new and improved grate fixture which avoids the above mentioned and other drawbacks of commercial grade grates presently used with drain floor pipes.

It is another object of the invention to provide a relatively inexpensive grate fixture which can be easily installed after a cement floor is poured, which provides a smooth blending surface with the surrounding floor surface, which is relatively inexpensive to manufacture, and which hides the drainpipe from view thereby affording an attractive appearance.

The grate fixture of this invention is adapted for use in conjunction with a hub drain section which is commonly used in putting up drainpipe.

The grate fixture is adapted to cover a hub section having a central opening, an outer edge lying in the plane of the opening, and a circular groove in its inner wall near the edge.

The fixture itself comprises a top member providing a grate portion adapted to cover the central opening and to allow liquids to flow therethrough into the drainpipe, and a marginal circular flange which is coextensive with the grate portion and which has an outer diameter substantially equal to the outer diameter of the edge. Releasable securing means extend substantially at right angles from the top member so that, in use, the securing means removably secure the fixture near or to the wall of the groove.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be fully and comprehensibly understood from a consideration of the following detailed description when read in connection with the accompanying drawing, in which:

FIG. **1** is a sectional view in elevation of one embodiment of the grate fixture, with its constituent elements disassembled, and disposed adjacent to the mouth of a hub section;

FIG. **2** is a top view of the top member on line **2—2** in FIG. **1**, showing the grate portion and its adjoining marginal circular flange;

FIG. **3** is a top view of the coupling member on line **3—3** in FIG. **1**, adapted to releasably secure the top member to the inner wall of the hub section;

FIG. **4** is an enlarged fragmentary sectional view illustrating the position of the grate fixture inside the hub section and the manner of its blending with the adjoining floor surface;

FIG. **5** is a fragmentary sectional view of a modified embodiment of the coupling member shown in FIG. **1**; and

FIG. **6** is a fragmentary sectional view of yet another embodiment of the coupling member.



In the embodiments shown in the drawing there are provided a pair of complementary members one of which is a coupling element adapted to become removably attached to the inner wall of a hub section and to provide a support surface for a top cover element which has a circular area sufficient to cover the outer diameter of the hub section.

Reference is now had to FIGS. **1–4** of the drawing for a detailed description of one embodiment of this invention.

A drainpipe **10** is shown embedded in a concrete floor having a surface **12**. Pipe **10** is terminated with a hub section **14** defining a central opening or mouth **16** in an enlarged tubular portion **18** which affords a bell-mouthed flaring having an inner wall **20** in which there is a circular groove **22**. A planar annular edge **24** forms the end wall of hub section **14** and lies in the plane of mouth **16**. Hub sections such as **14** are standard drain sections used commercially for inter-coupling drainpipe as will be apparent to those skilled in the art. In use, the plane of edge **24** is positioned below the floor surface **12** by a distance sufficient to accommodate the grate fixture of this invention which is generally designated as **30**.

Fixture **30** includes a top or cover member **31** defining a grate portion **32** having a circular area substantially equal to the circular area of mouth **16**, and a marginal annular flange **34** which is coextensive with the grate portion **32** and which has an outer diameter substantially equal to the outer diameter of the annular edge **24**. Fixture **30** also includes a coupling device which is generally designated as **40** and which is adapted to removably secure the cover **31** to the inner wall **20** of hub **14** and preferably to the inner wall **42** of groove **22**.

In the embodiment shown in FIGS. **1–4**, coupling device **40** includes a ring **44** having an outer diameter substantially equal to the outer diameter of the annular flange **34**. Extending downwardly from ring **44** are a number (say four) of resilient locking or spring members **46**. Each spring member **46** has an arcuate downwardly extending portion **48** and a V-shaped locking finger **50** having an outwardly extending apex **52**. A plurality of screws **54** releasably secure ring **44** to the marginal circular flange **34** through openings **56**.

In use, grate fixture **30** is assembled by tightening screws **54** and with the use of pressure it is inserted into the mouth **16** whereupon the resilient spring members **46** will first move slightly inwardly to allow the apexes **52** to pass through the inner wall **20**. Thereafter the locking fingers **50** will lodge inside groove **22** as best illustrated in FIG. **4**. The upper surface of fixture **30** will then provide a smooth blend with the surrounding floor surface **12** as well as hide from view the cast iron hub **14**. To remove fixture **30** the opposite procedure will be followed, i.e., fixture **30** will be pulled out by applying suitable tension thereto. The drain liquids will flow downwardly through the openings **33** in grate **32** in the usual manner. The lattice of openings **33** can assume, of course, various configurations.

The embodiment shown in FIG. **5** is in all respects similar to the embodiment of the grate fixture shown in FIG. **1** except that ring **44** is now provided with a vertically extending cylindrical portion **60** having an outer diameter substantially equal to the outer diameter of edge **24** and an inner diameter slightly greater than the outer diameter of flange **34**.

In some construction sites the floor surface **12** is not perfectly horizontal and accordingly it may be desired for the grate fixture **30** to include vertical leveling means associated therewith. Such means are provided in the embodiment shown in FIG. **6** which is in all respects similar to the embodiment shown in FIG. **5** except that the tubular portion **48** is extended further downwardly to cover at least a portion of groove **22** and to allow an inclined set screw **62** to engage wall **42** of groove **22**. In use, a suitable Allen wrench inserted through an opening **33** in the grate **32** can cause set screw **62** to move inwardly into or outwardly from groove **22**.

The materials used to fabricate the grate fixture **30** can include copper, bronze, stainless steel and the like to make the fixture strong, non-corrosive and durable.

It will be appreciated that the grate fixture may be fabricated in a manner as to form an integral unitary piece instead of the dual construction illustrated in the drawing. Other modifications will readily suggest themselves to those skilled in the art and all such modifications are intended to be covered by the claims attached hereto.

What I claim is:

1. A floor drain comprising a hub section of a drainpipe having a bell-mouthed flaring defining a central opening, a planar edge lying in the plane of the opening, and a circular groove in the inner wall of said flaring near said edge,

a grate fixture adapted to be mounted in said drainpipe for support exclusively by the drainpipe, said fixture comprising:

a top member defining:

a grate portion to cover said opening and to allow liquids to flow therethrough into said drainpipe, and



a marginal annular flange coextensive with said grate portion,

said flange having an outer diameter greater than the inner diameter of said opening, and said flange being supported by said planar edge,

screw means angularly extending downwardly from the bottom surface of said top member, said screw means:

a. securing said top member to said inner wall near said groove,

b. having a longitudinal axis which forms an acute angle with the vertical, and

c. being adapted to move into and out of said groove to thereby removably secure said fixture to said drainpipe at desired angular inclinations relative to the horizontal thereby causing said gate portion to move up or down relative to the surface of the floor around said floor drain.

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