

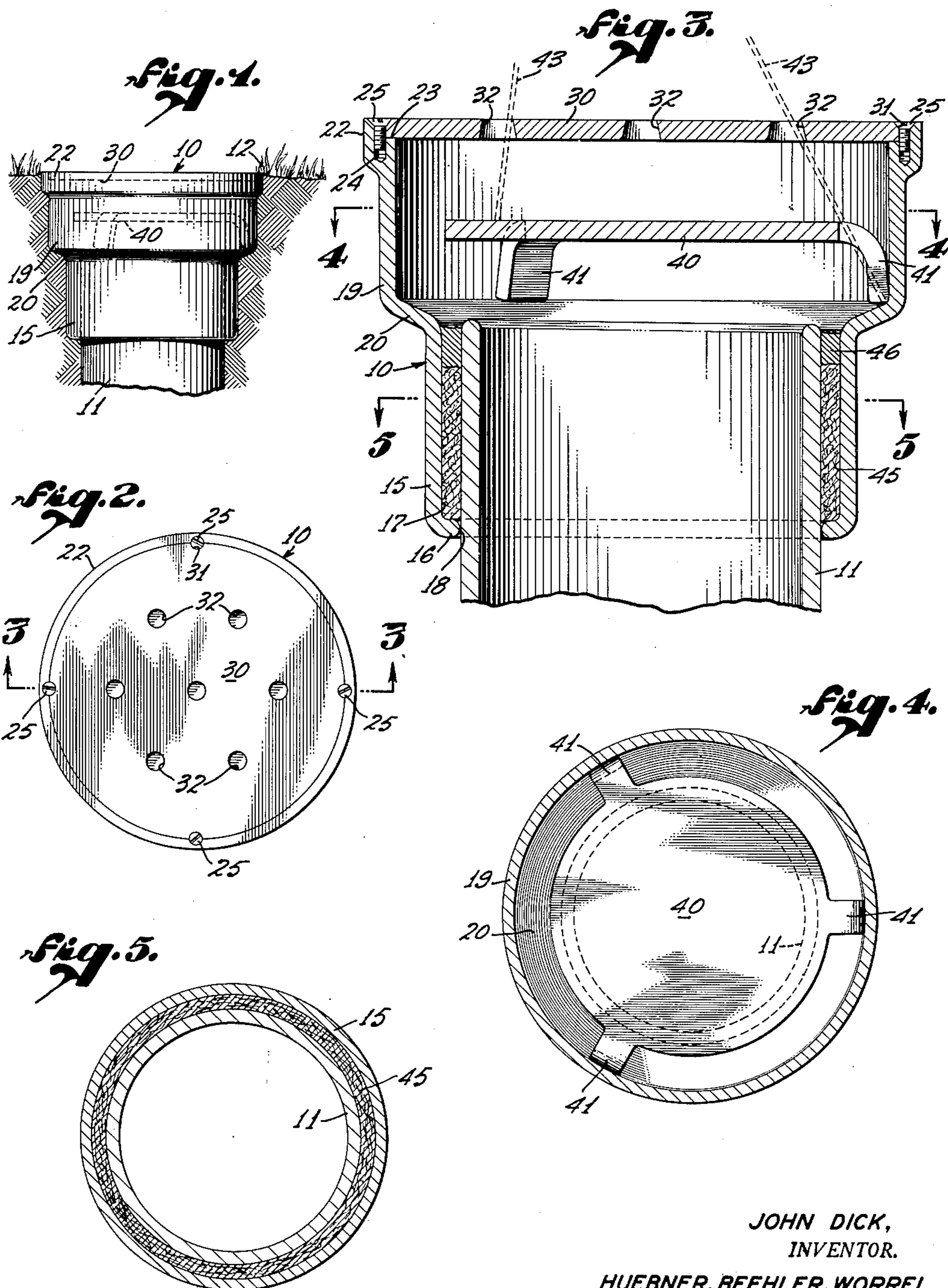
**Feb. 24, 1953**

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**2,629,456**

VENT CAP

Filed May 28, 1949



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## UNITED STATES PATENT OFFICE

2,629,456

## VENT CAP

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Application May 28, 1949, Serial No. 96,013

3 Claims. (Cl. 182—31)

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My invention relates to vent caps and is particularly applicable to vent caps for enclosing the upper end of soil pipe risers in domestic sewage systems.

In sewers and drainage systems it is the conventional practice to provide a trap near the connection of each individual service to the main sewer or drainage line and to provide a vent adjacent to the trap for venting sewage gases, preventing vapor locks, and obviating siphoning of the trap. The vent normally takes the form of soil pipe extended upwardly to the surface, or slightly above the surface, of the soil. For effective operation, it is essential that the upper end of the soil pipe be at all times in communication with the atmosphere and that the collection of debris in the pipe be precluded.

The conventional practice employs dome-like caps inverted over the upper ends of such vent pipes. Such caps are readily displaced permitting debris to collect in the vent and/or to descend into the sewer through the vent to clog the same. Further, in order to have a venting effect, such caps must be elevated above the surface level of surrounding soil. This is normally accomplished by extending the vent pipe upwardly from the soil where the cap and the pipe are readily broken, the cap frequently displaced, and the pipe and cap at all times conspicuous.

An object of the present invention is to provide an improved vent cap.

Another object is to provide a vent cap for the upper end of a vent pipe which is securely fastened thereto, at all times is pervious to the passage of gases therethrough, and effectively precludes the entry of debris of sufficient size to clog the vent pipe or sewer or drainage line to which it is connected.

Another object is to provide a vent cap which effectively performs its aforesaid functions when arranged flush with surrounding earth surfaces.

Another object is to provide an inconspicuous vent cap permitting the venting of sewer and drain lines through lawns, sidewalks, roadways, and the like without objectionable appearance.

Another object is to provide a vent cap adapted to be mounted by calking operations, which calking is readily accomplished conveniently from the top thereof with the cap in operable position.

Another object is to provide an improved vent cap that is economical to produce, easy to install, and effective in its operation.

Further objects and advantages will become apparent in the subsequent description in the specification.

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In the drawings:

Fig. 1 is a side elevation of a vent cap embodying the principles of my invention secured to the upper end of a vent or riser pipe.

Fig. 2 is a top plan view of a vent cap showing the principles of my invention.

Fig. 3 is a sectional elevation of my vent cap.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 3.

The vent caps made in accordance with the principles of my invention find their most advantageous use when positioned on the upper end of riser pipes and disposed flush with a lawn, sidewalk, or other surface. Fig. 1 illustrates such an installation and comprises a vent cap, designated generally at 10, secured to the upper end of a riser pipe 11, such as soil pipe, and being positioned flush with the upper surface of a lawn 12.

Further details are illustrated in Fig. 3, which shows the riser pipe 11 in section and illustrates the vent cap as comprising a lower cylindrical portion 15 having an inturned flange 16 at the lower end thereof. The inner diameter of the cylindrical section 15 is substantially larger than the outer diameter of the riser pipe 11 over which it is positioned thereby defining an annular chamber 17.

The inturned lip 16 defines a circular aperture 18 of substantially the same diameter as the outer surface of the riser pipe 11. The vent cap is also formed with an upper cylindrical portion 19 of substantially larger diameter than the cylindrical portion 15, the two said sections being connected by a frusto-conical portion or shoulder 20.

The upper edge of the cylindrical portion 19 is formed with an enlarged rim 22 forming an external shoulder. A groove is undercut or otherwise formed in the rim 22 inwardly disposed to the portion 19 providing a ledge 23. A plurality of bores 24 are formed in the rim 22 and are threaded to receive screws 25. A flat disc-like plate 30 having dimensions co-extensive with the undercut groove of the rim 22 is nested in said groove on the ledge 23 and is formed with notches 31 spaced around the outer periphery thereof and complementary with the bores 24 so that the heads of the screws 25 hold the plate 30 securely in place.

The plate 30 is also formed with a plurality of perforations or apertures 32 adapted to permit the escape of sewer gases.

A second circular plate 40 having a diameter

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less than the inner diameter of the cylindrical member 19 and larger than the inner diameter of the riser pipe 11 is disposed in the cylindrical section 19 substantially parallel to the plate 30 and supported by a plurality of downwardly turned legs 41. The legs are preferably formed integrally with the plate 40 and turned downwardly and outwardly to rest on the shoulder 20 and to abut the cylindrical portion 19. Three legs are sufficient but more may be employed, if desired. The legs serve gravitationally to support the plate 40 in spaced relation to the cylindrical portion 19 and to the plate 30 and to center the plate 40 on the vent pipe 11. The outer periphery of the plate 40 and the inner surface of the cylindrical section 19 define an annular passage freely permitting the escape of sewer gases.

The apertures 32 are preferably arranged in the plate 30 within a circle defined by the outer limits of the plate 40, therewith defining tortuous paths for the escape of sewer gases, and so that debris, such as a twig 43, does not have a free passage through the apertures 32 into the soil or riser pipe 11.

Any suitable means for securing the vent cap 10 to the riser pipe 11 would be satisfactory, but I prefer the standard method employed by plumbers in connecting cast-iron pipe, namely, by packing oakum 45 into the annular chamber 17 and pouring lead 46 in molten state into the upper portion of said annular chamber 17 in the standard manner. Subsequently the lead is swedged tightly into place.

The few conventional vent caps which are adapted to be fixedly mounted in the manner just described involving calking operations, require that the vent cap and vent pipe be inverted to accomplish the calking. That is, they must be calked from what is their lower end when in operable position. It is of course extremely difficult to mount such vent caps on vent pipes that are already installed. This difficulty is obviated in the device of the present invention. To mount the instant vent cap on an erect vent pipe, the screws 25 are removed, the plate 30 laid aside, and the plate 40 lifted from its nested position on the shoulder 20. In such condition the vent cap is slidably positioned over the vent pipe, the oakum 45 rammed into place, the lead 46 readily poured in the funnel-shaped cap, and the lead conveniently swedged tightly into place through the ready access permitted by the open upper end of the cap. Subsequently, the plate 40 is rested on the shoulder 20 and the plate 30 returned to position and secured by means of the screws 25.

So mounted, the cap of the present invention is inconspicuously imbedded in a lawn, sidewalk, or other desired area. Being imbedded, it is protected against damage to which conventional vent caps extended upwardly above the soil are subject. The sewer to which the vent pipe 11 is connected is effectively vented to the atmosphere. Dust and small quantities of sand and the like may sift through the plate 30, downwardly into the vent pipe, and subsequently be washed away by the sewer. All bulky debris of all kinds which might clog the vent and/or sewer is effectively kept therefrom by the novel structure and association of the plates 30 and 40 within the cylindrical portion 19 of the vent cap.

The vent cap of the present invention is economical to produce. The cylindrical portions 15 and 19 are conveniently and easily cast in unitary relation. The plate 40 is adapted for economical

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casting and/or fabrication production, as by stamping operations. The plate 30 is readily formed of similar stamping operations.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A vent cap assembly adapted to fit over the end of a riser pipe in a sewer system comprising a generally inverted bell-shaped housing having a downwardly extended cylindrical end of substantially larger diameter than the riser pipe and being formed with an inwardly turned flange at the lower edge thereof thereby defining an annular chamber between said riser pipe and said cylindrical portion adapted to receive packing for securing said vent cap to said riser pipe, said bell-shaped housing having a generally cylindrical upper section of substantially larger diameter than said lower cylindrical section, a substantially frusto-conical section interconnecting said upper and lower cylindrical portions, said upper cylindrical portion being formed with an enlarged shoulder about the upper periphery thereof, said shoulder being formed with an inner peripheral groove, a foraminous plate nested within said peripheral groove, and an imperforate plate disposed in spaced relation between said foraminous plate and the upper end of said riser pipe and adapted to underlie each of the perforations through said foraminous plate, said imperforate plate being of substantially smaller diameter than the inner diameter of the encircling cylindrical portion thereby defining an annular passage between said imperforate plate and said upper cylindrical portion, and being formed with a plurality of downwardly extended legs adapted to support said plate in said spaced relation on the frusto-conical portion of the housing.

2. A vent cap assembly adapted to fit over the end of a riser pipe in a sewer system comprising a generally inverted bell shaped housing having a downwardly extended cylindrical end of substantially larger diameter than the riser pipe and being formed with an inwardly turned flange at the lower edge thereof thereby defining an annular chamber between said cylindrical end and said riser pipe adapted to receive packing for securing said cap to said riser pipe, said bell shaped housing having a cylindrical upper portion of substantially greater diameter than said lower cylindrical portion, said upper and lower portions being connected in coaxial relation by a frusto-conical section integral therewith, a plate fitted in closing relation to the upper end of the upper portion of the housing having perforations formed therein within a circle concentric to the housing of a diameter less than the diameter of the lower portion thereof, and an imperforate plate of a diameter greater than the diameter of the lower portion of the housing and less than the diameter of the upper portion of the housing supported in substantially parallel relation to the perforate plate concentrically of the housing intermediate the frusto-conical section and the perforate plate by a plurality of down-turned legs integral therewith rested on the frusto-conical section.

3. A vent cap assembly comprising a housing

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having a cylindrical lower portion, a coaxially related cylindrical upper portion, and a frusto-conical section integrally interconnecting said upper and lower portions; an imperforate plate of a diameter approximating the inner diameter of the lower cylindrical portion of the housing having a plurality of down-turned legs extended outwardly therefrom and rested upon the frusto-conical section of the housing and against the walls of the upper portion of the housing locating the plate concentrically of said upper portion of the housing; and a plate mounted transversely on the upper portion of the housing in covering relation thereto, said plate having a plurality of openings formed therein in a pattern concentrically of the housing and of an overall diameter less than the diameter of the plate rested on the frusto-conical section of the housing.

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