Jan. 17, 1950 F. W. WARD, JR 2,494,679

VENT CAP

Filed Dec. 13, 1948

Fig. 1

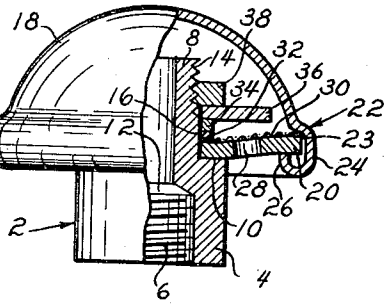



Fig. 2

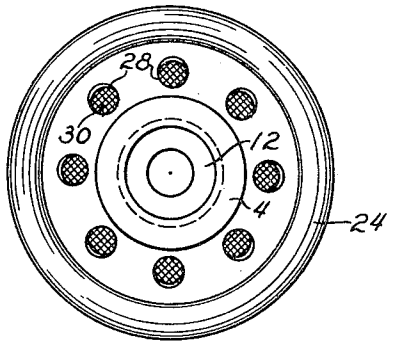



Fig. 3

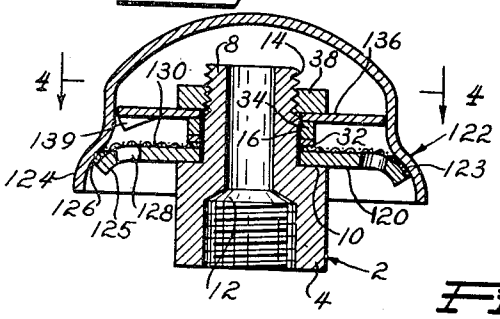



Fig. 4

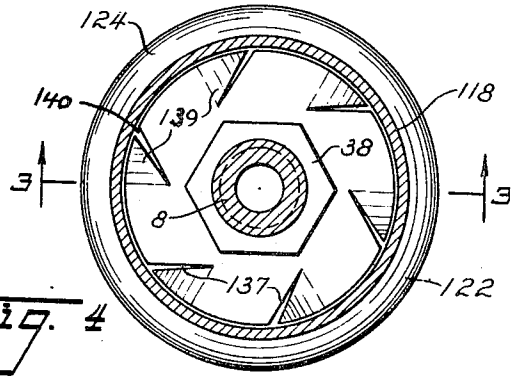



Fig. 5

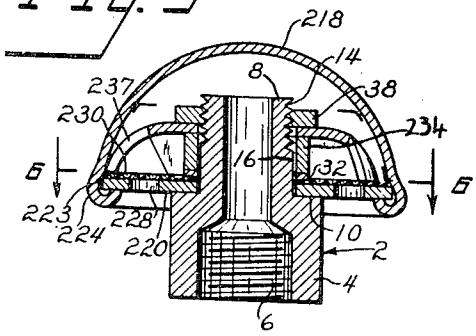



Fig. 6

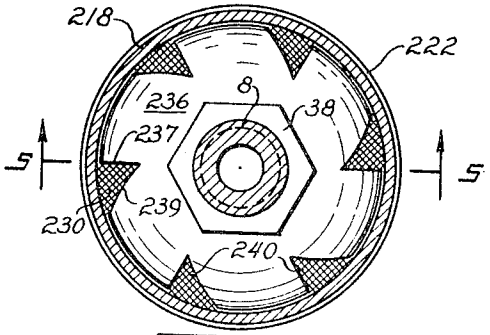
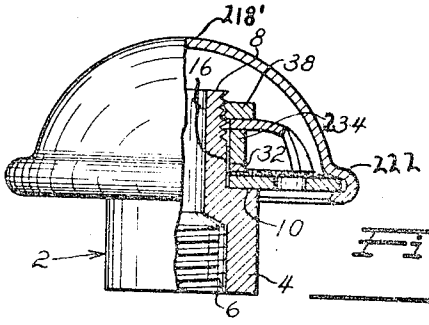



Fig. 7




INVENTOR

FRANK W. WARD, JR.

James H. Littlepage

ATTORNEY

Patented Jan. 17, 1950

2,494,679

# UNITED STATES PATENT OFFICE

2,494,679

## VENT CAP

Frank W. Ward, Jr., Memphis, Tenn.

Application December 13, 1948, Serial No. 64,947

1 Claim. (Cl. 220—44)

1

This invention relates to ventilating devices and, more particularly, to an insect-proof, ice- and weather-proof, fire- and explosion-resistant breather cap.

The invention is particularly, though not exclusively, applicable to pressure regulating apparatus for domestic gas systems wherein, customarily, a vent or stand pipe extends outdoors for connecting one side of a diaphragm chamber to the atmosphere. Prior devices, wherein the vent pipes terminate in a neck with a screen soldered across the downwardly-facing open mouth are notoriously vulnerable to freezing rain. Festoons of ice form around the lips with affinity towards the center because of the inhaling respiratory action of the breather, until the mouth is closed. Accordingly, it is intended to provide a dome-shaped cap having a certain flare so that ice will form away from the opening. Enshrouding the opening with a deep, flared skirt entices insects and, particularly, wasps which nest in the darkened, cavernous opening. Thus another object is so to arrange the screen with respect to the lip of the breather opening as to eliminate hospitality to nesting creatures.

Still another object is to provide a breather cap having a screened opening shielded by a perforate plate which not only supports the dome-shaped cap, but which renders the screen substantially impervious to the stick-probings of small boys.

Furthermore, it is intended to provide a baffle system not only to trap out fire, as from burning grass, but also to exclude water and to enforce drainage of moisture, as from condensation, from within the assembly. In this connection, the invention is applicable as a safety fire, and clog-proof vent for all sorts of receptacles containing inflammable fluids.

While accomplishing the above objectives, it is now proposed to provide a breather cap comprising a few simple elements capable of the most economic manufacture and assembly and applicable to the stand-pipes of existing vent systems. These and other objects will be apparent from the following specifications and drawings, in which:

Fig. 1 is an elevation, partially broken away, of the preferred embodiment of the invention;

Fig. 2 is a bottom view of the embodiment shown in Fig. 1;

Fig. 3 is a vertical cross-section, along the line 3—3 of Fig. 4 of a modified form of the invention;

2

Fig. 4 is a horizontal section along the line 4—4 of Fig. 3;

Fig. 5 is a vertical section through the center of a second modification;

Fig. 6 is a section along the line 6—6 of Fig. 5; and

Fig. 7 is an elevation, partially broken away, of the modification shown in Figs. 5 and 6, but showing an alternate cap form.

Referring now to the drawings in which like reference numerals denote similar elements, three embodiments are disclosed. The elements common to all embodiments comprise a hollow center post 2 having an enlarged lower portion 4 internally threaded at 6 for engagement with the upper end of stand or vent pipe in replacement of the neck commonly used. The center post has a reduced upper portion 8 joined on the outside to the lower portion by a right angular, upwardly facing shoulder 10 and on the inside by an inclined surface 12. Upper portion 8 has external threads 14 extending downwardly from the top and, preferably, a smooth exterior cylindrical surface 16 extending upwardly from shoulder 10.

Referring now to Figs. 1 and 2, the first embodiment includes a dome-shaped, hollow cap 18 which enshrouds the upper portion 8 of center post 2 supported in spaced relation to the center post by a perforate annular disk 20 which surrounds the smooth exterior 16 of the center post and rests on shoulder 10. Cap 18 is flared outwardly as detailed at 22 to provide on its inner surface a seat 23 which rests on the outer edge portion of disk 20. The outward flare of cap 18 also forms an enlarged edge 24 which directs dripping rain away from the underneath side of the assembly. The free edge 26 of cap 18 is bent under, as by a curling die, to clamp the outer edge of disk 20 against seat 23.

In Figs. 1 and 2 it will be noted particularly that the outer portion of disk 20 is dished upwardly to provide an upwardly inclined annular surface near the inner portion of which is an annular series of perforations 28 for venting the interior of cap 18 to the atmosphere. Moisture condensed within or otherwise entering the interior of the cap will be drained down the slope of disk 20 to and through perforations 28.

A disk-like screen 30 is disposed over the upper surface of disk 20, preferably with the outer edges of the screen clamped between the disk and seat 23 on the cap. Screen 30 excludes insects and also militates against entry of moisture and flame. The inner edges of screen 30

surrounding smooth portion 16 of center post 2 are held down by a washer 32 which, in turn, is pressed beneath a spacer ring 34 supporting an annular flat baffle 36 in spaced relationship above disk 20. Baffle 36 is held down by a nut 38 engaged on threads 14.

It should be noted that the outer edge of baffle 36 is spaced from the inner side of cap 18 and, further, that disk 36 overlies and masks perforations 28, thus detering entry of moisture to the interior of the cap while also constituting a further element of the trap against fire from the exterior. It also limits distortion of screen 30 by inward probings through perforations 28.

In the embodiment illustration in Figs. 3 and 4, reference numerals denoting elements analogous to those previously described are distinguished by the prefix 1. Cap 118 which corresponds to cap 18 has substantially straight sides terminating in an outwardly flared portion 122 providing an inner seat 123 but instead of a curled lower edge, thus a skirt-like free lower edge 124 which forms a pouring lip for rain shed by the cap. Disk 120 is dished downwardly to form a downwardly and outwardly inclined annular outer edge portion 125 spot welded, brazed, soldered, or similarly secured as indicated at 126 to cap 118. Preferably the outer edges of screen 130 are engaged between the disk and cap and incorporated in the weld or braze.

In the Fig. 3, Fig. 4 embodiment, baffle 136 is a generally flat annular member whose outer edges extend substantially to the inner straight sides of cap 118. Skewed slits 137 extend inwardly from the outer edges of disk 136 and the material on one side of each slit 137 is bent downwardly as shown at 139 to provide vertical passages 140 which not only insure drainage of moisture collecting within cap 118 but also constitute, together with disk 120 and screen 130, a fire trap.

The reference numerals denote elements in the embodiment shown in Figs. 5 and 6 analogous to those previously discussed or designated with the prefix 2. Cap 218 is similar to cap 18 but disk 220 is flat. Another distinguishing feature of this modification is the dome-shaped baffle 236 supported by spacer 234 and held down by nut 38 so that the lower edges of the baffle press against screen 230. Slits 237 extending inwardly from the outer edges of baffle 236 are each defined on one side by bent end portions 239 which define air passages 240 each resembling a portion of a spiral. The modification shown in Fig. 7 is similar to the Figs. 5 and 6 embodiment except that cap 218' is somewhat flattened and flared at 222 for holding down the screen.

In all embodiments, fire or water is deterred by the arrangement of the baffles, screens, and perforations in the disks which support the caps. In each instance, drainage of moisture from within the assembly is assured and in all cases rain or snow running down the exterior of the caps is detoured away from the breather openings.

If ice does form on the lower edges of the caps, it will hang well away from the perforations in the plates so that sealing thereof is virtually impossible. In no instance is there a dark cavernous lodging for bees, insects or the like, and the assemblies are structurally rugged.



The invention is not limited to the specific construction of the elements detailed above, but is attempted to cover all modifications and substitutes within the scope of the following claim.

I claim:

A breather cap comprising a hollow center post having a lower portion of relatively large external diameter, an upper portion of relatively smaller external diameter, an upwardly facing seat connecting the upper end of said lower portion and the lower end of said upper portion, a set of threads on the exterior of the upper portion extending downwardly from the top end thereof, a substantially annular disk having a central opening surrounding the lower end of said upper portion, said disk having a radially inward substantially flat portion substantially co-extensive with and engaged against said seat and a radially outward substantially dish-shaped portion extending upwardly therefrom, said dish-shaped portion having an annular series of openings through the lower portion thereof, an annular screen substantially co-extensive with the upper surface of said disk and engaged flat-wise thereagainst so as to screen said openings, an annular spacer of substantially less external diameter than the flat portion of said disk engaged on the upper portion of said post and seated on top of the screen, an annular, substantially flat baffle engaged on the upper portion of said post and resting on said spacer, a nut engaged on the threads on the upper portion of said post whereby to clamp together said disk, screen, spacer, and baffle between said nut and said seat, a cap having an upper regularly curved concave-convex substantially dome-shaped portion enshrouding the upper portion of said post and the said baffle with its inner wall in spaced-relationship therewith, and a lower, outwardly-flared skirt portion having its inner wall seated on the outer rim of said screen so as to engage the same tightly against said disk, the free edge of said skirt portion being reversely curved inwardly and upwardly and engaged around and upwardly against the outer portion of said disk whereby to hold said dome on said disk and to form a drainage lip.

FRANK W. WARD, JR.


REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 834,937 | Robinson | Nov. 6, 1906 |
| 1,219,000 | High | Mar. 13, 1917 |
| 1,320,543 | Gill | Nov. 4, 1919 |
| 1,502,944 | Earhart | July 24, 1924 |
| 1,784,067 | Holston | Dec. 9, 1930 |
| 1,887,119 | Cornell, Jr. | Nov. 8, 1932 |
| 1,920,261 | Lavender | Aug. 1, 1933 |
| 2,240,851 | Lowther | May 6, 1941 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 188,098 | Switzerland | Mar. 1, 1937 |