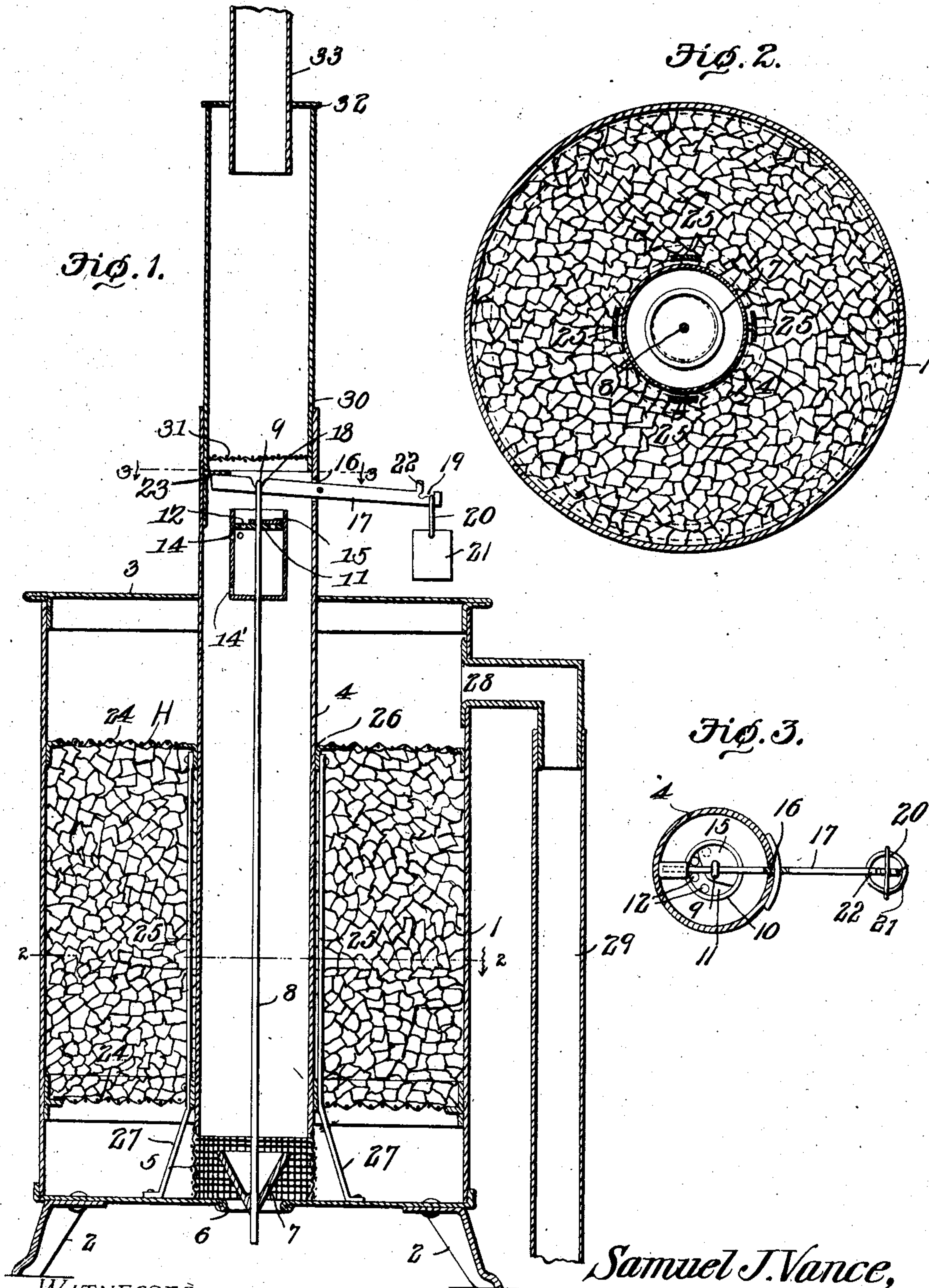


No. 834,776.

PATENTED OCT. 30, 1906.

S. J. VANCE.  
FILTER.

APPLICATION FILED MAR. 16, 1906.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

SAMUEL J. VANCE, OF CARTHAGE, MISSOURI.

## FILTER.

No. 834,776.

Specification of Letters Patent.

Patented Oct. 30, 1906.

Application filed March 16, 1906. Serial No. 306,447.

*To all whom it may concern:*

Be it known that I, SAMUEL J. VANCE, a citizen of the United States, residing at Carthage, in the county of Jasper and State of Missouri, have invented a new and useful Filter, of which the following is a specification.

This invention relates to filtering devices for removing the impurities from water passing from the roofs of buildings into cisterns; and the invention has for its object to simplify and improve the construction and operation of this class of devices.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications within the scope of the invention may be resorted to when desired.

In the drawings, Figure 1 is a vertical sectional view of a filter constructed in accordance with the principles of the invention. Fig. 2 is a horizontal sectional view taken on the plane indicated by the line 2 2 in Fig. 1. Fig. 3 is a horizontal sectional view taken on the plane indicated by the line 3 3 in Fig. 1.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

The body of the improved filter consists of a tank or vessel 1 of suitable shape and dimensions, said tank being preferably provided with legs or supporting members 2 2, whereby it will be suitably elevated above the surface of the ground.

The tank 1 is preferably fitted with a removable lid or cover 3, through which extends a pipe 4, which has been shown as extending nearly to the bottom of the tank, the lower end of said pipe being connected with an annular strainer 5, the lower edge of which rests upon the bottom of the tank. The latter is provided with an escape-opening 6, which is surrounded by the annular strainer 5 and which forms a seat for a valve 7, carried by a rod 8, which latter extends upwardly through the pipe 4, said rod being

provided at its upper end with a terminal suspending member, such as a hook 9. The rod 8 carries below its upper end a bucket member or casing 10, which is provided near its upper edge with a closure 11, said closure or lid being distinctly spaced from the upper edge of the casing, so that the side walls of the latter will constitute a flange surrounding said closure. In order that the bucket member or casing may be properly balanced upon the rod 8, the latter is preferably extended through the bottom and through the lid of said bucket member, the bottom and the lid being soldered upon or otherwise suitably connected with the rod. The lid of the bucket is provided with a plurality of apertures 12, preferably disposed in series around the rod and concentric with the axis of the latter. The bucket member is also provided in its side walls just beneath the lid with one or more vent-openings 14, and a drain-opening 14' is formed in or near the bottom of the bucket member.

A valve 15, which has been shown as pivotally engaging the rod 8, is supported upon the lid of the bucket member in a position to enable it to constitute a closure for one or more of the apertures 12, a plurality of said apertures being usually left uncovered.

The vertically-disposed pipe 4 has a side opening or slot 16, through which extends a suitably-supported lever 17, provided near its inner end with a notch 18, engaged by the hook or supporting member 9 of the rod 8. The lever 17 is provided near its outer end with a notch 19, in which may be fitted the supporting-bail 20 of a weight member 21. Upon the lever adjacent to the inner edge of the notch 19 is formed an upwardly-projecting nib 22, between which and the fulcrum of the lever the weight-carrying bail 20 will be adjusted under certain circumstances to be hereinafter described. A suitable stop member 23 is disposed in the path of the inner end of the lever to limit the upward movement of the latter.

Fitted within the tank 1 and surrounding the pipe 4 is a holder H for charcoal or other suitable filtering or purifying material, said holder consisting in its simplest form simply of a pair of foraminous diaphragms 24, connected and spaced apart by rods or connecting members 25 and having central apertures 26, whereby they are fitted upon the pipe 4. The connecting members may be extended downwardly to form legs or supporting mem-



bers 27, whereby the charcoal-holder will be supported above the bottom of the tank. The upper diaphragm 24 is disposed some distance beneath the lid of the tank, and the side wall of the latter is provided between said lid and diaphragm with an exit-opening 28, with which is connected a pipe or conduit 29, leading to the cistern.

Fitted slidably in the upper end of the pipe 4 is a strainer 30, consisting of a pipe-section having a foraminous bottom diaphragm 31. The strainer-pipe 30 is provided at its upper edge with a flange or collar 32, which may be of rubber or other suitable flexible material and which slidably engages the rain-spout 33, upon which it will be retained by frictional contact.

In the operation of this device water coming through the pipe 33 will be strained through the foraminous diaphragm 31 of the pipe 30, and leaves, twigs, and other coarse impurities will thus be removed, such impurities being afterward removed from the strainer by detaching the latter and inverting it, as will be readily understood. Normally the rod 8, with the valve 7 and the bucket member 10, which is suspended at one side of the fulcrum of the lever 17, will be overbalanced by the weight member 21, which is suspended at the other side of the fulcrum of said lever. As water enters the filter-casing a portion thereof will run to waste through the aperture 6, above which the valve 7 is suspended. A portion of the water will pass into the bucket member or casing 10 through the apertures 12, which in the aggregate present a larger area than the drain-opening 14', through which a fine stream of water will constantly escape. Air displaced by the water entering the bucket member 10 may escape through the apertures 14. After a time the weight of the water accumulating in the bucket member 10 will overbalance the weight member 21, and the lever 17 will thus be tilted with the effect of seating the valve 7, thus obstructing the outlet 6. The water will now rise within the tank 1 and pass upward through the filtering or purifying material in the holder H, the purified water passing through the conduit 29 to the cistern.

When water ceases to flow from the pipe 33, the bucket member 10 will be gradually drained, its contents passing through the aperture 14', and the lever 17 will thus be restored to its initial position by the weight member 21, thus unseating the valve 7 and permitting the water contained in the tank or casing to flush out rapidly through the aperture 6, carrying with it the greater portion of sediment and coarse impurities. In showery weather it may not be desirable to permit the contents of the casing to escape immediately upon the cessation of the rain. The weight member 21 will then be adjusted with its supporting-bail 20 adjacent to the

nib 22, and when the lever 17 is first tilted the weight member will then be free to slide in the direction of the fulcrum of the lever until arrested by contact with the pipe 4. The weight of the several parts will be so regulated that when the weight member is in this position it will be overbalanced by the rod 8 and the parts connected with the latter, and the lever 17 having once been tilted to effect the seating of the valve 7 it will remain in this position until manually reset.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. The construction of the improved filter is simple and inexpensive. It is easily installed, and it has proven to be thoroughly efficient for the purposes for which it has been devised.

It will be understood that by manipulating the valve 15 a greater or a less number of the inlet-apertures 12 may be left unobstructed for the admission of water into the bucket member 10 and that consequently the period consumed in the admission of water into the bucket member to an extent sufficient to cause the weight member 21 to be overbalanced may be timed with some degree of accuracy. A greater or a less quantity of water may thus be permitted to run to waste before the flow of the water is diverted to the cistern. By obstructing all of the inlet-apertures operation of the valve-closing mechanism will be prevented and the water will be permitted to run to waste.

Having thus described the invention, what is claimed is—

1. In a filter, a tank having an exit-opening in the bottom thereof, a pipe extending into said tank and terminating above the bottom, an annular strainer connected with the pipe resting upon the bottom of the tank and surrounding the exit-opening, means for conducting rain-water into the upper end of the pipe, a lever, a rod suspended from said lever, a valve carried by said rod and forming a closure for the exit-opening in the bottom of the tank, a bucket member or casing supported by the rod in the path of the incoming water and having water-inlets and a drain-opening, a counterweight supported by the lever, a water-conduit connected with the tank near the upper end thereof, and a holder for filtering material seated in the tank surrounding the pipe in the latter above the bottom of the tank and beneath the exit-conduit connected therewith.

2. In a filter of the class described, a lever-supported valve-carrying rod disposed in the path of incoming water and a bucket member upon said rod; said bucket member having a lid spaced from the upper edge thereof and provided with inlet-apertures, air-vents in the side wall of said member below the lid,



and a drain-opening near the bottom; and a valve member adapted to constitute a closure for one or more of the inlet-openings.

3. In a filter of the class described, a lever-  
5 supported valve-carrying rod disposed in the path of incoming water, and a bucket member upon said rod; said bucket member having a lid provided with inlet-apertures arranged in series approximately concentric  
10 with the axis of the rod which latter extends through the lid of the bucket; and a valve member pivoted upon the rod and adapted to constitute a closure for the inlet-apertures.

4. In a filter of the class described, a tank  
15 having a central outlet-opening in the bottom thereof, an inlet-pipe arranged concentrically within the tank and over the outlet, a strainer removably supported on the upper end of the inlet-pipe, an annular strainer attached to the discharge end of the pipe and  
20 the bottom of the tank, a valve for controlling the outlet-opening, and a mechanism for actuating the valve which is supported by the said pipe between the strainers and

arranged partly within and partly without 25  
the pipe.

5. In a filter of the class described, a tank, an inlet-tube extending into the tank and discharging adjacent the bottom thereof, means for conveying the filtered water away 30  
from the tank at the upper end thereof, a body of filtering material arranged between the discharge end of said pipe and the said means, and a device supporting the said material in the tank, said device comprising a 35  
foraminous diaphragm at the top and bottom of said material, and rods for securing the diaphragms together and forming legs for supporting the same upon the bottom of  
40 the tank.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SAMUEL J. VANCE.

Witnesses:

W. H. ALEXANDER,

W. S. CRANE.