Oct. 25, 1949. J. B. BLAU 2,485,547

ANTICLOGGING DEVICE FOR ROOF DRAINS

Filed June 14, 1947 2 Sheets-Sheet 1

Fig. 1

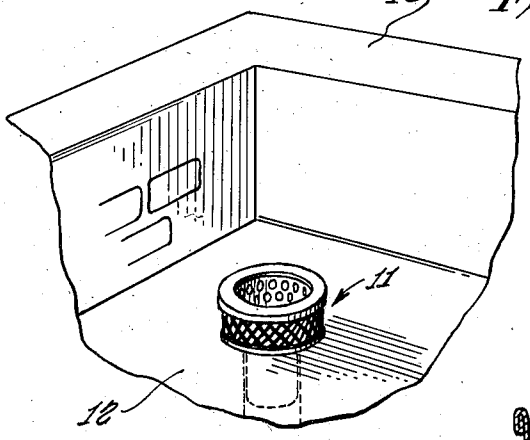
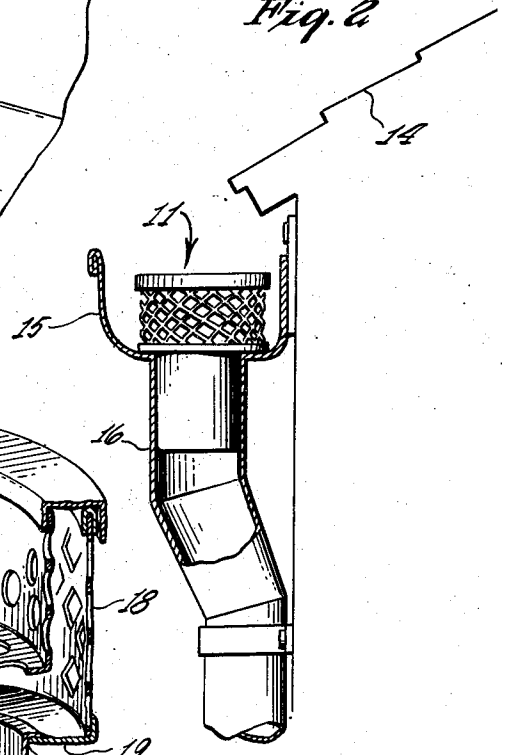



Fig. 2



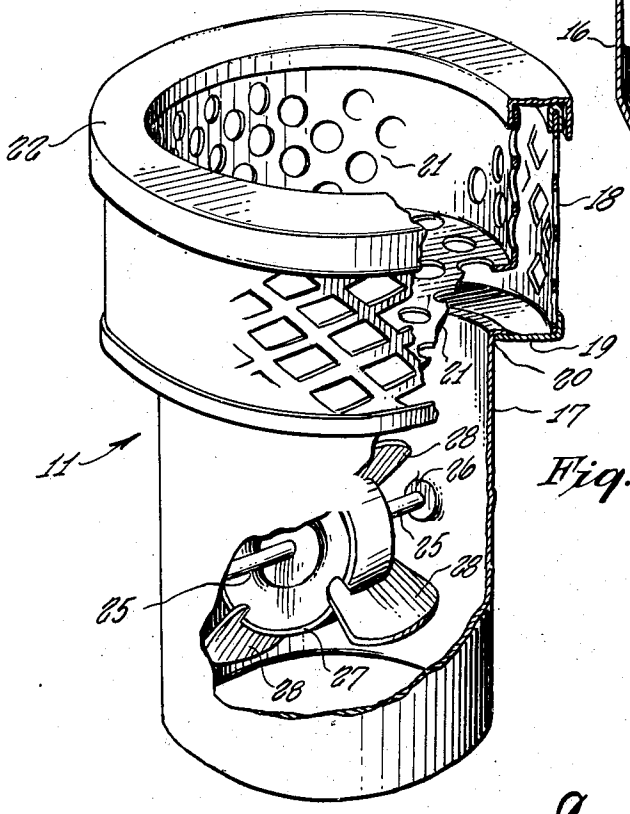




Fig. 3

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ANTICLOGGING DEVICE FOR ROOF DRAINS

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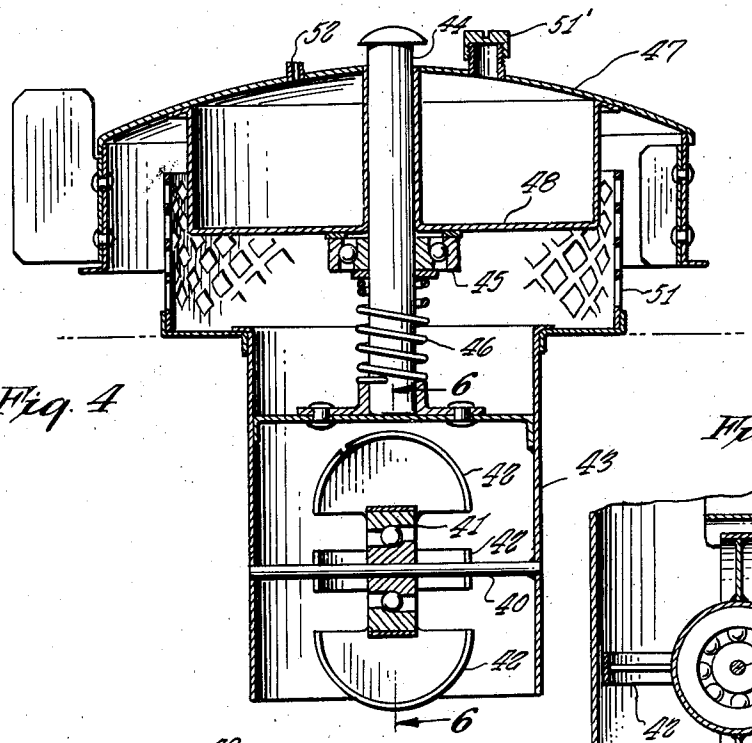


Fig. 4

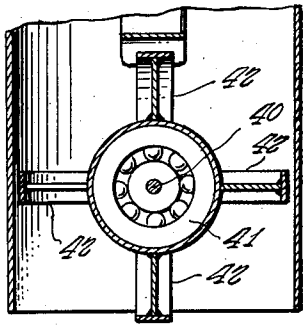


Fig. 6

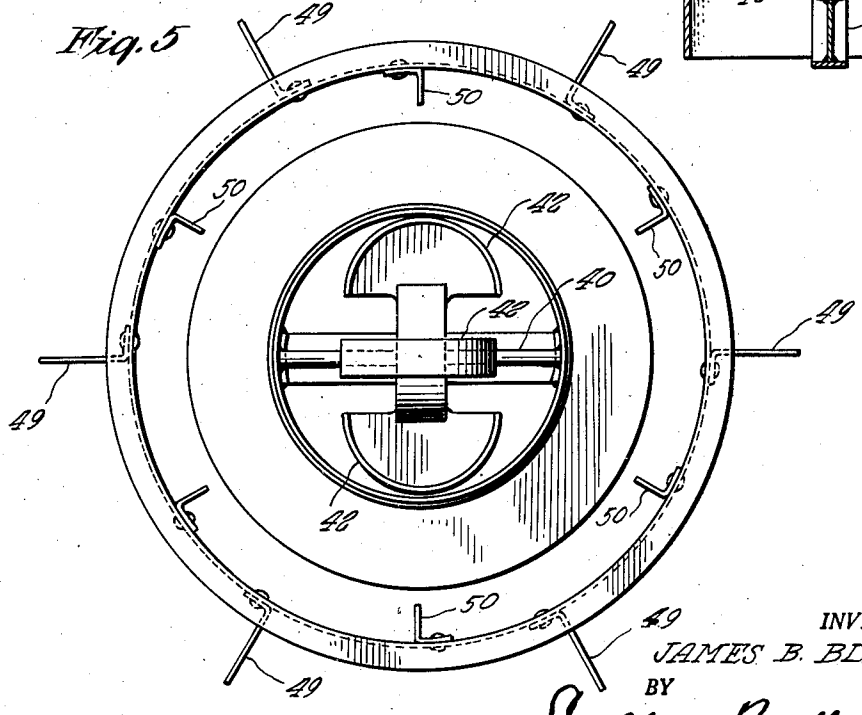


Fig. 5

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# UNITED STATES PATENT OFFICE

2,485,547

## ANTICLOGGING DEVICE FOR ROOF DRAINS

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5 Claims. (Cl. 210—170)

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The present invention relates to anti-clogging devices for roof drains and more particularly to devices of this type which provide one or more turbine elements which are operated by water entering the drain.

It is an object of the invention to provide a device which will break the suction created in the drain or leader pipe from a roof or gutter when the water flow becomes increased to a point where there is a tendency to draw paper and other materials forcibly toward the strainer and thus clog the openings therein.

It is a further object of the invention to provide a device having a rotary member disposed to protect the strainer in dry weather and to revolve when water enters the drain. The rotary member includes external projections which will clear away debris which floats toward the drain while the rotary member is revolving.

A further object is to provide a float in the rotary protective member which will raise the member sufficiently to permit the entry of water under the edge thereof. The invention contemplates means for venting the float, allowing it to accommodate changes in pressure which would otherwise result from changes in temperature and for filling the float with a light liquid such as alcohol which has a low freezing point. The purpose of the low freezing point liquid is to prevent water which might otherwise enter the float from freezing during cold weather thereby distorting or otherwise damaging the float.

The invention finds particular usefulness during the fall when leaves gather in and around roof drains and gutters.

Other and further objects will become apparent upon reading the following specification together with the accompanying drawing forming a part hereof.

Referring to the drawing,

Fig. 1 shows a perspective view of an embodiment of the invention in position on a roof.

Fig. 2 is a sectional view in elevation showing the invention positioned in a leader which is connected to a gutter.

Fig. 3 is a perspective view of the embodiment of Fig. 1, partly broken away to show the turbine mechanism.

Fig. 4 is a sectional view in elevation of a modified form of the invention.

Fig. 5 is a bottom view of the modified form shown in Fig. 4.

Fig. 6 is a fragmentary sectional view taken along the line 6—6 of Fig. 4 looking in the direction of the arrows.

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Referring to Fig. 1, the device indicated generally as 11 is shown in the corner of a flat roof 12 which is enclosed by a parapet 13. The device 11 is located in the drain pipe situated at the lowest portion of the roof which slopes slightly toward the drain.

In Fig. 2, the inclined roof 14 drains into gutter 15 which connects with leader 16 in the usual manner. The device 11 is positioned in the upper end of leader 16 at the point where it joins gutter 15.

Referring to Fig. 3, device 11 comprises a hollow lower cylindrical portion 17 of suitable dimensions to fit removably within leader 16 of Fig. 2 or within the drain pipe connecting with roof 12 of Fig. 1. A cylindrical strainer member 18 of suitable perforated material is secured to the exterior of a flat ring 19 which is fastened at its internal periphery to the upper extremity of lower hollow cylindrical portion 17.

A cup shaped strainer 21 of suitable perforated material is secured to an annular member 22 which is flanged to fit loosely over the upper portion of strainer 18. Cup strainer 21 is readily removable in order that debris accumulated therein may be readily emptied therefrom.

Centrally disposed within the interior of hollow member 17 is a transversely extending shaft 25 suitably journalled at 26 in bearings of any desired type which minimize friction and which will withstand repeated immersion in water. Shaft 25 carries a turbine wheel 27 which is shown provided with a plurality of blades 28. The blades are shown straight but may be shaped, if desired, to provide for a tendency to favor a particular direction of rotation.

Water from the roof having passed through the strainers enters lower cylindrical portion 17 at one side or the other. The unit is positioned within leader 16 so that it tilts slightly and so that water entering the unit initially will act on the blades 28 to cause rotation of wheel 27 in a particular direction. As the flow increases to a point where water tends to fill the entire pipe and create a suction at the strainer, the rotation of wheel 27 and blades 28 carried thereby creates a turbulence in the water and prevents the water column in leader 16 from filling the pipe and creating such a suction at the upper end thereof. The creation of such a suction causes water to be drawn with unusual velocity toward the strainer and moreover it draws forcibly against the strainer any debris which may be floating therein, thus clogging the openings in the strainer

and causing the external water level to rise unduly.

Referring to Fig. 4, a modification of the invention is illustrated. A transverse shaft 40 is shown supporting a ball bearing 41 which carries at its periphery a plurality of bucket shaped turbine blades 42. The bucket shape shown may be modified to cause rotation in a particular direction as noted above. The shaft 40 is disposed in hollow cylindrical portion 43 which is to be fitted into leader 16 in a manner similar to that described for Figs. 1 to 3. This is described above with respect to cylindrical portion 17 of the embodiment of the invention illustrated in Fig. 3.

A vertical stationary shaft 44 carries a ball bearing 45 which slides freely thereon and which is supported by coil spring 46. A rotor 47 is freely mounted on shaft 44 and comprises a bottom portion which is closed to provide a float and which rests on bearing 45 so that rotor 47 will revolve with the greatest freedom.

Rotor 47 is provided with a plurality of external radially-extending blades 49 and with internally extending blades 50. Rotor 47 is set in motion by the whirlpool action of the water as it swirls through strainer 51 and into cylindrical portion 43 which is disposed in the drain leader. As debris approaches rotor 47 it is thrown outwardly by the action of external blades 49 which are kept in motion by the inertia of rotor 47.

Rotor 47 may be so arranged that it rests in a relatively low position providing a minimum space for the passage of water beneath its peripheral edges. As the flow of water increases, the float action of closed bottom portion 48 combined with the action of coil spring 46 causes the rotor to rise to accommodate the increased flow and at the same time the periphery may remain slightly submerged thus preventing floating debris from coming in contact with strainer 51, this floating debris being urged outwardly and away from rotor 47 by the action of the blades 49. Blades 50 serve to respond to the swirling action of the water and aid in maintaining the rotor 47 in motion.

Provision is made by removable cap 51' for filling the float formed by bottom 48 with a fluid such as alcohol to prevent freezing during cold weather. The float is vented at 52 to permit it to breathe during changes in temperature or in atmospheric pressure. This breathing is desirable to prevent changes in temperature from creating mechanical stresses in the rotor and particularly to permit water to evaporate if it should become trapped within the unit. Freezing of such trapped water would damage the rotor. The venting action permits water to enter the rotor and thus makes it desirable to provide an anti-freezing liquid of low specific gravity within the float in order that the freezing point of the mixture may be kept sufficiently low to prevent damage to the structure. In addition, the buoyancy of the float may be adjusted by suitable selection of the anti-freezing liquid.

I have shown to be what I believe to be the best embodiments of my invention. I do not wish, however, to be limited by the embodiments shown but as by the invention as set forth in the appended claims.

I claim:

1. An anti-clogging device for roof drains comprising a hollow lower cylindrical portion adapted to be fitted into the upper end of a leader pipe of a drain, a flat ring fastened to the upper end of the cylindrical portion and adapted to rest upon



the end of the leader pipe, a cylindrical strainer threaded onto the flat ring and extending thereabove and above the upper end of the leader, a shaft extending transversely across the cylindrical portion and a turbine wheel mounted on said shaft and having blades adapted to be contacted by water entering the device and to set up a turbulence of such water whereby to keep debris from entering the cylindrical strainer from the exterior side thereof.

2. An anti-clogging device for roof drains comprising a hollow lower cylindrical portion adapted to be fitted into the upper end of a leader pipe of a drain, a flat ring fastened to the upper end of the cylindrical portion and adapted to rest upon the end of the leader pipe, a cylindrical strainer threaded onto the flat ring and extending thereabove and above the upper end of the leader, a shaft extending transversely across the cylindrical portion and a turbine wheel mounted on said shaft and having blades adapted to be contacted by water entering the device and to set up a turbulence of such water whereby to keep debris from entering the cylindrical strainer from the exterior side thereof, a cup-shaped strainer having a bottom and a side wall adapted to fit within the cylindrical strainer from the upper end thereof and an annular member secured to the cup-shaped strainer and having a depending flange adapted to fit over the upper end of the cylindrical strainer to hold the cup-shaped member concentrically spaced within the cylindrical strainer and against displacement therewithin, the bottom of said cup-shaped member being spaced from the upper end of the hollow cylindrical portion so as not to interfere with the upward turbulence of the water extended by the turbine wheel.

3. An anti-clogging device for roof drains comprising a hollow lower cylindrical portion adapted to be fitted into the upper end of a leader pipe of a drain, a flat ring fastened to the upper end of the cylindrical portion and adapted to rest upon the end of the leader pipe, a cylindrical strainer threaded onto the flat ring and extending thereabove and above the upper end of the leader, a shaft extending transversely across the cylindrical portion and a turbine wheel mounted on said shaft and having blades adapted to be contacted by water entering the device and to set up a turbulence of such water whereby to keep debris from entering the cylindrical strainer from the exterior side thereof, a transversely extending support within the cylindrical portion above the turbine wheel, a vertically extending shaft supported upon said transverse support and extending upwardly above the cylindrical strainer and centrally thereof, a rotor mounted on said shaft for free rotation and extending outwardly over the upper end of the cylindrical strainer and downwardly over the sides thereof, but spaced therefrom, radially outwardly extending and radially inwardly extending blades circumferentially spaced about the rotor whereby to give the rotor rotation as the whirlpool action of the water is effected upon entering the strainer and wherein debris upon approaching the rotor will be thrown outwardly by the action of the radially extending external blades.

4. An anti-clogging device as defined in claim 3 and said rotor having a bottom portion closed to provide a float, a spring support on the shaft and resting on the transverse support for supporting the rotor, said spring support including a ball bearing unit having one race connected to

the rotor bottom portion, said bottom portion being retained above the upper end of the hollow cylindrical portion.

5. An anti-clogging device as defined in claim 3, said rotor having a fluid inlet for the float through which liquid may be extended to control the buoyance of the rotor and a breathing nut on the rotor.

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