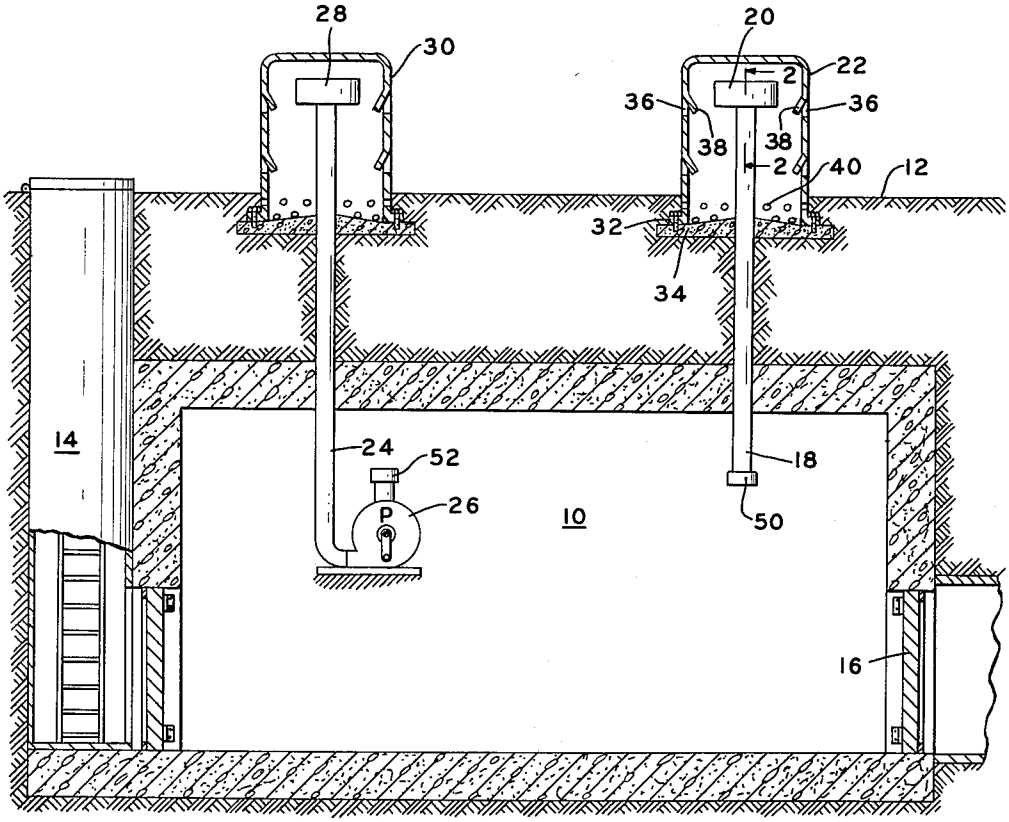
June 11, 1963 M. M. ROSENFELD 3,093,056

VENTILATION SYSTEM

Filed Aug. 22, 1961

FIG. 1



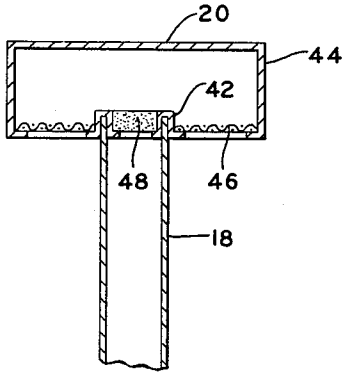


FIG. 2

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VENTILATION SYSTEM

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This invention relates to a ventilation system, and more particularly, to a ventilation system for underground enclosures such as bombshelters, basements in homes, subway systems, etc.

It has been conventional heretofore to provide a simple intake pipe and exhaust pipe for an underground enclosure with such pipes extending to a point above ground level. Such intake and exhaust pipes are generally provided with a hood or the like so as to prevent falling rain, air-borne dust, and the like from passing down through the pipes under the effect of gravity. As a general rule, the hood will be positioned at a point spaced from ground level.

Such conventional intake and exhaust pipes suffer from a number of disadvantages. Thus, no means has been provided to prevent tampering with the pipes and hood. Accordingly, mischievous persons have stuffed paper, leaves, dirt, etc. into the pipes or into the hood in a manner so as to clog a filter or the like. Also, the hoods are stolen so as to prevent the ventilation system from having the advantages of a hood.

The above mentioned disadvantages become more acute when the intake and exhaust pipes are a portion of the ventilating system for an underground enclosure such as a bombshelter. Under these circumstances, the failure of having a tamperproof ventilation system may be disastrous. The manner in which the intake and exhaust pipes extend above ground, as proposed heretofore, subject the above ground portion to damage due to falling buildings, trees and the like. Unless an adequate tamperproof device is provided for the intake and exhaust pipes on a ventilation system for a bombshelter, the defects in the ventilation system will generally not be discovered until it is too late to rectify the same.

It is an object of the present invention to provide a novel ventilation system for underground enclosures so that an intake and/or exhaust pipe disposed above ground level and communicating with such enclosure is provided with a tamperproof shield.

It is another object of the present invention to provide a novel tamperproof shield for an intake and/or exhaust pipe disposed above ground level.

It is another object of the present invention to provide a novel ventilation system for a bombshelter disposed underground.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a longitudinal sectional view of a bombshelter disposed completely underground.

FIGURE 2 is an enlarged transverse sectional view of the hood disposed on the upper end of the intake pipe.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 an underground bombshelter designated generally as **10**.

The bombshelter **10** may be of the type disposed completely below the ground level **12** and having walls formed of poured concrete or the like. Preferably, the bombshelter **10** is provided with an escape hatchway **14** communicating through an escape hatch positioned at ground level. Preferably, the bombshelter **10** is also provided

with a door **16** which communicates with a portion of an adjoining building, such as the basement of a private residence.

The bombshelter **10** is provided with an intake pipe **18** having its upper end disposed above the ground level **12**. The hood **20** is secured to the upper end of the pipe **18**. A tamperproof shield **22** surrounds the upper portion of the intake pipe **18**.

An exhaust pipe **24** is provided with one end in communication with the interior of the bombshelter **10** and the other end disposed above the ground level **12**. A manually operable crank-type centrifugal blower **26** is secured to the end of the pipe **24** disposed within the interior of the bombshelter **10**. A hood **28** is secured to the upper end of the pipe **24**. A tamperproof shield **30** surrounds the upper end of the pipe **24**.

The shields **22** and **30** are identical. Accordingly, it is deemed sufficient to only describe the shield **22** in detail. The shield **22** is a cup-shaped body having a radially outwardly extending flange **32** at the open end of the body. The cup-shaped body on the shield **22** is disposed so that it surrounds the hood **20** and the upper portion of the pipe **18** with the open end of the cup-shaped body being disposed intermediate the ends of the pipe **18** at a point below ground level **12**.

A foundation **34** of concrete or the like is provided around the pipe **18** below ground level as illustrated in FIGURE 1. Such foundation **34** may be performed and disposed around the pipe **18** at the desired location of the bombshelter or the like. It will be noted that the uppermost surface of the foundation **34** tapers in a direction away from the pipe **18**.

The flange **32** is bolted to the foundation **34** in any convenient manner. The portion of the cup-shaped body of the shield **22** between the foundation **34** and a point slightly above ground level **12** is provided with a plurality of holes **40** which permit water trapped within the shield **22** to readily escape.

The dome portion of the cup-shaped body of the shield **22** is imperforate. The body of the shield **22** is preferably cylindrical in transverse cross section and is provided with a plurality of vents **36**. The vents **36** are provided by the provision of tabs **38** which are bent or otherwise disposed out of the plane of the vents **36**. The tabs **38** are arcuate as illustrated and are integral with the cup-shaped body at their upper end. Thus, foreign matter introduced into the shield **22** will be directed toward the foundation **34** rather than toward the hood **20**.

As shown more clearly in FIGURE 2, the hood **20** comprises an annular cup-shaped inner member **42** and an outer cup-shaped member **44**. The inner and outer members **42** and **44** are concentrically disposed and interconnected by a screen **46** of heavy mesh wire. The inner member **42** is annular in transverse cross section so that it may receive the upper end of the pipe **18** and be supported thereon. The inner member **42** supports a charcoal filter **48** which filters out air-borne dust. It is well known that the most dangerous effect of an atomic blast to those people not in the immediate area thereof is the radioactive air-borne dust which may remain in the area for several weeks or be carried by the winds to areas which are remote from the center of the blast.

The shield **22** is preferably made from heavy plate steel or the like so as to withstand shock and foreign material which may fall thereon. The most dangerous rays of an atomic blast are the gamma rays. Gamma rays travel in straight lines. The disposition of the shield **22** with the arcuate tabs **38** and the disposition of the hood **20** precludes the possibility of gamma rays entering the inlet pipe **18**. The end of the intake pipe **18** disposed within the bombshelter **10** is preferably provided

with a cap **50** which may be readily removed when it is desired to utilize the ventilation system. In the event of floods, torrential rains, hurricanes, rupture of sewer or water pipes, etc., the cap **50** on the pipe **18** prevents the bombshelter **10** from being flooded through the intake pipe **18**.

The hood **28** is identical with the hood **20**. Accordingly, it is not deemed necessary to explain the hood **28** in detail. The intake pipe of the blower **26** is preferably provided with a selectively removable cap **52** which is identical with the cap **50**. The cap **52** is used in the same manner as cap **50** and performs the same function. Thus, if the level of the surface water is higher than the level of the upper ends of the pipes **18** and **24**, the caps **50** and **52** prevent the surface water from entering the bombshelter **10**. In order to prevent water from entering through the hatchway **14**, it will be obvious that the hatch at the ground level will be provided with a waterproof seal.

Thus, it will be seen that the ventilating system of the present invention includes a tamperproof shield for the hoods on the pipes **18** and **24**. Because of the arcuate shape of the tabs **38**, it is not possible to introduce an instrument such as a stick or the like through the vents **36** and directly contact the pipes **18** and **24**.

It will be obvious to those skilled in the art that the present invention may be utilized on a bombshelter which is only partially disposed underground. Such bombshelters which are only partially disposed underground are provided with a layer of earth thereabove. Accordingly, such bombshelters which are disposed only partially underground will appear in longitudinal transverse cross section as illustrated in FIGURE 1.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. A ventilation system comprising an underground enclosure, means providing entry and exit to said enclosure, an intake pipe having a first end in communication with said enclosure and a second end above ground level, an exhaust pipe having a first end in communication with said enclosure and a second end above ground level, a hood supported on the second end of each pipe, and a tamperproof shield surrounding each hood and the portion of each pipe disposed above ground level, the shield comprising a tubular main body having a closed imperforate upper end spaced above said hood and extending to below the ground level to be secured therein, said tubular main body having air vents therein.

2. A system in accordance with claim 1 wherein a foundation, said tubular main body being secured below ground level in said foundation, the uppermost surface of said foundation tapering in a direction away from the pipe juxtaposed thereto.

3. The ventilation system of claim 1 including tabs disposed within said shield, said tabs having one end integral with said tubular main body, said tabs corresponding in shape with said air vents, said tabs being arcuate in transverse cross section, and the end of said tabs opposite to said one end of said tabs being disposed between ground level and said one end of said tabs.

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