July 27, 1965 T. A. McHUGH, JR 3,196,813

BOMB SHELTER

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FIG. 1

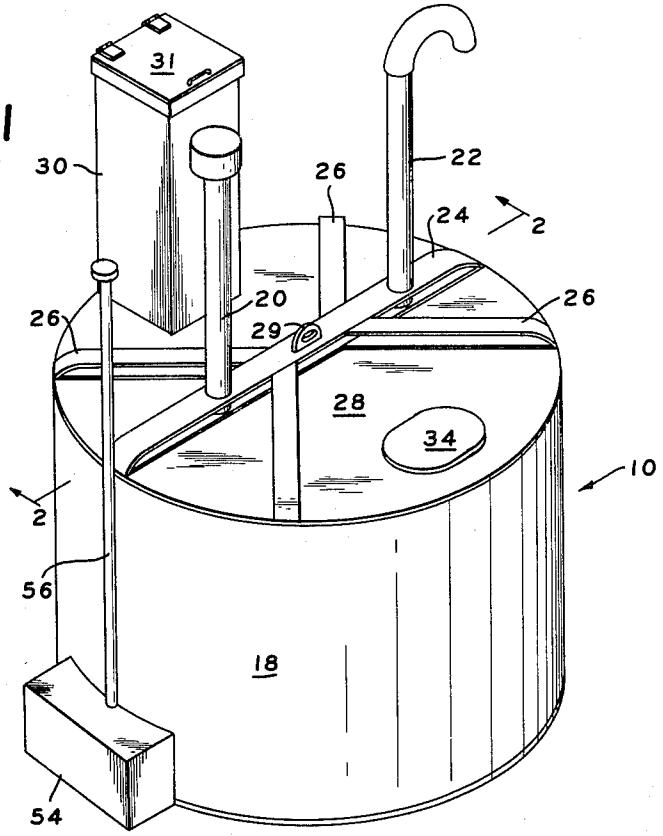

FIG. 6

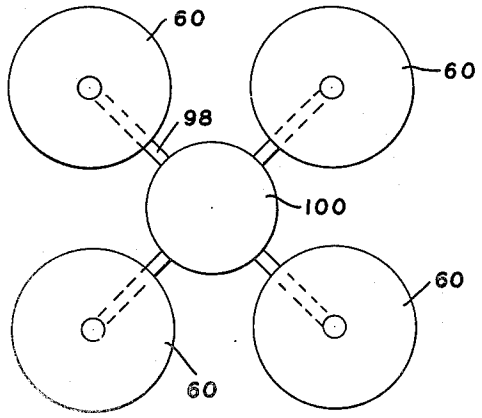

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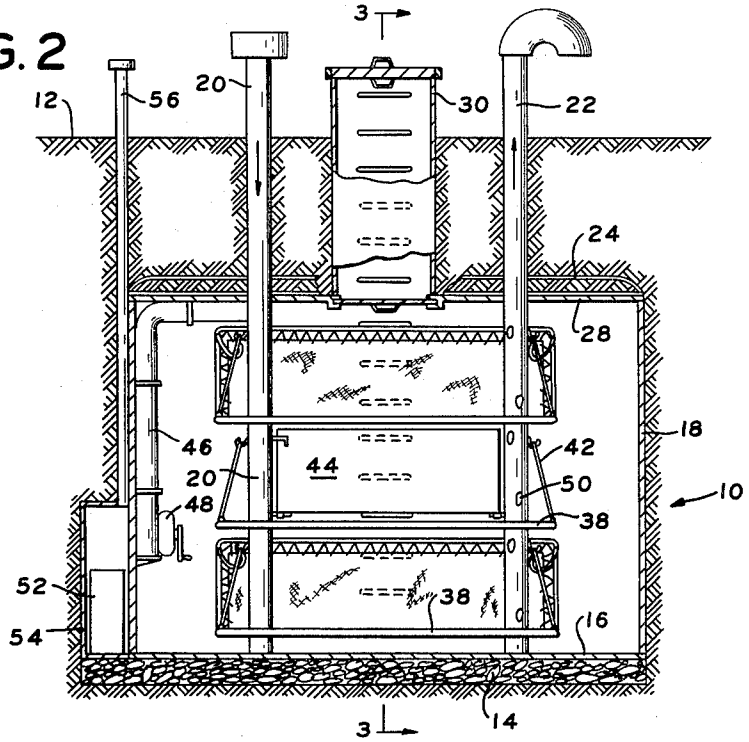
FIG. 2



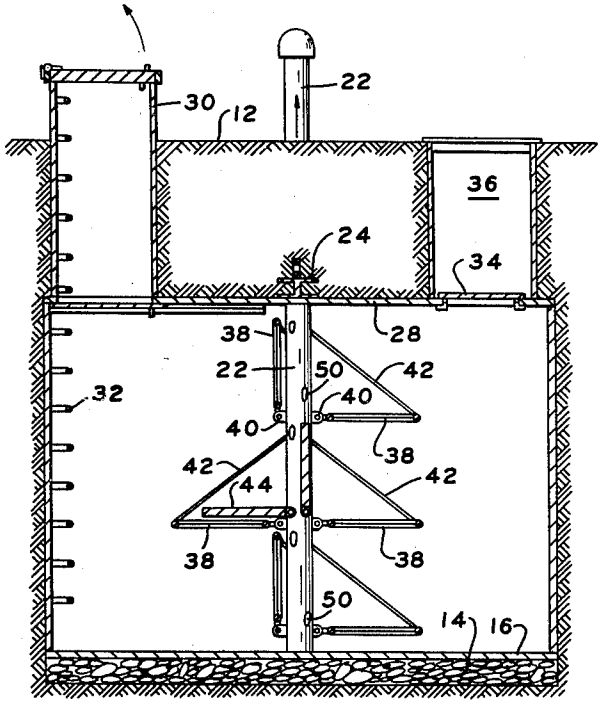


FIG. 3

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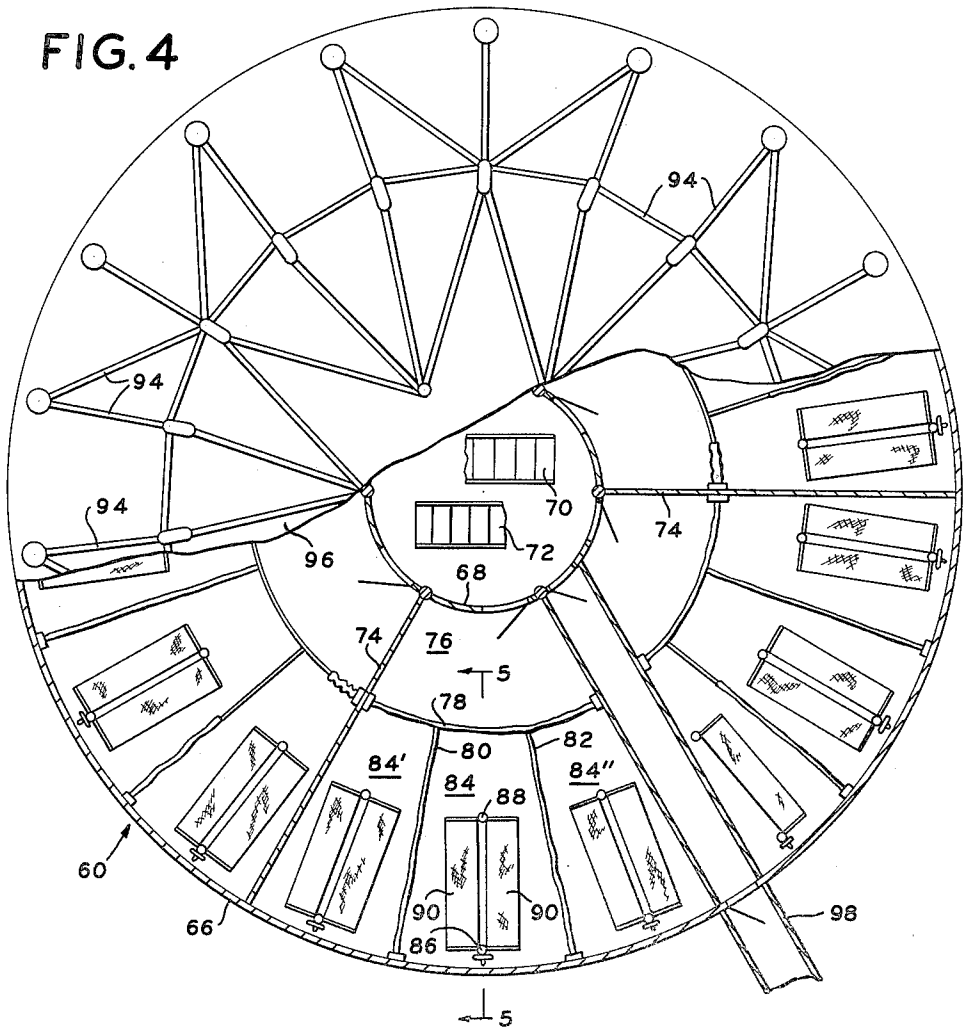
FIG. 4



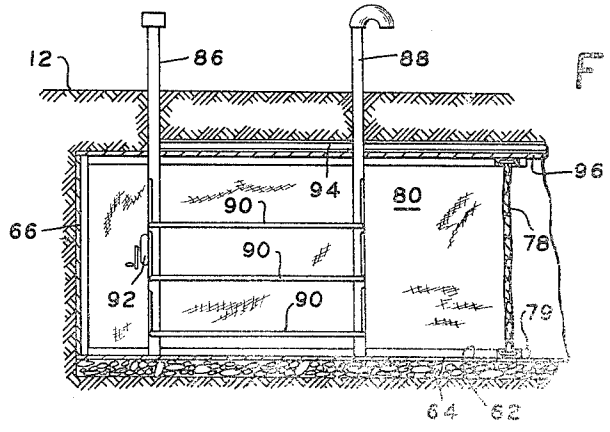


FIG. 5

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BOMB SHELTER

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3 Claims. (Cl. 109—1)

This invention relates to a bomb shelter, and more particularly to an underground bomb shelter.

A wide variety of bomb shelters have been proposed heretofore. The present invention is directed to a bomb shelter or multiple units thereof which is simple to construct and yet sufficiently large to provide mass protection for occupants thereof. The bomb shelter of the present invention is structurally interrelated in a manner whereby the ceiling is supported by the inlet and outlet pipes of the ventilation system. I have found that this permits me to utilize a thin steel shell for the walls of the bomb shelter. Thus, the walls will not support the weight of the ceiling and the earth thereabove. Also, the inlet and outlet pipes are positioned so that they support beds, tables and the like for the intended occupants. In this manner, a bomb shelter which is simple and provides adequate protection may be economically constructed.

Economy of construction is an important factor in the construction of a bomb shelter. A bomb shelter in accordance with the present invention may be substantially larger than known types of shelters at substantially the same cost of construction. The walls of the bomb shelter of the present invention are preferably a cylindrical shell. The motivating factor for such a wall is the cost and the fact that it presents a uniform exterior surface lacking sharp corners or crevices. Thus, the arcuate nature of the walls enables the bomb shelter to withstand greater pressures.

It is an object of the present invention to provide a novel bomb shelter.

It is another object of the present invention to provide a novel bomb shelter having a thin arcuate wall.

In is another object of the present invention to provide an underground bomb shelter wherein the weight of the ceiling and earth thereabove is supported by the inlet and outlet pipes of the ventilation system.

It is another object of the present invention to provide an underground bomb shelter wherein inlet and outlet pipes of the ventilation system support the weight of the ceiling and earth thereabove as well as beds for occupants of the bomb shelter.

It is still another object of the present invention to provide a public underground bomb shelter having a plurality of segmental chambers, each chamber having its own inlet and outlet ventilation system supporting the weight of the ceiling for the entire bomb shelter.

Other objects will appear hereinafter.

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

FIGURE 1 is a perspective view of the bomb shelter of the present invention.

FIGURE 2 is a sectional view taken along the lines 2—2 in FIGURE 1, with the bomb shelter being disposed underground.

FIGURE 3 is a sectional view taken along the lines 3—3 in FIGURE 2.

FIGURE 4 is a top plan view of another embodiment of the present invention, with portions being broken away for purposes of illustration.

FIGURE 5 is a sectional view taken along the lines 5—5 in FIGURE 4.

FIGURE 6 is a plan view of a cluster of interconnected bomb shelters of the type illustrated in FIGURES 4 and 5.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 a bomb shelter designated generally as 10. The bomb shelter 10 is adapted to be disposed below ground level 12 on a foundation 14. The foundation 14 may be a gravel bed. The bomb shelter 10 includes a floor 16 which supports an upright cylindrical shell 18. The shell 18 is a thin walled member and is preferably made of steel or the like. The wall 18 is preferably circular but may be elliptical.

An inlet pipe 20 and an outlet pipe 22 are supported by the gravel bed 14 and the floor 16. The pipes 20 and 22 are upright and extend to a point above ground level wherein they terminate in an inverted hood. An I-beam 24 is fixedly secured to the pipes 20 and 22. The I-beam 24 has a length which is substantially equal to the diameter of the cylindrical wall 18. A plurality of struts 26 extend from a central portion of the I-beam 24 to a periphery of the cylindrical wall 18. A carrying hook 29 is secured to the I-beam 24 intermediate its ends. A ceiling 28 is secured to and supported by the beams 24 and 26. The periphery of the ceiling 28 is sealed with respect to the upper edge of the cylindrical wall 18. Thus, it will be seen that the pipes 20 and 22 support the ceiling structure for the bomb shelter 10.

An escape hatch 30 extends upwardly from the ceiling 28 so that a lid 31 on its uppermost end will be above the ground level 12. The lid 31 is preferably slanted with its hinged end above its free end so that debris falls off the lid 31.

Ladder rungs 32 are secured to the inner surface of the wall 18. The escape hatch 30 is positioned adjacent a periphery of the bomb shelter 10 in line with the ladder rungs 32. Ladder rungs are also provided within the escape hatch 30. The ceiling 28 is provided with an emergency trap door in line with an emergency hatch 36.

In addition to being a principal part of the ventilation system and being the support members for the ceiling of the bomb shelter 10, the pipes 20 and 22 are spaced apart so that they may support a plurality of discrete beds 38. As shown more clearly in FIGURE 3, a plurality of beds 38 are disposed one above the other and supported by the pipes 20 and 22. A side edge of each bed 38 is pivotably secured to a hinge 40 on each pipe 20 and 22. The opposite edge of the beds are secured to the pipes 20 and 22 by means of a flexible cable 42. Hence, the beds may be moved from an operative to an inoperative disposition. The dispositions of the beds 38 are shown in FIGURE 3. A table 44 is pivotably secured to the pipes 20 and 22.

A branch pipe 46 communicates with the pipe 20 at any convenient location. For purposes of illustration, the branch pipe 46 is illustrated as being in communication with the pipe 20 adjacent the ceiling 28. A blower 48 is connected to the branch pipe 46. The blower 48 may be mechanically or manually operated to force circulation of air through the pipe 20 into the interior of the bomb shelter 10. The pipe 22 is provided with a plurality of holes 50 therein. The holes 50 enable air within the bomb shelter 10 to flow upwardly through the pipe 22 back to atmosphere. It is within the scope of the present invention to mount the blower 48 directly on the pipe 20. A sanitary tank 52 is disposed within an enclosure 54. The enclosure 54 is coextensive with the outer periphery of the wall 18. A door, not shown, provides communication between the interior of the bomb shelter 10 and the enclosure 54. The enclosure 54 is vented to atmosphere through the vent pipe 56. The

sanitary tank 52 is of sufficient capacity so that it may accommodate the waste of the occupants over an extended period of time.

When constructing the bomb shelter 10, a hole is dug into the ground. The gravel bed 14 is constructed. Thereafter, a pre-constructed bomb shelter 10 is lowered into position over the bed 14 by means of a cable engaged with the hook 29. Thereafter, earth is filled around the bomb shelter 10 so as to provide a layer of earth above the ceiling 28. The layer of earth above the ceiling 28 is sufficient to prevent gamma rays from entering the bomb shelter 10. It is believed that the manner is which the bomb shelter 10 is to be utilized is obvious and need not be described in detail.

There is shown in FIGURES 4 and 5 another embodiment of the present invention. The bomb shelter illustrated in FIGURES 4 and 5 is designated generally as 60. The bomb shelter 60 is a public bomb shelter having multiple units of the bomb shelter 10.

The bomb shelted 60 includes a floor 62 disposed over a foundation gravel bed 64. An upright cylindrical wall 66 is supported by the floor 62 and bed 64. The cylindrical wall 66 may be made from steel or the like. A cylindrical wall 68 is concentrically disposed within the wall 66. The wall 68 provides an entrance and exit means for the bomb shelter 60. Hence, stairs 70 and 72 are provided within the cylindrical wall 68. The cylindrical wall 68 will communicate with atmosphere or an underground enclosure such as a basement of a building, a subway, etc.

A plurality of division walls 74 extend between the walls 66 and 68 thereby dividing the interior of the bomb shelter 60 into a plurality of segmental chambers 76. Each of the segmental chambers 76 are identical.

A curtain 78 has its upper and lower edges slidably supported by an arcuate track 79 on the floor 62 and ceiling of the bomb shelter 60. Curtains 80 and 82 cooperate with the curtain 78 to divide the space between curtain 78 and wall 66 into three rooms 84, 84' and 84". Each of the rooms 84, 84' and 84" are provided with an inlet pipe 86 and an outlet pipe 88.

Each of the pipes 86 and 88 pivotably supports beds 90 in the same manner as illustrated in FIGURES 2 and 3. The bomb shelter 60, as illustrated, is designed to accommodate 105 persons. Hence, each of the pipes 86 and 88 pivotably supports six beds 90. A manually or mechanically operable blower 92 is supported by each of the pipes 86. Each of the pipes 88 are provided with holes so that air may flow from within the room to atmosphere.

The pipes 86 and 88 are interconnected by support members 94 which may be I-beams. A ceiling 96 for the bomb shelter 60 is secured to the support members 94. Hence, the pipes 86 and 88 support the ceiling 96 and the earth thereabove in the same manner as described above in regard to bomb shelter 10. It will be appreciated that doors are provided in the wall 68 so as to provide selective access to the various segmental chambers 76. Likewise, the curtains 78 will be provided with moveable sections so as to provide access to the various rooms 84, 84' and 84".

As shown more clearly in FIGURE 6, a plurality of

bomb shelters 60 may be interconnected to form a cluster of bomb shelters. A connecting passage 98 will interconnect the various bomb shelters 60 with an entrance and escape hatch 100. As illustrated, the cluster will accommodate more than 400 persons. Accordingly, the escape hatch 100 may be provided with an elevator to facilitate movement of persons from ground level to the connecting passage 98.

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 bomb shelter comprising a floor, an upright annular wall consisting of a thin shell on said floor, a roof extending across said annular wall at a point remote from said floor, first and second pipes supported by said floor, the weight of said roof being supported by said pipes, each pipe providing communication between the atmosphere and the space within said annular wall, means for providing selective access to said space, and a plurality of beds supported by said pipes.

2. A bomb shelter comprising a floor, an upright annular wall consisting of a thin shell on said floor, a roof extending across said annular wall at a point remote from said floor, first and second pipes supported by said floor, the weight of said roof being supported by said pipes, each providing communication between the atmosphere and the space within said annular wall, means for providing selective access to said space, said space being divided into a plurality of segmental chambers, and each chamber being provided with said first and second pipes.

3. A bomb shelter in accordance with claim 2 including a second annular wall supported by said floor spaced radially inwardly from said first-mentioned annular wall, separator walls extending between said walls to define said segmental chambers, and said means for providing selective access to said space including a door means in said second annular wall.

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HARRISON R. MOSELEY, *Primary Examiner.*