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(54) **COMPACT INTERIOR SAFE ROOM**

(52) **U.S. Cl. 52/79.1; 52/309.1; 52/745.21**

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(57) **ABSTRACT**

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Publication Classification

(51) **Int. Cl.**
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E04C 2/20 (2006.01)
E04B 1/38 (2006.01)

The Compact Interior Safe Room is a new concept in the field of interior storm shelters and safe rooms. It offers the public a convenient and economical means to install a relatively strong, sturdy, and dependable interior storm shelter and safe room refuge in an existing building. While many manufacturers of current interior storm shelters require the installation of their interior storm shelter at the time of construction of the building that will house the shelter, the Compact Interior Safe Room is designed to be assembled inside the consumer's existing home in an economical manner, with a minimum of inconvenience to the consumer, and with minimal alterations to the existing room. The economic price of the Compact Interior Safe Room will make an interior storm shelter and safe room available to consumers who may not be able to afford the more expensive storm shelters.

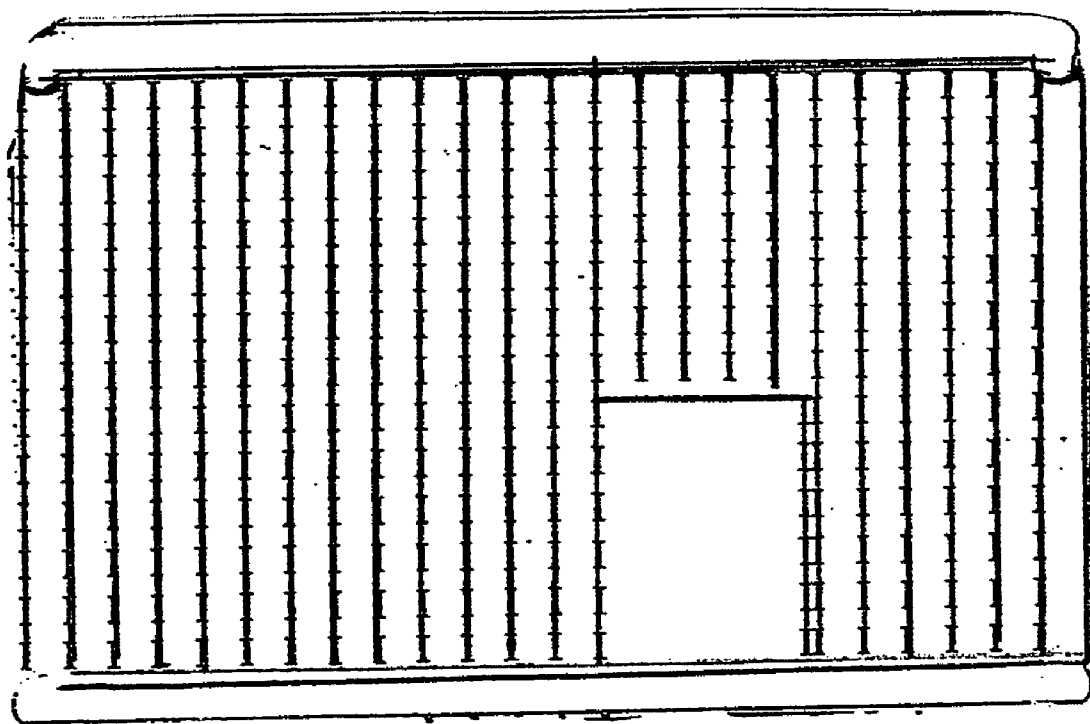


FIGURE 1

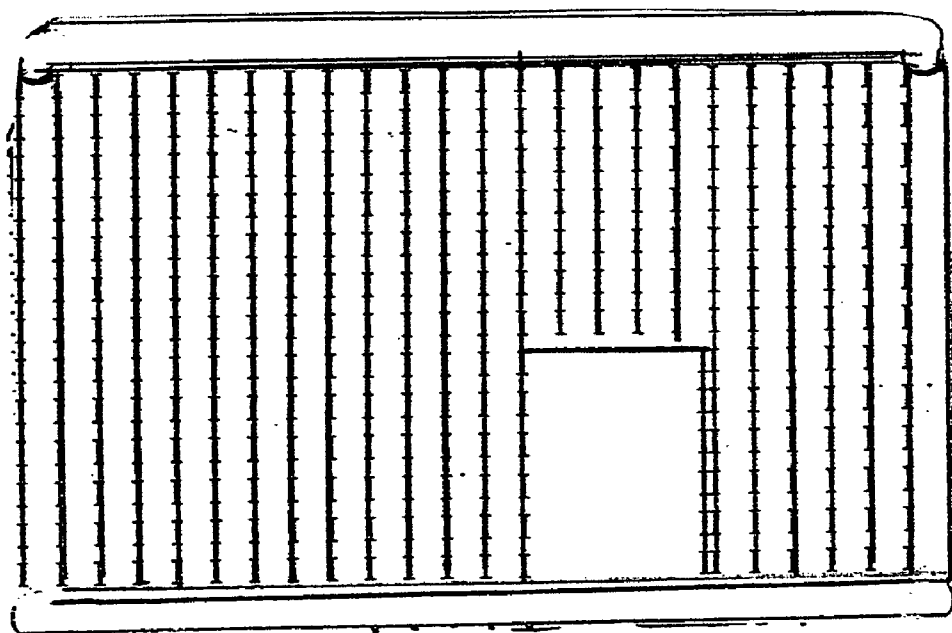


FIGURE 2C

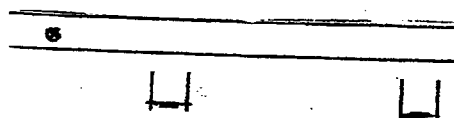


FIGURE 2A

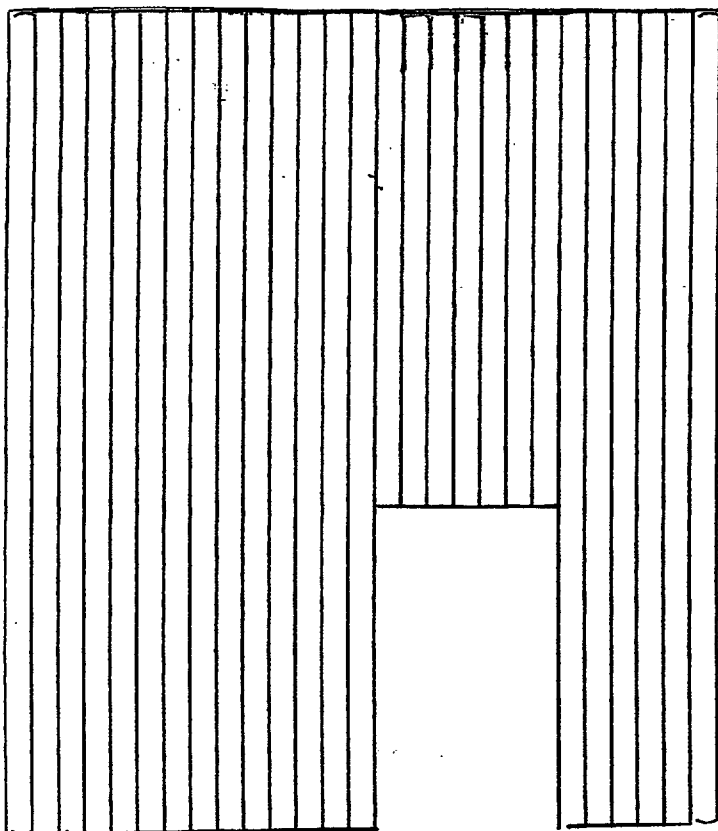


FIGURE 2B

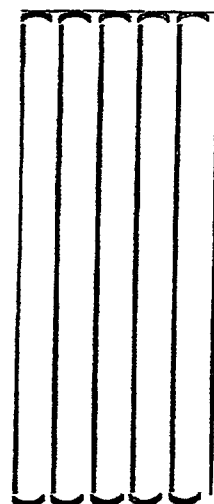


FIGURE 3A

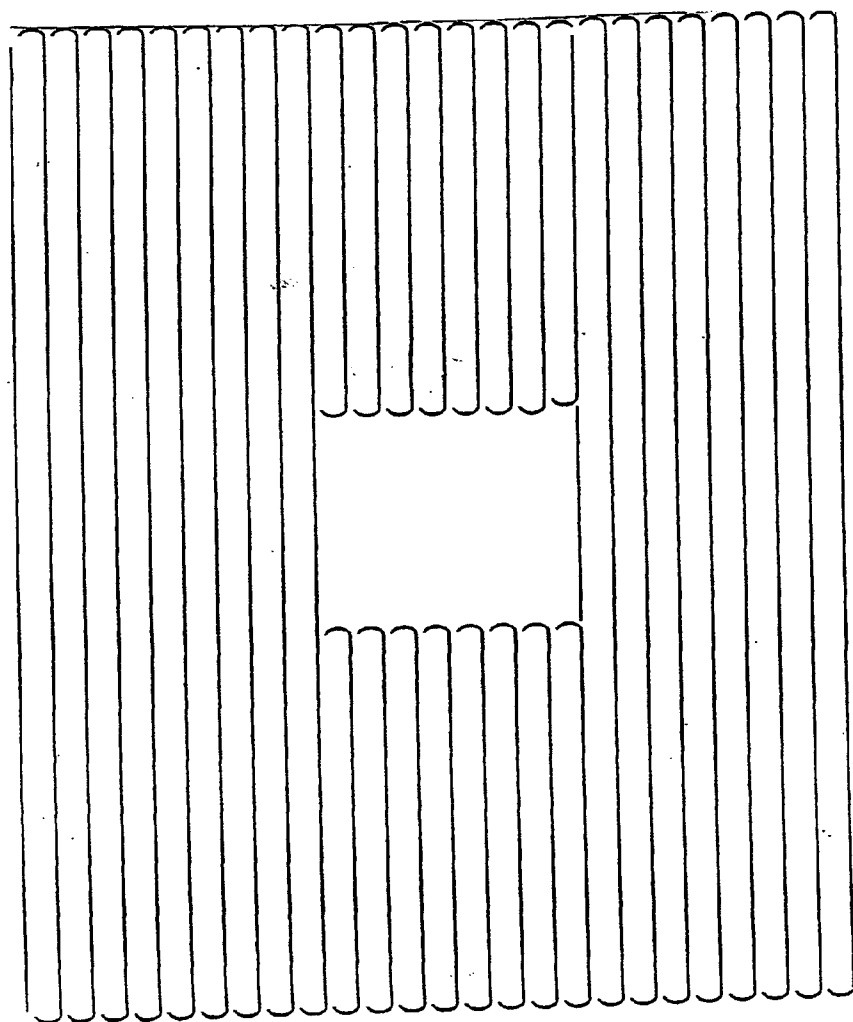


FIGURE 3B

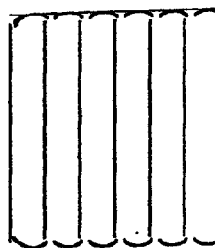


FIGURE 4A

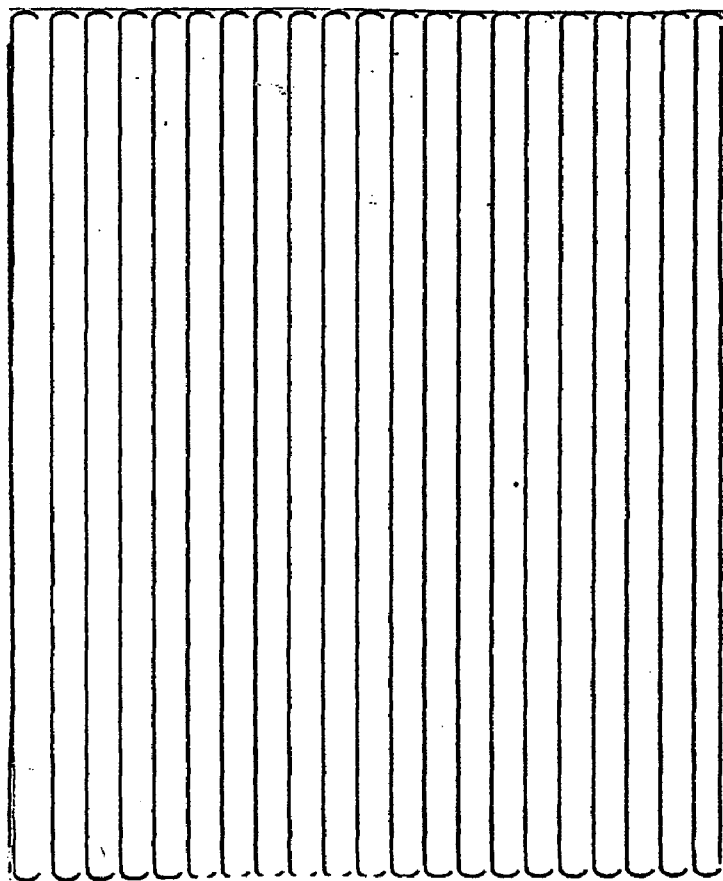


FIGURE 4B

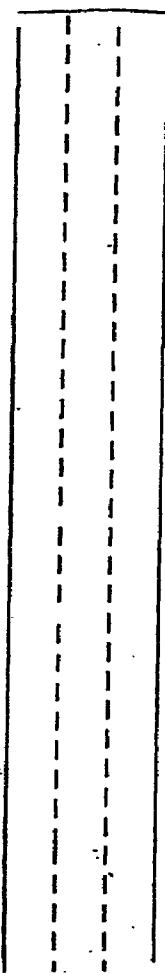


FIGURE 5

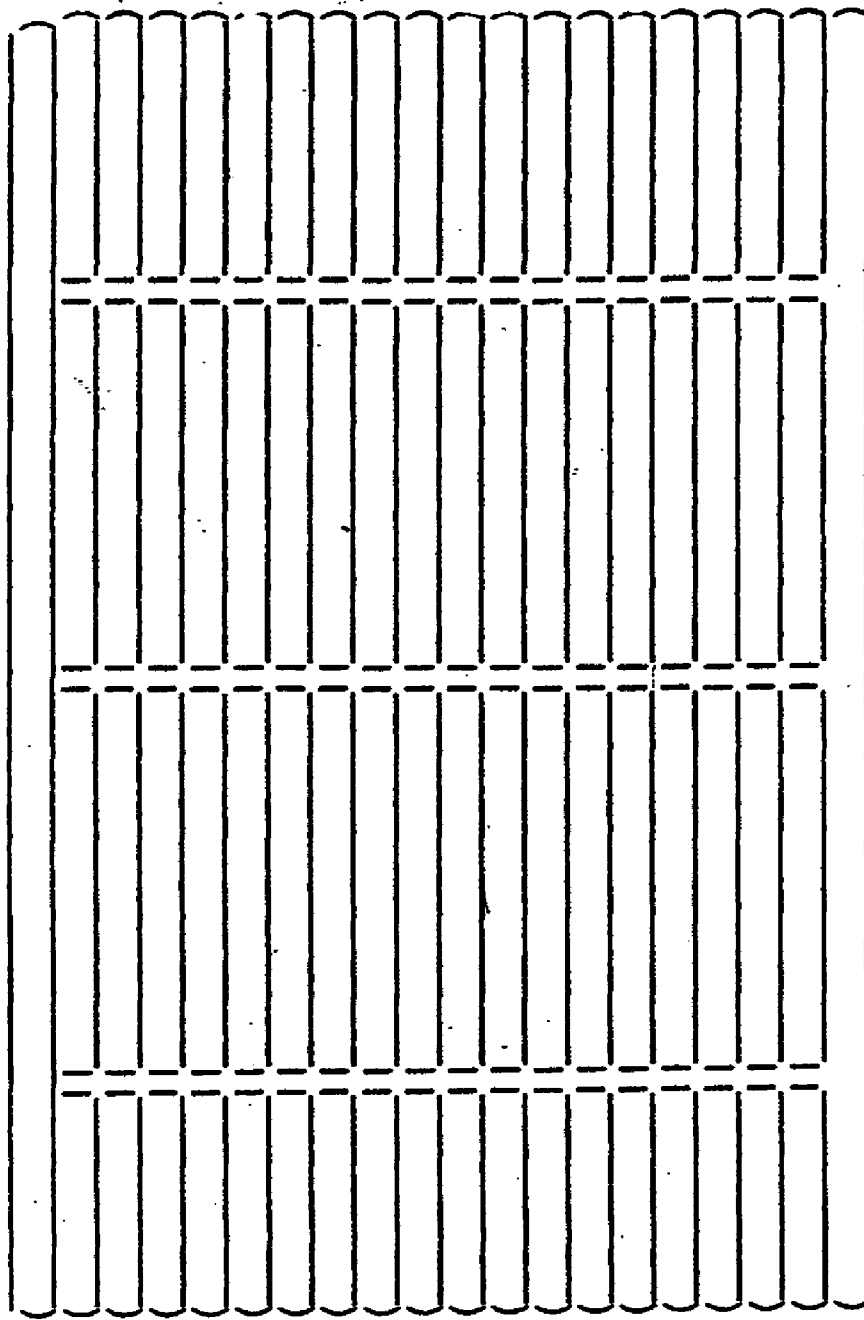


FIGURE 6B

FIGURE 6A

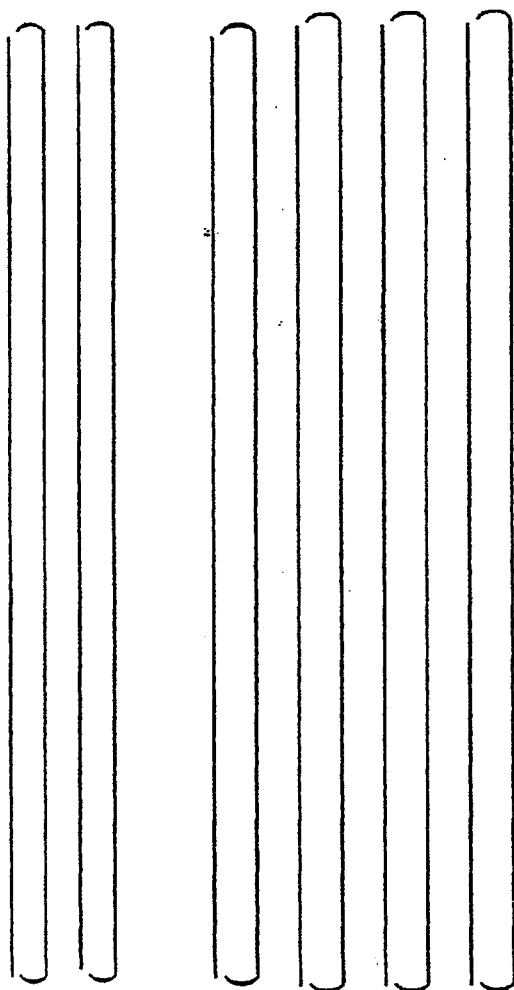


FIGURE 6D



FIGURE 6C



COMPACT INTERIOR SAFE ROOM

CROSS REFERENCES TO RELATED APPLICATIONS

[0001] There are no related applications.

STATEMENT OF FEDERALLY SPONSORED RESEARCH/DEVELOPMENT (IF ANY)

[0002] Not Applicable.

REFERENCE TO A SEQUENCE LISTING

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] The Compact Interior Safe Room is an indoor storm shelter and safe room. As such the Compact Interior Safe Room may be classified under Class 109: Safes, Bank Protection, Or Related Device: Class (A) Safes; which includes all buildings and receptacles which feature the means for repelling or protecting their contents (including living beings) from explosions, penetration of missiles, other attacks by force or stealth, (including burglary or larceny), or for any other protective, or safeguarding purpose not elsewhere provided for.

[0005] The Compact Interior Safe Room is an innovation in the field of storm shelters in as much as it is readily available for installation in existing buildings, compared to many of the current versions which are restricted to installation in new buildings prior to occupancy. The Rigid Schedule 40 PVC Pipe that the Compact Interior Safe Room is comprised of is much lighter and easier to handle than the metal and concrete materials that are more common in the field to date, while the Rigid Schedule 40 PVC features considerable sturdiness and strength that provides more convenient and economical protection to the consumers.

[0006] The Compact Interior Safe Room is the invention featured in the Provisional Patent Application No. 60/819, 886 filed Jul. 12, 2006, confirmation #7447.

BRIEF SUMMARY OF THE INVENTION

[0007] The general idea of the Compact Interior Safe Room is to provide substantial protection against injuries from wind-born debris during tornadoes, and to provide a safe room inside a building. The Compact Interior Safe Room will provide a readily accessible refuge without exposing the consumers to wind-blown debris, hail, and/or lightning while seeking to access the shelter. Exterior shelters expose the consumers to these risks.

[0008] The object of the Compact Interior Safe Room is to provide a reasonably strong and secure storm shelter and safe room at a more affordable price than those currently on the market. Due to the light weight and adaptability of the Rigid Schedule 40 PVC Pipe, while its strength, durability, and sturdiness provide reasonable protection, the Compact Interior Safe Room can be more economically assembled and installed in an existing building than previous products in the field of interior storm shelters and safe rooms. Due the adaptability of the Rigid Schedule 40 PVC Pipe, the Compact Interior Safe Room can be assembled in a room in an existing building with a minimum of inconvenience to the consumer, and with minimal alterations to the chosen room.

[0009] The Compact Interior Safe Room can be installed to conform to the dimensions of an existing room, or to meet the specifications of the consumer. While previous and current shelters and safe rooms are designed exclusively to provide shelter in an emergency situation, and are often inconvenient to access for use, the Compact Interior Safe Room can be furnished with a bed and accessories to allow the consumer to sleep inside the Compact Interior Safe Room overnight when there is a threat of stormy weather. The consumer won't have to wait for a tornado sighting or a weather service's warning to take shelter when severe weather strikes. The risk of not being able to access the shelter safely during a storm is eliminated in this way.

[0010] The Compact Interior Safe Room can be assembled to meet the consumer's specifications, which can provide an option to utilize the safe room for other purposes when it is not required for use as a storm shelter. Previous and current storm shelters and safe rooms in that field are designed to be used only for that primary purpose. Therefore, the consumer is denied other use of the space occupied by the shelter. The Compact Interior Safe Room provides a practical alternative for the consumer.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0011] FIG. 1 shows the frontal view of the Compact Interior Safe Room. This view shows the wall featuring the entry, the top, the bottom, two corner-post units, and the way these units appear after being assembled.

[0012] FIG. 2A shows a view of the Compact Interior Safe Room wall that features the entry door opening into the Compact Interior Safe Room. The dimensions of the structure of this wall will conform to the dimensions of the existing room into which the Compact Interior Safe Room will be assembled, or to the consumer's specifications.

[0013] FIG. 2B shows a view of the door assembly for the Compact Interior Safe Room. The door will be assembled in conjunction with the door-way into the existing room in which the Compact Interior Safe room will be assembled. The dimensions of the door will conform to the dimensions of the door-way into the existing room.

[0014] FIG. 2C shows a view of the bar-and-brackets assembly that will firmly and securely close the door from the interior of the Compact Interior Safe Room. The brackets will be securely attached to PVC lengths in the door. The bar will be connected to a PVC length in the wall assembly by a swiveling connection that will allow the bar to be easily rotated into the brackets to securely close the door into the Compact Interior Safe Room and secure it from inside the Compact Interior Safe Room. (This same bar-and-brackets assembly will be used to secure the covering for the window/emergency exit that will be an optional part of another wall that may be assembled in line with an exterior window in the existing room into which the Compact Interior Safe Room is assembled.)

[0015] FIG. 3A shows a view of the wall of the Compact Interior Safe Room that features an opening which will be in line with an exterior window in the room into which the Compact Interior Safe Room will be installed. The purpose for this opening is to provide an alternative exit from the Compact Interior Safe Room to be used in the event that the door-way into the Compact Interior Safe Room cannot be opened from inside the Compact Interior Safe Room.

[0016] FIG. 3B shows the small door that will be used to cover the opening in the wall of the Compact Interior Safe Room that is lined up with an exterior window in the existing room. (When the Compact Interior Safe Room is occupied, this small door will be secured from inside using the bar-and-brackets assembly shown in FIG. 2C.)

[0017] FIG. 4A shows a view of one of the solid walls of the Compact Interior Safe Room. At least two of the walls will be solid, with the window/exit opening in a third wall being optional.

[0018] FIG. 4B shows a view of a length of 3" Rigid Schedule 40 PVC Pipe that has been split length-wise, and reinforced for added strength and sturdiness by the insertion of a 2" Rigid Schedule 40 PVC Pipe length, as depicted by the broken lines in the diagram. These reinforced lengths will be used to assemble the walls, and as the 3 horizontal bracing lengths across the top assembly.

[0019] FIG. 5 shows a view of the top assembly of the Compact Interior Safe Room. The top assembly is comprised of intact lengths of Rigid Schedule 40 PVC Pipe that has not been split length-wise, and three lengths of reinforced 3" Rigid Schedule 40 PVC Pipe positioned across the assembly of the intact lengths for added strength, durability, and security.

[0020] FIG. 6A shows a view of two of the intact lengths of Rigid Schedule 40 PVC Pipe that have not been split length-wise. Each end of these lengths will be connected to a corner-post using a Rigid Schedule 40 double-elbow with outlet fitting joint. Four of these intact lengths will comprise the means to firmly secure the top assembly of the Compact Interior Safe Room to the wall assembly. Another four of these lengths will comprise the means to securely anchor the Compact Interior Safe Room to the floor of the building in which the Compact Interior Safe Room is installed.

[0021] FIG. 6B shows a view of four of the intact lengths of Rigid Schedule 40 PVC Pipe that will be used to comprise the corner-posts of the Compact Interior Safe Room. The corner-posts will comprise the means to securely connect the walls together and to comprise the means to firmly frame and secure the top assembly to the walls of the Compact Interior Safe Room. In addition, the corner-posts will comprise the means to frame the base of the Compact Interior Safe Room and securely anchor it to the floor of the building in which it is assembled.

[0022] FIG. 6C shows a view of the Rigid Schedule 40 PVC Pipe fitting joint that will be used to connect the corner-posts to the four intact lengths of Rigid Schedule 40 PVC Pipe that will comprise the horizontal frame that will secure the top assembly to the walls of the Compact Interior Safe Room. To secure the top, the double-elbow with outlet will be used with the outlet pointing down, extending into the opening at the top of a corner-post. Each end will be joined to an end of an intact length of Rigid Schedule 40 PVC Pipe to form a four-length frame over the top assembly. To securely anchor the Compact Interior Safe Room to the floor of the building in which it is installed, the double-elbow with outlet fitting joint will be turned so that the outlet is pointing upward and extended into the corner-post. Each end of the fitting will be connected to an end of an intact Rigid Schedule 40 PVC length in a way that comprises a four-length frame beneath the floor of the room in which the Compact Interior Safe Room is assembled.

[0023] FIG. 6D shows a view of a length of Rigid Schedule 40 PVC Pipe that has been split length-wise. This length will not be reinforced by the insertion of a length of 2" Rigid

Schedule 40 PVC Pipe. This length will be used to directly connect the top and the walls together. The split length will be used to make the connection by being placed in position between the top assembly and the wall assembly. The length will be rotated to position it so that there is adequate contact with the top of the wall and the surface of the abutting intact length of Rigid Schedule 40 PVC Pipe. Metal screws will then be drilled through the upper part of this rotated connecting length, into the intact lengths of PVC comprising the edge of the top assembly. Metal screws will then be drilled through the lower part of this rotated length, into the top lengths of Rigid Schedule 40 PVC Pipe comprising the wall assembly.

DETAILED DESCRIPTION OF THE INVENTION

[0024] The Compact Interior Safe Room is an interior storm shelter and safe room that is comprised of Rigid Schedule 40 PVC Pipe, which is a new and innovative concept in the field of storm shelters and safe rooms. The Compact Interior Safe Room will provide protection from dangers associated with tornadoes, other types of wind storms, and refuge from intruders. The Compact Interior Safe Room offers the advantage of an easily accessed storm shelter without exposure to lightning, hail, and wind-born debris that a person might otherwise be exposed to when one's shelter is located outdoors.

[0025] The Rigid Schedule 40 PVC Pipe used in the construction of the Compact Interior Safe Room is an improvement in the field of storm shelters and safe rooms because the light weight of the rigid PVC Pipe with its quality of rigidity, sturdiness, and strength is an advantage over such materials as metals and concrete previously used in the construction of interior storm shelters. The properties of the Rigid Schedule 40 PVC Pipe more effectively allow a flexible degree of pre-assembly of some of the component parts of the Compact Interior Safe Room at an established production location, and will allow easier assembly at the construction site.

[0026] The Rigid Schedule 40 PVC Pipe lengths will be pre-cut to the length desired, and the necessary pre-drilled holes in the PVC Pipe will be drilled at the production location. Varying degrees of pre-assembly will be completed at the production location, while the remaining components will be assembled at the installation site, per the consumer's specifications. Due to its lighter weight, compared to metal and concrete materials, the PVC component parts will be easier to maneuver into the chosen room for the assembly of the Compact Interior Safe Room and, therefore, the assembly will be more efficient, with minimal inconvenience to the consumer, and minimal alterations to the room in which the Compact Interior Safe Room is installed.

[0027] The dimensions of the Compact Interior Safe Room can be arranged in such a manner that the room containing the Compact Interior Safe Room can be utilized for other purposes when not being used for protection during a storm. The Compact Interior Safe Room can be furnished with a bed, which will not only allow the consumer to sleep in the Compact Interior Safe Room on nights when stormy weather threatens without waiting for a tornado sighting before seeking shelter, but the consumer will have the option of using that room as a bedroom when it is not needed for shelter.

[0028] The primary component parts of the Compact Interior Safe Room are: 4 walls comprised of 3" Rigid Schedule 40 PVC Pipe lengths which are split length-wise; 4 corner-posts comprised of 3" Rigid Schedule 40 PVC Pipe lengths that have not been split; a top frame comprised of 4 lengths of

Rigid Schedule 40 PVC Pipe lengths that have not been split; a top assembly comprised of intact lengths of Rigid Schedule 40 PVC which have not been split; and 3 lengths of reinforced 3" Rigid Schedule 40 PVC Pipe; and a bottom frame comprised of 4 intact lengths of 3" Rigid Schedule 40 PVC Pipe that have not been split.

[0029] The walls of the Compact Interior Safe Room are comprised of the split lengths of Rigid Schedule 40 PVC Pipe which are connected together in a vertical position by metal bolts placed into pre-drilled holes in the PVC Pipe, spaced 12 inches apart. Each of the metal bolt connections are comprised of the metal bolt, a washer on each side of the hole in the PVC Pipe, a lock washer, and a metal nut securely tightened in place against the PVC Pipe. All but 8 of the split PVC lengths in the walls will be reinforced by the insertion of a 2" PVC Pipe length that has been split length-wise. This 2" PVC Pipe insertion will first be glued into place inside the 3" PVC length at the production location. At the assembly site the 2" insertion will be further secured by metal bolts placed into pre-drilled holes in the PVC Pipe. These bolts will also be secured by a metal washer on each side of the PVC Pipe, a lock washer next to the second washer, and a metal nut, which will be firmly tightened into place against the lock washer. These bolts will be placed in line with the bolts that connect the 3" PVC lengths together at 12 inch intervals.

[0030] The dimensions of the walls will conform to the dimensions of the walls in the existing room into which the Compact Interior Safe Room will be installed, or to the consumer's specification. (The shorter the height of the Compact Interior Safe Room, the stronger and sturdier the Compact Interior Safe Room will be.)

[0031] Two walls of the Compact Interior Safe Room will be of solid construction. One of the other walls will feature an opening for a door that will be aligned with the door that opens into the room into which the Compact Interior Safe Room is installed. The door will be hinged in a manner that will allow it to open toward the interior of the Compact Interior Safe Room. It will be secured from the inside of the Compact Interior Safe Room by a metal bar firmly attached to a PVC length by a swiveling connection. This will allow the bar to be easily swung into position in two metal brackets attached to the PVC lengths on each side of the doorway for maximum security.

[0032] As an available option, the fourth wall may be constructed to allow an opening aligned with an existing exterior window in the existing room into which the Compact Interior Safe Room is installed. This opening will feature a smaller door than the entry door, and it will be hinged and secured by a bar and brackets in the same way. This will provide an alternative exit from the Compact Interior Safe Room if the entry door should be blocked. When secured from inside by the bar placed in the brackets, it will also provide protection from wind-borne debris and from intrusion from outside of the building at other times.

[0033] The 4 corner-posts will primarily serve to connect the bottom frame to the top frame, to secure the top in position, and to connect the 4 walls together. The bordering length at each end of the walls will be comprised of a split length of Rigid Schedule 40 PVC Pipe that has not been reinforced by the insertion of a length of 2" PVC Pipe. One side of each bordering length will be connected to an adjoining split length in the wall. The other side of that length will be attached to a corner-post by metal screws drilled through the

split length of PVC Pipe into the corner-post. This procedure will be repeated until all four walls are securely connected to the four corner-posts.

[0034] The corner-posts will extend in height slightly above the height of the lengths in the walls. At the top of each corner-post a Rigid Schedule 40 double-elbow with side outlet fitting joint will be connected to the corner-post. The side-outlet will extend downward into the top of the corner-post. Each end of the double-elbow will be connected to an intact length of Rigid Schedule 40 PVC Pipe that has not been split, and these lengths will be securely placed over the top unit of the Compact Interior Safe Room to secure the top in place. Metal screws will be drilled into the fittings to securely connect the fittings, the PVC lengths, and the corner-posts together.

[0035] The bottom of the corner-posts will extend below the floor of the room into which the Compact Interior Safe Room will be installed. A Rigid Schedule 40 double-elbow with side outlet fitting joint will be attached to the bottom of the corner-post. The side outlet will be pointed upward to fit into the corner-post. Each end of the double-elbow fitting will be connected to one of the intact 3" Rigid Schedule 40 PVC Pipe lengths that have not been split. These lengths will then be firmly secured against the floor of the existing room into which the Compact Interior Safe Room is assembled to provide a secure anchor for the Compact Interior Safe Room. The connections that connect the corner-posts, the lengths, and the fittings together will be secured in place by metal screws drilled into the PVC Pipe.

[0036] The top assembly is comprised of intact lengths of 3" Rigid Schedule 40 PVC Pipe that have not been split length-wise. Every length will be connected to an adjoining length by metal bolts inserted at the end of the lengths. Each bolt connection will be comprised of a metal bolt, a washer on each side of the PVC Pipe, a lock washer, and a metal nut firmly tightened against the lock washer. The top assembly will be further strengthened by placing 3 lengths of 3" Rigid Schedule 40 PVC Pipe, which has been split and reinforced, horizontally across the intact lengths of the top unit. (The 2" PVC inserts will be glued and bolted to the 3" PVC like the procedure used in the walls.) These reinforced units will be secured in place by drilling metal screws upward through the split PVC lengths into the intact PVC lengths of the top assembly.

[0037] 4 lengths of 3" Rigid Schedule 40 PVC Pipe that have been split length-wise, but not reinforced, will be used around the sides of the Compact Interior Safe Room to connect the top assembly to the upper edge of the walls. These lengths will serve as a border link between the top assembly and the walls. These split lengths will be placed up between the walls and the top with the open interior of the split length facing into the Compact Interior Safe Room. The length will be rotated so that the top part of it will make adequate contact with an intact length in the top assembly to allow metal screws to be driven into the PVC lengths and firmly connect them together. Then metal screws will be driven through the bottom part of the split length of PVC Pipe into the lengths of PVC Pipe in the walls. This procedure will be repeated all around the perimeter of the Compact Interior Safe Room.

[0038] The bottom frame will be comprised of 4 lengths of intact 3" Rigid Schedule 40 PVC Pipe lengths that have not been split. In addition to the connections at the corner-posts, the PVC lengths in the bottom frame will be secured in place by straps attached to the floor under the room in which the

Compact Interior Safe Room is assembled. The straps will be placed at three feet intervals to securely anchor the Compact Interior Safe Room.

[0039] The intended order of assembly of the Compact Interior Safe Room is: 1.) The frame beneath the floor is secured in position; 2.) The corner-posts are erected; 3.) The upper frame is secured in position, with the downward pointing bolts ready for connecting to the frame lengths to the top assembly; 4.) The top assembly will be secured in place; 5.) The walls will be assembled; 6.) The entry door will be installed, with the swiveling bar and brackets; 7.) The small door covering the window opening, if that option is chosen, will be installed last.

1. The Compact Interior Safe Room is comprised of Rigid Schedule 40 PVC Pipe lengths. The 3" lengths, of which the vertical walls are comprised, are split length-wise and reinforced with 2" Rigid Schedule 40 PVC Pipe, which has also been split length-wise, to provide considerable protection from the dangers presented by tornadoes at lower costs than interior shelters and safe rooms that are made of stone, concrete, or metal materials. Other units of the Compact Interior Safe Room are comprised of lengths of Rigid Schedule 40 PVC Pipe that have not been split length-wise. The use of lengths of Rigid Schedule 40 PVC Pipe that have been split length-wise and reinforced for added strength, durability, and

sturdiness, is a new and innovative concept in the field of interior storm shelters and safe rooms.

2. Due to the light weight of the Rigid Schedule 40 PVC Pipe, the Compact Interior Safe Room can be custom-sized and assembled inside an existing room in a manner that allows the Compact Interior Safe Room to conform to the dimensions of that room, or the consumer's specifications. This flexibility of design will allow the consumer to utilize the Compact Interior Safe Room for other purposes when it is not being used as a shelter. The consumer has an option to furnish the Compact Interior Safe Room in a manner that will allow the Compact Interior Safe Room to be used for other desired purposes when it is not being used as an interior storm shelter or safe room refuge. This is a new and innovative concept in the field of interior storm shelters and safe rooms.

3. The Compact Interior Safe Room is securely, firmly, and sturdily assembled to provide a strong, dependable interior storm shelter and safe room. However, the method of assembly utilizing strong, sturdy connections comprised of non-corrosive metal bolts, washers, and metal screws, will allow the Compact Interior Safe Room to be dis-assembled from the room in which it was originally installed, and re-assembled in a different location if the consumer moves to a different building. This is a new and innovative concept in the field of interior storm shelters and safe rooms.

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