Nov. 29, 1966 F. V. LOCKMAN 3,287,865

SECTIONAL TIERED VAULT STRUCTURE

Filed Nov. 5, 1962 4 Sheets-Sheet 1

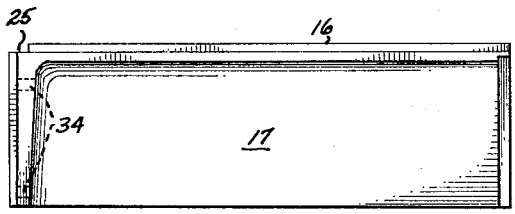

Fig. 4.

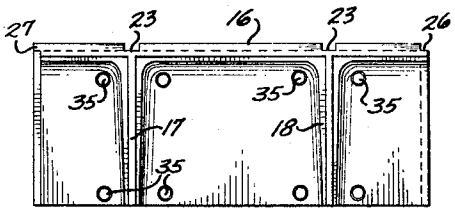

Fig. 5.

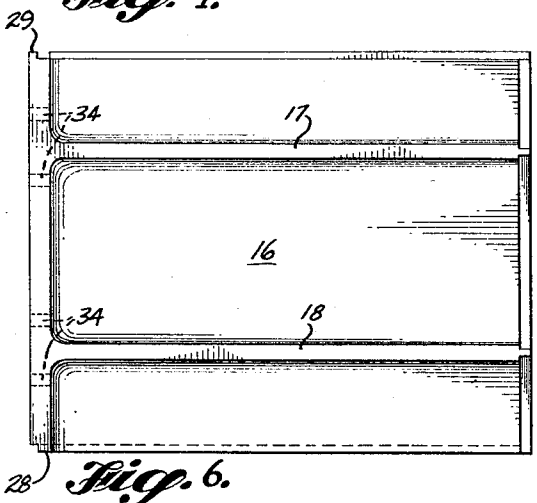

Fig. 6.

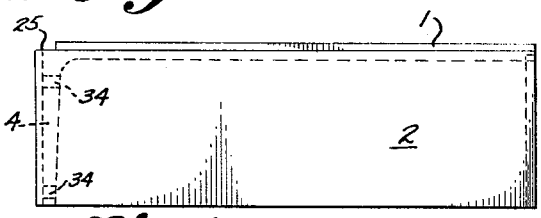

Fig. 1.

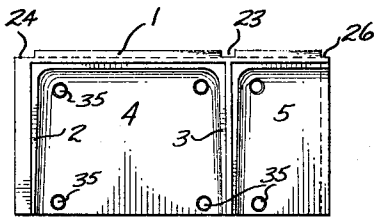

Fig. 2.

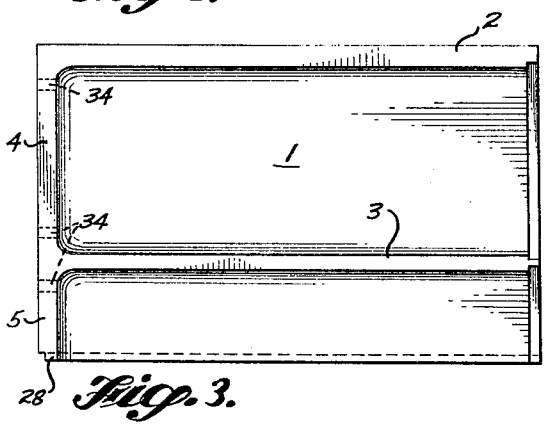

Fig. 3.

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SECTIONAL TIERED VAULT STRUCTURE

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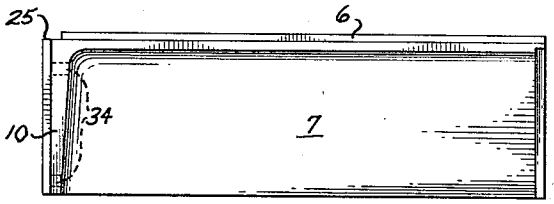

Fig. 10.

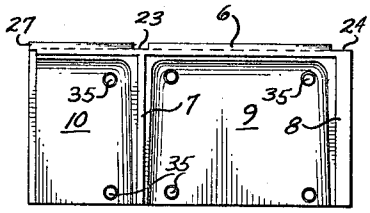

Fig. 11.

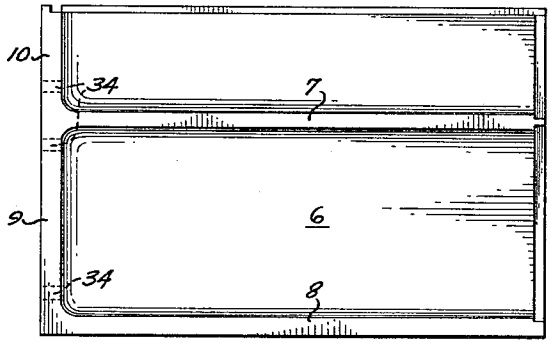

Fig. 12.

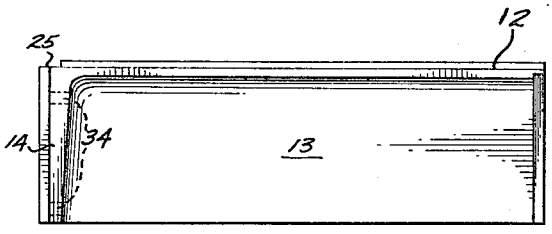

Fig. 7.

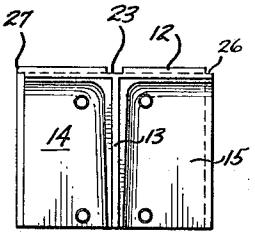

Fig. 8.

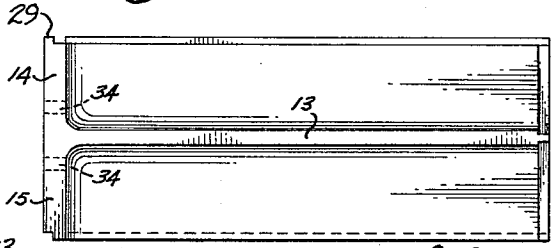

Fig. 9.

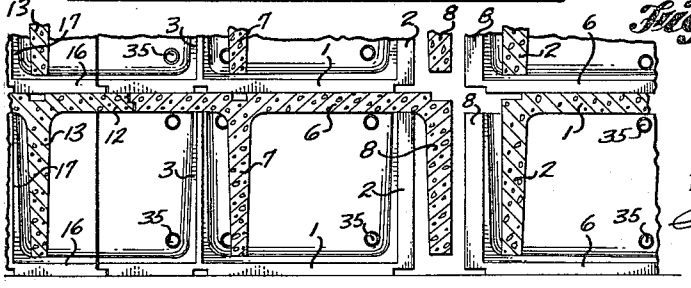

Fig. 13.

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SECTIONAL TIERED VAULT STRUCTURE

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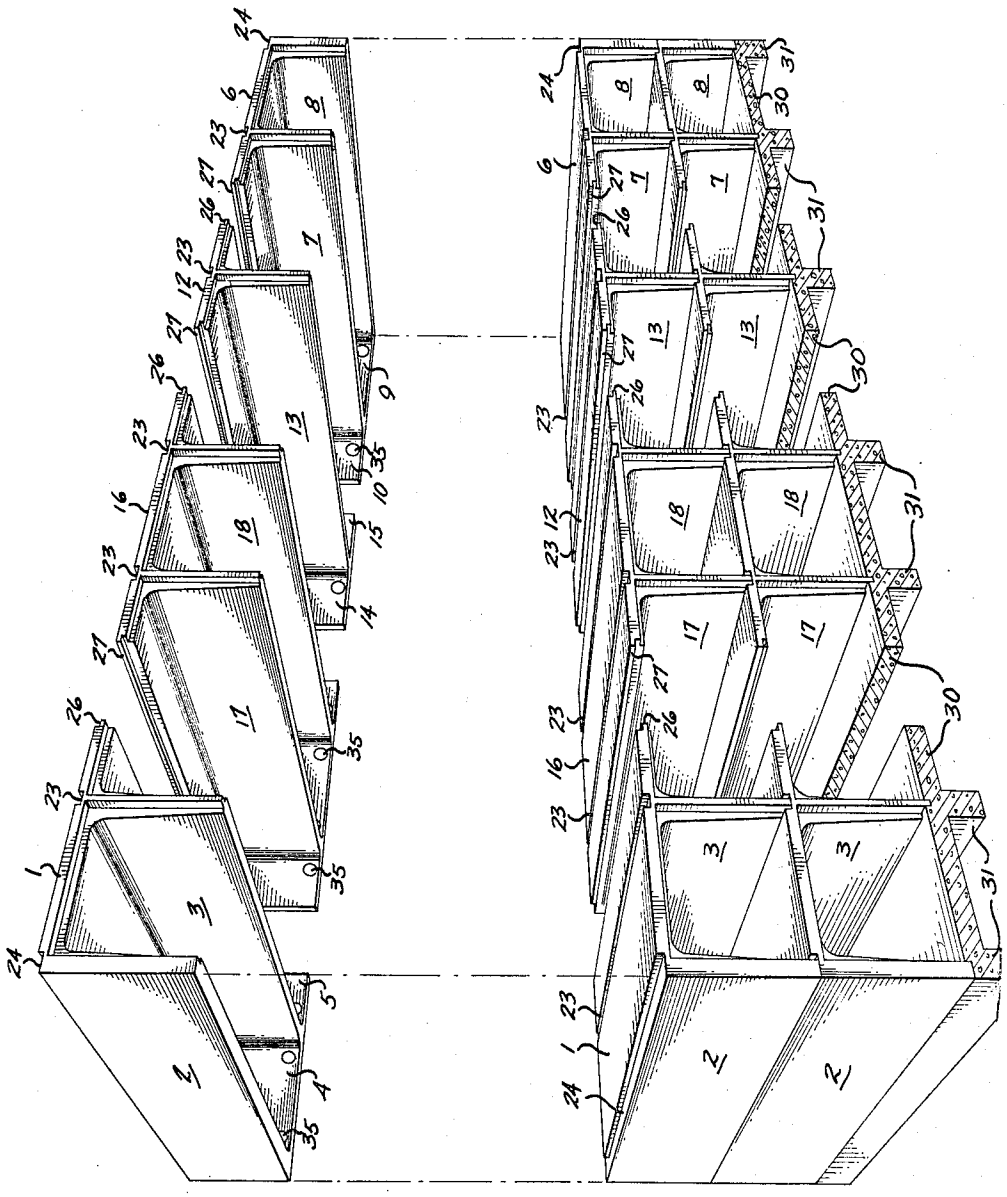

Fig. 14.

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SECTIONAL TIERED VAULT STRUCTURE

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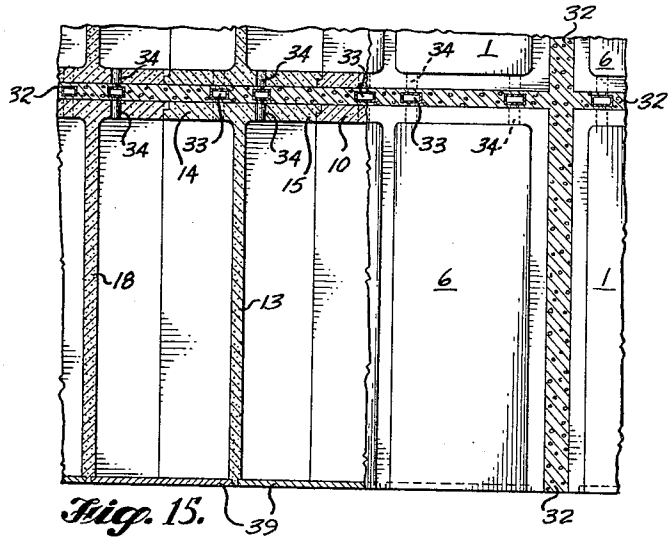


Fig. 15.

Fig. 17.

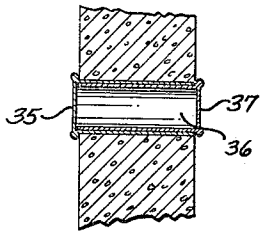


Fig. 16.

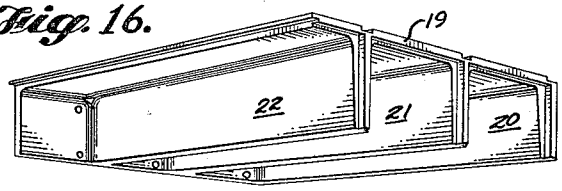


Fig. 18.

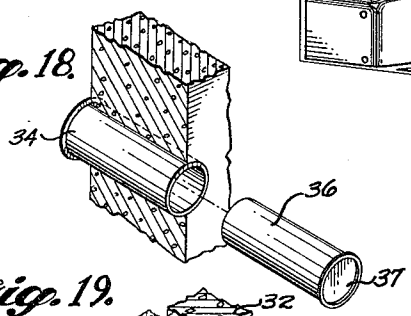


Fig. 19.

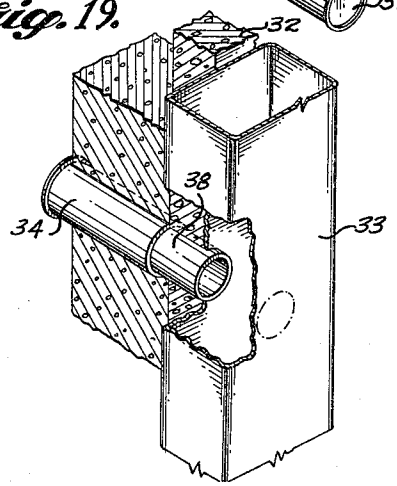
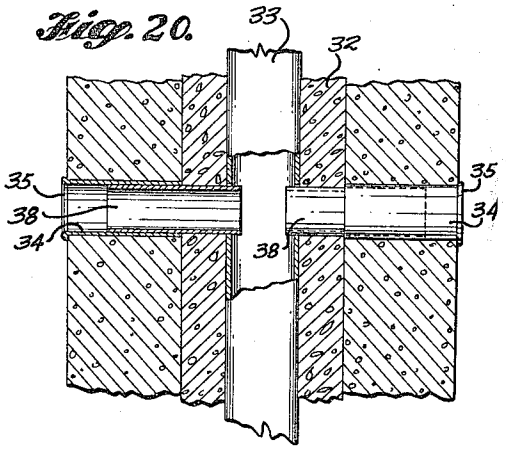


Fig. 20.



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United States Patent Office

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SECTIONAL TIERED VAULT STRUCTURE

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Filed Nov. 5, 1962, Ser. No. 235,289
2 Claims. (Cl. 52—136)

This invention relates to a tiered vault or crypt structure for a mausoleum composed of prefabricated sections preferably made of precast concrete and the units of the several types assembled to form such a structure.

The principal object of the invention is to provide a tiered vault structure which can be manufactured by mass production techniques from prefabricated units so as to expedite greatly the construction of such structures and reduce their cost without decreasing their quality or durability. A particular object is to provide units of a few types which can be assembled in various combinations to produce tiered vault structures having different numbers of tiers, and which tiers can include any desired number of vaults or crypts.

Another object is to provide units of such a sectional tiered vault structure which are of a size and shape that can be cast and handled easily, and from which the forms can be removed readily. Such a unit is of open character, the elements of which are designed to have adequate strength while being light.

A further object is to provide different types of precast units for a sectional tiered vault structure which can be handled conveniently by mechanical handling devices, such as a forklift truck, and which are of stable shapes so that they can be set on the ground or stacked in virtually any position and are sufficiently stable so that they will not tip over easily and can be stacked readily for storage or for assembly.

Another object is to provide units of a sectional tiered vault structure which can be assembled easily and quickly, and which when thus assembled will be located accurately relative to each other and will be interlocked to maintain their desired relationship. When thus assembled the units can be secured permanently in place, and it will not be readily apparent that the structure has been fabricated from precast units assembled together.

The foregoing object can be accomplished by utilizing a few different types of units such as two to five types which can be assembled in different ways to produce a tiered vault structure having the desired number of vaults in each tier. Each unit is of open construction including an element of a horizontal wall, preferably a roof element with one or more upright wall elements projecting from one side thereof to form open cavities closed by engagement of the free edge of each upright wall element with the side of a roof element of another unit remote from the upright wall elements of such other unit. Cavities are defined by the divider wall element or upright elements at one side of the horizontal wall element, at least one of such cavities being of angle shape and the other cavity or cavities being of angle shape or U-shape. A U-shaped cavity will be formed between two upright wall elements projecting in parallel relationship from the horizontal wall element. One end of each of such cavities is closed by an end web, and the opposite end of each such cavity is open. The various units are assembled so that edges of adjacent units interfit in each tier to provide successive channel-shaped cavities and each tier is assembled with an adjacent tier so that the open sides of such cavities are closed by the horizontal wall elements of an adjacent

tier to form vaults of rectangular shape, closed at one end permanently, and the other end of which is open and can be closed by the usual closure panels.

FIGURE 1 is a side elevation of one type of tier end unit, FIGURE 2 is an end elevation of such unit, and FIGURE 3 is a bottom plan of such unit.

FIGURE 4 is a side elevation of one type of intermediate tier unit, FIGURE 5 is an end elevation of such unit, and FIGURE 6 is a bottom plan of such unit.

FIGURE 7 is a side elevation of a different type of intermediate tier unit, FIGURE 8 is an end elevation of such unit, and FIGURE 9 is a bottom plan of that unit.

FIGURE 10 is a side elevation of a different type of tier end unit.

FIGURE 11 is an end elevation of the same unit, and FIGURE 12 is a bottom plan of the unit.

FIGURE 13 is an end elevation of a plurality of different types of units assembled with the upright wall elements in interleaved relationship, suitable for storing or shipping the units.

FIGURE 14 is an exploded perspective of various types of tiered vault structure units shown in the general arrangement suitable for construction of a representative type of tiered vault structure.

FIGURE 15 is a plan of an assembled sectional tiered vault structure with parts broken away.

FIGURE 16 is a bottom perspective of an alternative type of tiered vault structure unit.

FIGURE 17 is a fragmentary vertical section through a vent or drainage port structure, FIGURE 18 is a fragmentary perspective through a portion of a tiered vault structure unit showing details of an aperture-forming tube; FIGURE 19 is a top perspective of a fragmentary portion of a tiered vault structure unit and related structure, including aperture-forming elements; and FIGURE 20 is a fragmentary vertical section through adjacent portions of tier vault structure units showing duct structure.

It has been the practice heretofore to construct a tiered vault structure in a mausoleum from concrete by pouring the vaults in place, usually one tier at a time. It was therefore necessary to allow the concrete in one tier to set to a reasonably hard condition before the next tier could be poured. Consequently, the construction of such a tiered vault structure required a long time to complete, which added greatly to the cost of the structure. By producing such a structure by the procedure of assembling precast units constituting components of such structure it may be completed much sooner, yet the finished structure will be superior to a poured-in-place structure because of the uniformity of the various components and the ability to provide a superior finish on the individual units, which are produced under more carefully controlled conditions in a concrete product manufacturing plant instead of at the site of the vault structure.

In order to facilitate production of the individual units to be assembled to form the tiered vault structure an important feature of the present invention is that each of the units is of open construction so that all of the surfaces of each unit are readily accessible for inspection and any finishing operation on them which may be desired. Units of the type used are shown in FIGURES 1 to 12 inclusive and 16. Common characteristics of these units are that each includes an element of a horizontal wall, such as a roof element, from which projects perpendicularly to such horizontal wall element one or more upright wall elements which form U-shaped channel cavities with the horizontal wall element. These units are of two

principal types, one type forming an end vault of a tier and the other unit forming parts of vaults between the ends of a tier. End units are shown in FIGURES 1 to 3, 10 to 12 and 16, and intermediate units are shown in FIGURES 4 to 6 and 7 to 9. By proper assembly of these units a tier having any number of individual vaults can be constructed and such tiers can be superimposed to any desired height.

The end unit shown in FIGURES 1 to 3 is intended to be used to form the left end of a tier of vaults, as shown in FIGURE 14, although it would be possible to use such a unit to construct the right end of a tier of vaults if it were inverted. This unit includes an element **1** of a horizontal wall which preferably is the roof element of approximately one and one-half vaults. As shown in FIGURES 1 and 2, such roof element extends the full depth of the tier from front to rear, which may be seven to eight feet. The cross-sectional shape of each vault transversely of its depth is preferably rectangular, being approximately three feet wide and from two to two and a half feet high. The height of the vault in each instance is established principally by the height of the upright wall elements **2** and **3** projecting in parallel relationship perpendicularly from the roof or horizontal wall element **1**. The width of each vault is determined by the spacing of such upright wall elements. Since the unit shown in FIGURES 1, 2 and 3 is a tier end unit, the wall **2** is a tier end wall and only the wall **3** is a divider wall. This wall is spaced from the wall element **2** approximately two-thirds of the length of the room element, which, as stated above, constitutes the roof section for approximately one and one-half vaults.

One end of the U-shaped channel cavity formed by the wall elements **2** and **3** and the portion of the horizontal wall element **1** bridging between them is closed by an end wall element **4**. A second end wall element **5** disposed coplanar with the end wall element **4** closes the corresponding end of the angle-section cavity formed by the divider wall **5** and the portion of the horizontal wall element **1** projecting oppositely from that portion bridging between the upright wall elements **2** and **3**. It is evident that this tier end unit is open at the lower side as shown in FIGURES 1 and 2 and at the near end of FIGURE 2 and the right end of FIGURES 1 and 3. When such a unit is precast from concrete in a mold, the mold portion forming the cavities can be withdrawn readily from the open side in a direction parallel to the end wall elements **4** and **5**. The divider wall element can be tapered to a considerable degree from the horizontal wall slab toward the free edge of such divider wall element, and the side of the end wall element **2** facing the divider wall **3** can be inclined correspondingly to provide ample draft to facilitate the removal of the forms.

The characteristics of the right tier end element shown in FIGURES 10, 11 and 12 are similar to those discussed in connection with the left tier end element of FIGURES 1, 2 and 3. In this instance the horizontal wall element **6** also is shown as being a roof element from which project downward a divider wall element **7** and a right end wall element **8**. The end wall element **9** closes one end of the channel cavity formed by the wall elements **7** and **8**, and the roof element **6**, and the end wall **10** closes the corresponding end of the angle-shaped cavity formed by the divider wall element **7** and the portion of the roof element **6** at the side of such divider wall element remote from the end wall element **8**. Like the left tier end unit of FIGURES 1, 2 and 3, the right tier end unit also is open at the side opposite the horizontal wall element **6** and at the end opposite the end wall elements **9** and **10**, and the divider wall **7** is tapered in thickness toward its free edge and the inner side of the end wall **8** is inclined to provide adequate draft so that the form used in precasting such a unit can be withdrawn easily from the completed unit in a direction parallel to the end wall elements and parallel to the tier end wall element **8** and divider wall element **7**.

The smallest intermediate tier unit is shown in FIGURES 7, 8 and 9 as including a horizontal wall element **12** which is of an extent lengthwise of the tier equal to only approximately one vault width. This unit does not have two divider walls, however, but only a single divider wall element **13** projecting from the central portion of the horizontal wall element **12** so as to form at its opposite sides with the horizontal wall element **12** similar angle-shaped cavities opening in opposite horizontal directions. The corresponding ends of such angle-shaped cavities are closed by end wall elements **14** and **15**, respectively, the opposite ends of such cavities being open. Like the divider wall elements **3** and **7** described previously, the divider wall element **13** tapers toward its free edge from the horizontal wall element **12** so as to afford adequate draft to enable the mold form to be removed easily in a direction parallel to the divider wall element **13** and the end wall elements **14** and **15**.

The intermediate tier unit shown in FIGURES 4, 5 and 6 is of an extent lengthwise of the tier twice as great as the unit shown in FIGURES 7, 8 and 9, so that its horizontal wall element **16** is of an extent lengthwise of the tier twice as great as the corresponding extent of the horizontal wall element **12** of the unit shown in FIGURES 7, 8 and 9. From this horizontal wall element two divider wall elements **17** and **18** project in the same direction spaced apart a distance corresponding to the width of a vault. The end portions of the horizontal wall element **16** project oppositely beyond the divider element walls **17** and **18** a distance equal to approximately one-half of the width of a vault. Like the divider wall elements described previously the elements **17** and **18** have a substantial taper toward their free edges from the horizontal wall element **16**.

It would, of course, be possible to construct a tiered vault structure only from tier end elements of the type shown in FIGURES 1, 2 and 3 and in FIGURES 10, 11 and 12, but such a tiered vault construction would have tiers having only three vaults in each tier. If an intermediate unit of the type shown in FIGURES 7, 8 and 9 were placed between the tier end units, each tier would have in it four vaults. If the intermediate tier unit shown in FIGURES 4, 5 and 6 were placed between the tier end units of FIGURES 1, 2 and 3 and FIGURES 10, 11 and 12, each tier would have in it five vaults. Alternatively, two intermediate elements of the type shown in FIGURES 7, 8 and 9 could replace the single intermediate element of FIGURES 4, 5 and 6 to form tiers each having five vaults. If a tier having six vaults were desired one intermediate unit of the type shown in FIGURES 4, 5 and 6 and one intermediate unit of the type shown in FIGURES 7, 8 and 9, or three intermediate units of the type shown in FIGURES 7, 8 and 9 could be placed between two end units of the type of FIGURES 1, 2 and 3 and of FIGURES 10, 11 and 12.

If a tier having seven vaults in it were desired, two of the intermediate units of FIGURES 4, 5 and 6 could be located between the end units of FIGURES 1, 2 and 3 and FIGURES 10, 11 and 12, or one of such units and two of the intermediate units shown in FIGURES 7, 8 and 9 could be used, or four of the intermediate units shown in FIGURES 7, 8 and 9 could be combined with the two tier end units. Thus by combining the tier end units of FIGURES 1, 2 and 3 and of FIGURES 10, 11 and 12 alone, or with one or more intermediate units such as shown in FIGURES 7, 8 and 9 and in FIGURES 4, 5 and 6 tiers having any number of vaults from three up can be constructed, and the intermediate units can be used in various combinations as suggested above.

To expedite assembly of the units it may be desirable to use larger units. Such a representative unit is shown in FIGURE 16 as being of an extent lengthwise of a tier of approximately two and one-half vaults. Thus the horizontal wall element **19** is of an extent lengthwise of the tier equal to the width of two and one-half vaults, so

that one tier end wall element **20** and two divider wall elements **21** and **22** project from the horizontal wall element in parallel relationship. If the horizontal wall element **19** is a roof element, the unit would be a right tier end unit and would be equivalent to the combination of one of the right tier end units shown in FIGURES 10, 11 and 12, and one of the intermediate units of FIGURES 7, 8 and 9. Correspondingly, an intermediate unit of the type shown in FIGURES 4, 5 and 6 could be provided except that the extent of the unit lengthwise of the tier would be equal to the width of three vaults and three divider walls projecting from the horizontal wall unit would be provided. Even larger units could be constructed, but it would be difficult to handle them both during manufacture and during assembly, so that probably units larger than those illustrated in the drawings would not be used. In any case, however, each of such units would have a horizontal wall element projecting from one edge a distance equal to approximately one-half of the width of a vault in the case of a tier end unit and in intermediate units two horizontal wall element portions would project from opposite edges a distance equal to approximately one-half of the width of a vault.

Despite the open side and end construction of the various units described they are quite strong and can be handled and placed on a horizontal surface on any side with little risk of toppling over. It is obvious that if the units were placed with the flat side of the horizontal wall element down and the divider walls projecting up when supported on a flat surface, as shown in FIGURE 13, that the units could not possibly tip over. Moreover, if the end units were supported on a flat surface on their side walls, the units would be quite stable. Even the end wall of such a unit affords a base of sufficient extent so that it would be difficult to tip over a unit standing on its closed end.

If the units were supported with their open sides downward on the free edges of their tier end and divider walls either on a flat surface or with the upright walls of the units interleaved, as shown in FIGURE 13, the units would be supported stably and adequately because the upright wall elements are tapered from their roots, as shown in FIGURES 2, 5, 8 and 11, and the roots of the upright wall elements are further strengthened by having fillets at the reentrant corners of the cavities. Also, the upright wall elements are further strengthened by the end wall elements integrating one end of each upright wall element with an adjacent end of a horizontal wall element. Even if a tier end unit or an intermediate unit were rested on its open edge on a flat surface, it would be reasonably stable because an edge of a horizontal wall element and an edge of an end wall element in coplanar relationship would be bearing on a supporting surface. If a unit were supported on its open end, the end of at least one upright wall element and the end of a horizontal wall element in coplanar relationship would be engaged to afford reasonable stability to the unit.

While, as pointed out, the units of the tiered vault structure can be supported reasonably stably when laid on any side or end, such units have much greater stability when assembled in the intended manner in a tiered vault structure, because the units are designed to enable adjacent portions of adjacent units to interfit. Thus the side of each horizontal wall element opposite the upright wall elements projecting from it have grooves **23** in registry with each divider wall element, a ledge **24** in registry with each tier end wall element, and a ledge **25** in registry with each end wall element. Such grooves and ledges are of a width to fit the corresponding free edges of the divider wall elements, tier end wall elements and unit end wall elements of the adjacent tier. Each tier is thus held against horizontal slippage relative to the next tier even under earthquake conditions. Units of two tiers thus disposed in superposed relationship are shown in the lower portion of FIGURE 14.

In addition it is desirable for the abutting edges of adjacent units in each tier to interfit, such as these adjacent edges being scarfed. In FIGURE 2 an inner flange **26** of a scarf joint is shown, which would interfit with an outer flange **27** shown at the left of FIGURES 5 and 8, for example. Similarly, an inner upright flange **28** such as shown in FIGURE 3 would interfit with an outer upright flange **29**, shown in FIGURES 6 and 9, for example. Such interfitting inner and outer flanges of complemental shape are provided on all abutting upright and horizontal edges of the units, and all of such edges are located approximately at the center of a vault. In the lower portion of FIGURE 14 the horizontal edges of the first and second tiers from the bottom intended to abut are shown in spaced relationship, and the units intended to form the third tier are shown in exploded superposed relationship. FIGURE 15 shows interfitting edges in abutment to form completed vaults.

It is preferred that the units described be assembled into a tiered vault structure with their horizontal wall elements up so as to form roof elements. The first portion of the structure starting from the bottom is composed of a continuous base slab **30**, which in FIGURE 14 is shown separated into sections for purposes of illustration, but would provide a continuous surface actually. Such a slab may be supported on downwardly extending parallel projections **31** spaced apart distances equal to vault widths so as to provide adequate bearing for the weight of the superposed tiers. The upper surface of the slab has in it grooves and ledges spaced appropriately to receive the free edges of the downwardly projecting upright divider and tier end wall elements so that the tiers cannot slide on the base.

Elements of the particular type best suited to form each tier can be selected depending upon the number of vaults to be provided in each tier. In the vault structure shown in FIGURE 14 each tier is to have six vaults, and consequently, proceeding from left to right, units of the type shown in FIGURES 2, 5, 8 and 11 have been selected. These tiers could instead have included the types of FIGURES 2, 8, 5 and 11 in order, or could have used a unit of the FIGURE 2 type, a unit of the FIGURE 11 type and three intermediate units of the FIGURE 8 type. In each instance the abutting edges of the adjacent units would form scarf joints illustrated as being of the shiplap type. Also for vault structures having multiple tiers adjacent tiers could be formed from units of different types, one including intermediate units from left to right of the FIGURE 5 type and then the FIGURE 8 type, and the next tier having units from left to right, first of the FIGURE 8 type and then of the FIGURE 5 type. Alternatively, a unit of the type shown in FIGURE 16 could replace a unit of the FIGURE 8 type plus a unit of the FIGURE 11 type. In each case, however, the joints between abutting edges in both the horizontal walls and in the upright walls of the structure would be located substantially centrally of the widths of the vaults or at least between upright adjacent wall elements so that the sides of the individual vaults would be open prior to assembly of the units into the tiered vault structures. With scarfed joints of the shiplap type, as shown in FIGURE 14, the units in each tier would be assembled from left to right, so that the last unit at the right end of the tier, shown in FIGURES 10, 11 and 12, could be slid into place without the necessity of tilting such last unit or any other unit in the tier. While the movement of the joint edges in the horizontal wall elements during such assembly operation is transversely of the length of the abutting edges, the elements of the upright joints would be moved relatively lengthwise of such joints.

After all of the tiers have been assembled in one set, adjacent sets of tiers can be assembled, as shown in FIGURE 15, and the adjacent tier assemblies can be integrated by separating concrete walls **32** poured in place in narrow spaces left between the adjacent assemblies. In such sep-

arating walls upright stacks 33 can be located to provide vent and drainage passages for the vaults. Each vault must be ventilated for dissipation of stale odors, and a drain must be provided for each vault for removal of condensation. The stacks 33 can be located to serve the vaults on opposite sides of a separating wall 32. Such vents and drains can be connected to each vault through its end wall adjacent to such a separating wall.

Each vault structure unit at the time it is cast can have formed in its end wall apertures adapted for later connection to a ventilation or drain stack. Such apertures can be formed generally in the four corners of each end wall element by embedding in such element a telescoping tube device such as shown in FIGURES 17 and 18. The telescoping tube may include an outer tube 34 having a closed end 35 at the inner side of the end wall element. Within this outer tube slidably fits an inner tube 36 having a closed end 37 at the outer side of the end wall element. When these two tubes are in their most contracted relationship shown in FIGURE 17, they will be of a length substantially equal to the thickness of the end wall element. Preferably each tube has a flange between its cylindrical wall and its end wall so as to limit movement of the outer tube toward the vault end wall element and movement of the inner tube into the outer tube.

After the telescoping tube has been cast in place in the vault end wall, as shown in FIGURE 17, and the forms removed from the end wall element, the inner tube 36 can be withdrawn from the outer tube 34, as shown in FIGURE 18, by prying outwardly on the inner tube end flange. The aperture through the wall will still be closed, however, by the tube end wall 35. After the tiered vault structure has been assembled at one side of a space in which a separating wall 32 is to be poured, the stacks 33 can be put in place and longer inner tubes 38 can be inserted within the outer tubes 34 and extended into the stack 33. Because one of these stacks opposite the end of each vault will be a vent and the other stack will be a drain, only one of the holes at each side of each vault will be thus connected to a stack.

As shown in FIGURE 15, the upper hole at one side of the vault is connected to a vent stack, and the lower hole at the other side of the vault is connected to a drain stack. The outer tubes 34 in the other two holes can remain plugged by the inner tube 36 closed by its end wall 37. While the stacks 33 can be installed after the vault structure at one side of the separating wall space has been assembled completely, it will be necessary to make the connections from the vaults at the other side of the separating wall space progressively as the vault units are put into place to enable the interconnecting tubes 38 to be manipulated into a position connecting to the proper stack. When all of the tube-to-stack connections have been made, as shown in FIGURES 15 and 20, the separating walls 32 can be poured to secure the assembled units in place. If the tubes 34 not connected to stacks are still closed by the inner tubes 36, the separating wall will seal the end of such tubes over the closed tube end 37, or if the inner tube 36 has been removed the outer tube 34 will be filled with concrete flowing into it from the separating wall 4. The passage through the end wall elements will thus be preserved only where the outer tubes 34 are connected to the stacks 33 by the inner connecting tubes 38.

Even though after the separating walls 32 have been poured, an upper and a lower outer tube 34 will be connected to a stack 33 in the end wall element of each vault, the passages through all of such tubes will still be sealed by the outer tube end wall 35 after the vault installation has been completed. Provision of this end wall will prevent impure air flowing into the cavity until it is to be used. It is not necessary for a vault to be connected to a vent stack and a drain stack until the vault is placed in use for burial purposes. At that time it is merely necessary to remove the outer tube end wall 35 of each tube connected to a stack 33 to provide a passage from the vault to such stack. The tubes 34 and 36 and the tube ends 35 and 37 may be made of cardboard or light metal or plastic, or any combination of such materials. In any case the end wall 35 can be constructed so that it can be readily cut out or broken up.

After a vault has been placed into use for burial purposes its outer end will be closed and sealed. The open end of each vault is rabbeted, as shown in FIGURE 14, for example, to receive closure panels 39 suitably sealed in place in conventional fashion. To provide complete separation of each vault from an adjacent vault suitable sealing compound, such as mastic or resin, can be placed between the edge of each wall element and an abutting element, as the vault structure is assembled, to provide airtight joints between such abutting elements. The grooves 23 and ledges 24 assist in confining the sealant or calking material at the ends of the upright wall elements, and the angle of the shiplap joint in each instance serves to hold such material.

After the tiered vault structures have been assembled and the separating walls 32 between adjacent such structures poured, the entire vault assembly constitutes an integrated whole, which is as durable and resistant to disruption by an earthquake shock as a corresponding structure which has been poured in place, even though there is no connection of reinforcing between the various component units. The wall of each unit will, however, have embedded in it large opening reinforcing mesh to provide adequate strength for each element of a prefabricated unit. Such strength is particularly important to enable the units to be handled quickly and without the exercise of exceptional care. Thus each unit can be lifted into place by a fork-lift truck to reduce manual labor. Because the free edges of the upright walls are hidden, it is immaterial if they are rough or somewhat chipped during handling, and, in fact, such roughness or chipping would actually improve the bond to the sealant or calking material.

I claim as my invention:

1. A sectional tiered vault structure comprising a plurality of superposed tiers of vaults, each tier including a plurality of preformed units two adjacent units of which have horizontal wall elements with portions thereof projecting toward each other in coplanar edge-abutting relationship and cooperatively forming a horizontal wall of a first cavity in such tier and each of said horizontal wall elements having another portion forming at least a portion of a horizontal wall of a second cavity in the same tier, said adjacent units further having upright wall elements with portions projecting toward each other, disposed in coplanar edge-abutting relationship and cooperatively forming an upright wall of said first cavity in such tier, and said adjacent units further having upright walls disposed perpendicular to said edge-abutting upright wall elements, spaced from the abutting edges of said horizontal wall element portions and of said upright wall element portions and spaced apart and forming opposite sides of said first cavity, and horizontal wall means abutting the edges of said upright walls opposite said horizontal wall elements and closing the opposite horizontal side of said first cavity.

2. A sectional tiered vault structure comprising a plurality of superposed tiers of vaults, each tier including a plurality of preformed units two adjacent units of which have horizontal wall elements with portions thereof projecting toward each other in coplanar edge-abutting relationship and cooperatively forming the upper horizontal wall of a first cavity in such tier, each of said horizontal wall elements having another portion forming at least a portion of a horizontal wall of a second cavity in the same tier and each of said horizontal wall elements forming the lower horizontal wall of at least a portion of a cavity in the next higher adjacent tier, said adjacent units further having upright end wall elements with portions projecting toward each other, disposed in coplanar edge-abutting relationship and cooperatively forming an upright end wall of said first cavity in such tier, and said adjacent units further having upright walls disposed perpendicular to

said edge-abutting upright end wall elements, spaced from the abutting edges of said horizontal wall element portions and of said upright end wall element portions and spaced apart and forming opposite sides of said first cavity, and horizontal wall means abutting the lower edges of said upright walls and closing the bottom of said first cavity.

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