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[54] **MULTI-STORY BUILDING STRUCTURE**

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[52] **U.S. Cl.** **52/236,** 52/220
[51] **Int. Cl.** **E04h 1/04**
[58] **Field of Search** 52/79, 236, 220

[56] **References Cited**

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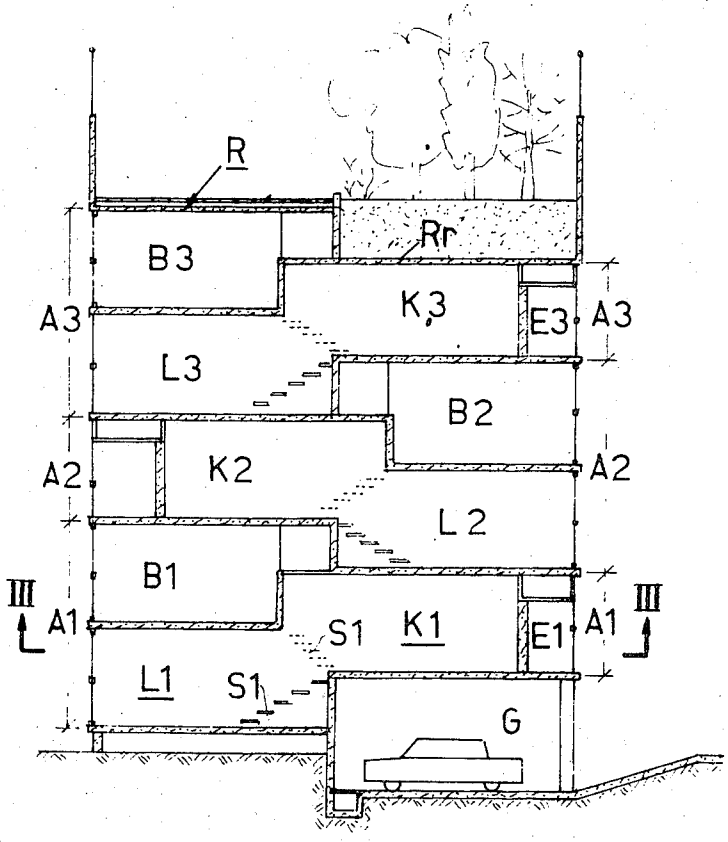
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[57] **ABSTRACT**

A multi-story building structure comprises a plurality of apartment units some or all of which include rooms on the entrance level of the respective unit, on a level lower than the entrance level, and on a level higher than the entrance level. In each such apartment unit, the higher level overlies the lower level, and the entrance level is horizontally laterally of, and vertically spaced between, the lower and higher levels. The entrance level of each unit overlies the higher level of the next lower unit. One or more walls of the building structure are shear walls, the corridor openings of which are horizontally staggered at successive stories. Part of the higher and lower levels of each apartment unit are joined together to provide a double-story room suitable for landscaping, gardening, etc.

6 Claims, 7 Drawing Figures



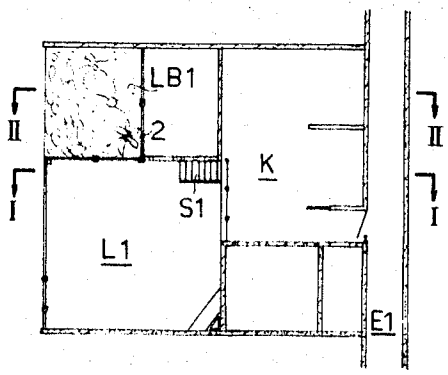


FIG.3

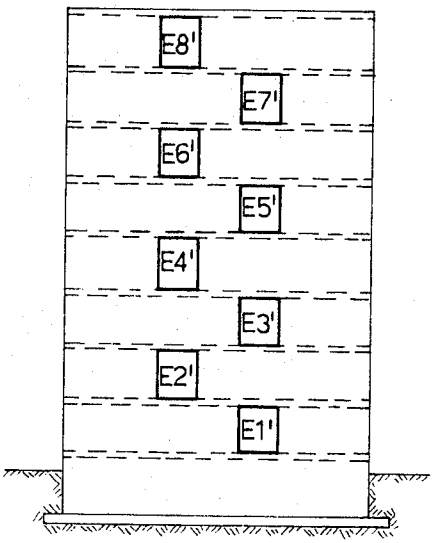


FIG.7

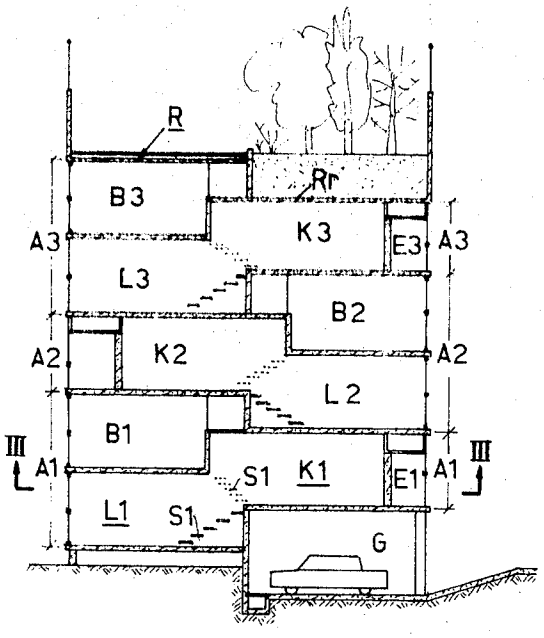


FIG.1

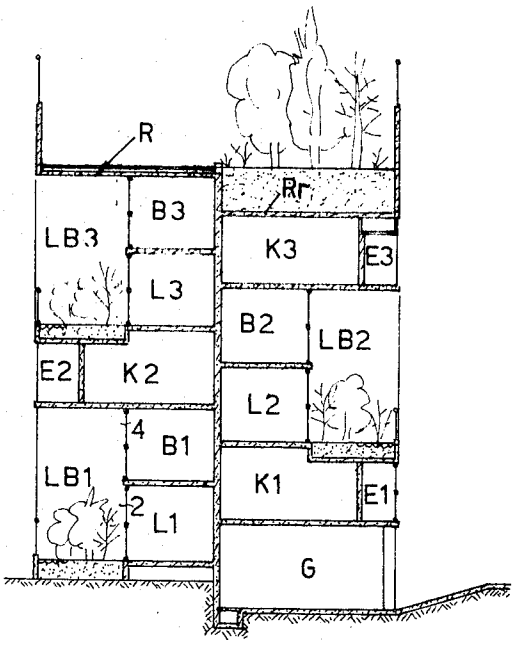


FIG.2

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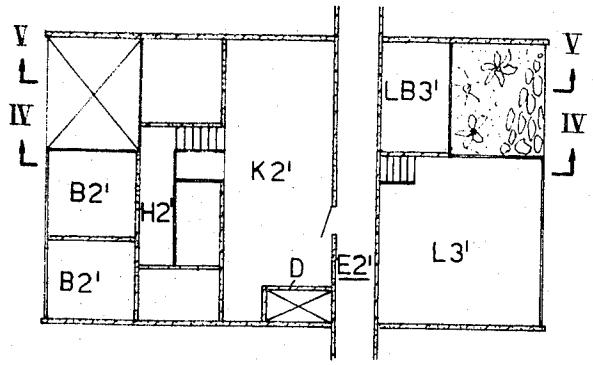


FIG. 6

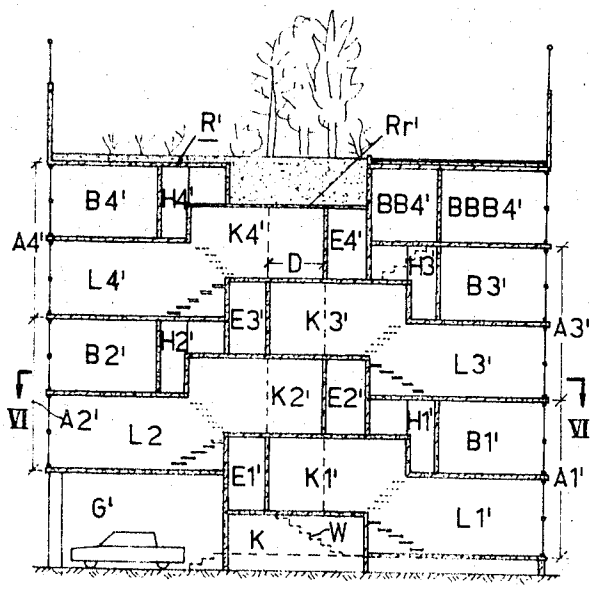


FIG. 4

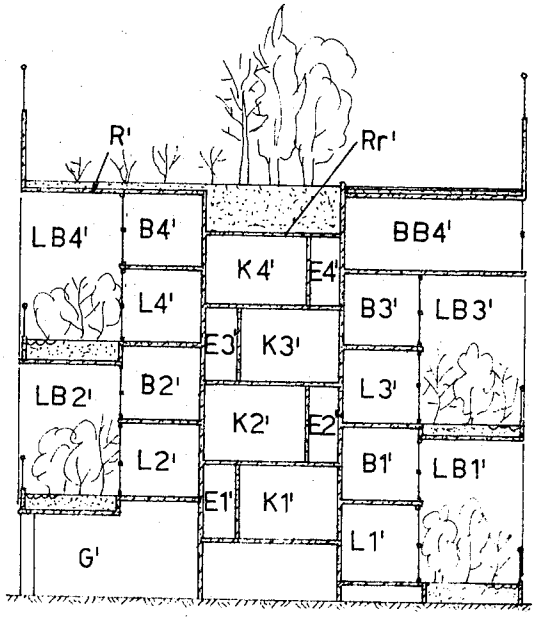


FIG. 5

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MULTI-STORY BUILDING STRUCTURE

BACKGROUND OF THE INVENTION

The present invention relates to multi-story structures, and particularly to such structures having a plurality of apartment units each including a plurality of rooms.

Individual houses or villas have a number of advantages over multi-apartment buildings. Among the more important advantages are a greater degree of privacy and the possibility of providing landscaping and gardens. Individual housing units, however, require considerably more land than multi-apartment buildings, and with the ever-increasing scarcity in land suitable for residential use as well as the rise in prices of such land, there is a tendency to shift from individual housing units to multi-apartment buildings.

SUMMARY OF THE PRESENT INVENTION

The present invention provides a housing structure which is basically a multi-apartment building, but which has many of the advantages of individual houses.

According to the invention, there is provided a multi-story building structure of rectangular shape having a plurality of apartment units each apartment unit consisting of three levels, including rooms on the level of the entrance to the respective unit, on a level lower than the entrance level, and on a level higher than the entrance level. The higher level of each unit overlies the lower level of the respective unit; and the entrance level of the unit is horizontally laterally of, and vertically spaced between, the lower and higher levels of the respective unit. In addition, the entrance level of each apartment unit being bounded by the higher level of the immediately adjacent lower apartment unit, and by the lower level of the immediately adjacent higher apartment unit. The entrance level of each apartment unit is thereby substantially isolated from the rest of the apartment, particularly from the rooms of the remaining two levels of the respective apartment.

Preferably, at least part of the higher and lower levels of the apartment units are joined together to provide a double-story room, which would be suitable for landscaping, cultivating a garden, or the like.

According to another feature of the invention, at least one of the walls of the building structure is a shear wall the corridor openings of which are horizontally staggered at successive vertical locations.

Further features and advantages of the invention will be apparent from the description below.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, somewhat diagrammatically and by way of example only, with reference to the accompany drawings, wherein:

FIGS. 1–3 illustrate one form of building structure constructed in accordance with the invention, FIGS. 1 and 2 being vertical sectional views along lines I — I and II — II, respectively, of FIG. 3; and FIG. 3 being a horizontal sectional view along line III — III of FIG. 1;

FIGS. 4–6 illustrate a second form of building structure constructed in accordance with the invention, FIGS. 4 and 5 being vertical sectional views along lines IV — IV and V — V of FIG. 6; and FIG. 6 being a horizontal section along lines VI — VI of FIG. 4; and

FIG. 7 diagrammatically indicates how at least one of the walls of the building structure of FIGS. 4 – 6 serves as a shear wall having corridor openings which are horizontally staggered at successive stories.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

The embodiment of the invention illustrated in FIGS. 1–3 is a multi-story building structure in which three apartment units are shown, namely units A1, A2 and A3. All three units are of the same layout except that they are oriented in opposite directions. That is to say, the entrance (E1) of the lower-most unit A1 faces one side of the building (right side in FIG. 1), the entrance (E2) of the second unit A2 faces the opposite side (left side of FIG. 1), and the entrance (E3) of the uppermost unit faces the same side as the entrance E1 of unit A1.

For the sake of simplicity, only three units have been illustrated in the building structure of FIGS. 1–3, but it will be appreciated that, in most cases, there would be a plurality of apartment units in each of the stories occupied by units A1, A2 and A3. In such a case, the entrances E1, E2 and E3 would actually be entrance corridors serving the apartment units in the respective story. Also, there would be many more stories of apartment units than illustrated in FIGS. 1–3. Thus, the illustrations in FIGS. 1–3, as well as those in FIGS. 4–7 to be described below, are merely simple diagrammatic drawings to illustrate the basic principles of the invention, it being appreciated that the apartment units shown may be repeated both in the length of the building as well as in its height.

Each apartment unit includes rooms on three levels. For example, referring to apartment unit A1, the rooms of this apartment include an entrance corridor or hall E1 and a kitchen K1 on the entrance level, a living room L1 on the lower level, and a bedroom B1 on the higher level. There of course would be more than one room on each level in most cases. The rooms (B1) on the higher level are directly overhead those (L1) of the lower level. The rooms (K1) on the entrance level are laterally of, and vertically spaced between, the rooms (L1, B1) of the lower and higher levels, and are joined to such rooms by stairs S1 and S1', respectively.

It will be seen that the next higher apartment unit A2 is oriented so that the rooms (E2, K2) of the entrance level unit A2 overlie the higher level rooms (B1) of the lower unit A1; and the rooms (L2) of the lower level of unit A2 overlie the rooms (E1, K1) at the entrance level of the lower unit A1. Similarly, in the topmost apartment unit A3, the rooms on the entrance level (E3, K3) overlie the rooms (B2) on the higher level of unit A2; and the rooms (L3) on the lower level of unit A3 overlie the rooms (E2, K2) on the entrance level of unit A2.

The building roof R includes a recessed portion R' overlying the rooms (E2, K3) at the entrance level of the topmost unit A3. Further, the building includes a garage G (e.g. for use by all the occupants of the building) which garage underlies the rooms (E1, K1) on the entrance level of the lowermost unit A1.

A part of the lower and upper levels (rooms L1, B1) of each apartment unit is preferably joined together by omitting the floor-ceiling partition between them to form a two-story room (e.g., LB1, FIGS. 2 and 3) which is suitable for landscaping or gardening. The double-story room LB1 is on the outside of the building

to receive the maximum exposure to the sun; and the rooms (L1, B1) on the lower and higher levels, respectively, are closed off from the double-story room LB1 by glass doors 2, 4 to provide maximum light to these rooms.

The foregoing arrangement provides a number of advantages over apartment buildings of more conventional construction. First, each apartment unit has three different levels so as to provide the advantage of better isolation and privacy of certain rooms of the apartment with respect to other rooms (e.g. the bedrooms with respect to the living room), which is one of the characteristic advantages of separate houses over the standard apartments. In addition, it permits part of the upper and lower levels to be joined together as a single double-story room suitable for landscaping, cultivating gardens, or the like, another characteristic advantage of separate houses over the standard apartments. Also, the arrangement provides more natural light and ventilation to the rooms, by the glass doors 2 and 3 in the rooms L1 and B1 respectively. Further, the arrangement is such that it is only necessary to ascent one-half floor, or to descend one-half floor, to go from the entrance level to either of the other two levels of the apartment. Additional advantages include the provision of a convenient space for the garage at the street level of the apartment, and also a recessed roof (Rr) suitable for roof-top landscaping, gardening, swimming pool, play area or the like.

A still further advantage of such a construction is that it enables the building to have a shear wall in which the corridor openings are horizontally staggered at successive vertical stories or locations. This will be described more fully below with respect to FIG. 7 as applied particularly to the embodiment of the invention illustrated in FIGS. 4–7.

The embodiment of the invention illustrated in FIGS. 4–6 is a multi-story building structure in which four apartment units are shown, namely units A1′, A2′, A3′ and A4′. As in the embodiment of FIGS. 1–3, all four units are generally of the same layout except that they are oriented in opposite directions. However, in this embodiment, as distinguished from the embodiment of FIGS. 1–3, the entrance corridors are located interiorly of the building in the vicinity of its vertical center line. Thus, the lowermost unit A1′ includes an entrance corridor or hall E1′ and a kitchen K1′ on the entrance level, a living room L1′ on the lower level, and a bedroom B1′ on the upper level, there being a hall H1 (or an extra bedroom) adjacent to bedroom B1′. Units A2′ and A3′ are similarly constructed, the entrance corridors to each being staggered on opposite sides of the building center line. The topmost apartment unit A4′ is also similarly constructed, except that it includes two additional bedrooms BB4′ and BBB4′.

At the street level, the building includes a main entrance hall K leading to a common garage G′ and also to the common stairways W. The roof R′ of the building may be provided with landscaping, and the center part Rr′ of the roof is recessed one-half story, making it particularly suitable for large-sized landscaping, a swimming pool, children's playground, or the like.

In the building structure of FIGS. 4–6, the vertical center line of the building is preferably occupied by a vertical facilities duct D′ (see unit A4′, FIG. 4), the entrance corridors E1′, E2′, E3′, E4′ being staggered on opposite sides of the facilities duct D′.

As in the embodiment of FIGS. 1–3, a part of the lower and upper levels (e.g. rooms L1′, B1′) of each apartment unit is preferably joined together, by omitting the floor-ceiling partition between them to form a two-story room (e.g. LB1′, FIG. 5) which is suitable for landscaping or gardening. This double-story room also faces the outside of the building so as to receive maximum exposure to the sun, and preferably is closed-off from the remaining rooms on the lower and higher levels by glass doors 2′, 4′, to provide maximum light to these rooms.

The advantages discussed above with respect to the embodiment of FIGS. 1–3 also apply with respect to the embodiment of FIGS. 4–6.

In addition, FIG. 7 illustrates how one or more walls of the building structure in FIGS. 3–6 may be used as a shear wall having improved characterists over the shear walls in conventional constructions. As known, shear walls are conventionally used in multi-story buildings as an economic means of providing the required lateral stability against wind or earthquake loading. However, the full efficiency of such walls is seldom achieved since they are frequently perforated by a series of regular openings for corridors, doorways and windows. By the building structure of the present invention, the openings for the corridors (El′ – E8′) are horizontally staggered on opposite sides of the building vertical center line CL at successive vertical stories or locations of the buildings, thereby increasing the lateral stability provided by the shear wall, as well as minimizing the amount of reinforcement heretofore required in the conventional shear walls.

Many variations, modifications and other applications of the illustrated embodiment will be apparent.

What is claimed is:

1. A multi-story building structure of rectangular shape and having a plurality of apartment units; each apartment unit consisting of three levels, including rooms on the level of the entrance to the respective unit, on a level lower than said entrance level, and on a level higher than said entrance level; said higher level overlying the lower level of the respective apartment unit, and said entrance level being horizontally disposed laterally of and vertically spaced between said lower and higher levels of the respective apartment unit; said entrance level of each of said apartment units being bounded by the higher level of the immediately adjacent lower apartment unit, and by the lower level of the immediately ajdacent higher apartment unit, and thereby being substantially isolated from the higher and lower levels of the respective apartment unit.

2. A building structure as defined in claim 1, wherein in at least of one said apartment units, at least part of said higher and said lower levels are joined together to provide a double-story room.

3. A building structure as defined in claim 1, wherein the building includes a plurality of such apartment units on the same level joined by an entrance corridor, all said entrance corridors being located at the outer periphery of the building structure.

4. A building structure as defined in claim 1, wherein the building includes a plurality of such apartment units on the same level joined by an entrance corridor, all said entrance corridors being located in the vicinity of the vertical center line of the building structure.

5. A building structure as defined in claim 4, wherein a facilities duct occupies the vertical center line of the

building structure, and the entrance corridors of the units at successive levels are staggered on opposite sides of said vertical center line.

6. A building structure as defined in claim 1, wherein at least one of the walls of the building structure is a shear wall, the corridor openings of which at the entrance levels to the apartment units are horizontally staggered at successive vertical locations.

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