

Description

The invention relates to a building structure for living quarters with an upright structure and an underground structure, with a sunlight collector means positioned on top of the building for collecting the sunlight, with light conductor means for conducting the sunlight, collected by said sunlight collector means and with light radiator means for radiating the sunlight conducted by the light conductor means in a desired space within said building. Such a building is known from FR-A-674 839.

According to this known structure, the sunlight collected on the top of the building is conducted to the underground structure of the building in order to radiate the underground rooms of the building. For this purpose, the sunlight is conducted through the chimney from the top of the building to the underground rooms.

The rooms are constructed and respectively arranged so that each apartment directly faces the outside of the building, so that sunlight is allowed to enter each room in the daytime.

However, in order to construct such a building so that each apartment directly faces the outside, it is necessary to construct the building with a small diameter so that there are no rooms which do not face the outside. On the other hand, if such a building structure for living quarters is to be constructed with a small diameter, the height of such a building is limited in order to avoid high widthwise vibrations. As a consequence, with such a known building structure, the quantity of living rooms is also limited.

It is, therefore, to be regarded as the task of the present invention to provide a building structure for living quarters of the above-mentioned type having an enhanced usefulness of the whole building especially with respect to the quantity of the living quarters.

According to the invention, this task is solved therein that, in combination, said building has a substantially annular cross-section, except for the first floor and an inner cylindrical open space, which forms a courtyard, so that trees may be planted therein and that light radiator means are disposed in the cylindrical open space on the inner peripheral wall of the building.

A building structure, according to the invention, therefore, has, except for the first floor, a substantially annular cross-section that is, it has an outer surface which is exposed to the sun in the daytime and it has an inner surface which defines a cylindrical open space or yard within the middle of the building. Normally the rooms arranged with their lead edge forming the inner surface of the building, especially in the lower floors of the building, would be in the shade during the whole day and, therefore, could not be used as living rooms. According to the further feature of the characterizing clause, however, the cylindrical open space is illuminated by a light radiator means, so that even the lower rooms facing the inner building surface are illuminated by sunlight,

which is collected at the top of the building and conducted through light conductor means down to the light radiators.

As a consequence, even in the lower portions of said building, over the whole height of the cylindrical open space it is possible to arrange living rooms having their front side at said inner surface of the building. A building having a substantially annular cross-section is much less sensitive to widthwise vibrations than prior art buildings and they may, therefore, be very high. Rooms may be arranged further on both sides of the annulus all being illuminated by sunlight so that the usefulness of the building is enhanced considerably.

Further preferred embodiments of the invention are disclosed in the subclaims.

Figure 1 is a sectional elevation of a building according to the present invention;

Figures 2A and 2B are schematic sections representing other contours of buildings according to the present invention;

Figure 3 is a perspective view of a sunlight collector which forms part of the construction shown in Figure 1; and

Figure 4 is a perspective view of an assembly disposed in a dome of the sunlight collector.

Referring to Figure 1 of the drawings, a building to which the present invention is applicable is shown and generally designated by the reference numeral 10. The building 10 has a first floor A which offers a space for public use such as for stores and shops, which is accessible from any desired side of the building. The rest of the building 10 above the first floor A has an annular cross-section which defines an upwardly extending open space 12 therein. Located at the bottom of the space 12 is an artificial ground B which forms a courtyard 14 with trees planted therein, for example. The annular upper section of the building 10 has hallways C which extend along the inner edge of the annulus. An elevator shaft E extends throughout a north section of the building 10 to be accessible from the hallways C. Flower balconies D protrude from the building 10 into the open space 12 along the hallways C. Further, a basement 16 is formed below the first floor A which may serve as a gymnasium or a shelter as the case may be. The basement 16 has therein a cistern 18 which may be used as a pool or a drinking water tank when the basement 16 is used as a gymnasium or a shelter, respectively. The cistern 18 may even supply water for fire fighting. A pump P is installed in the basement 16 to supply ground water W to the cistern 18 from an underground pit 20. A sterilizing and filtering device 22 is adapted to clean the ground water which will collect itself in the cistern 18. The water W is pumped to the cistern 18 through a piping 24 which extends from the ground water pit 20.

While the building 10 has been shown and described as having a complete annular cross-section, it is not limitative but may be replaced by a substantially annular cross-section as indicated by 10' in Figure 2A or by 10'' in Figure 2B.

A frame or support 26 is fixed to the top of the

building 10 spanning the open top of the space 12. The frame 26 supports a generally spherical sunlight collector which is generally designated by the reference numeral 28. As shown in Figure 3, the sunlight collector 28 comprises a generally spherical transparent dome 30 and a generally cylindrical base 32 which supports the dome 30 thereon. Accommodated in the dome 30 of the sunlight collector 28 is an assembly for following the sun and collecting the sunlight.

As shown in Figure 4, the sunlight chasing and collecting assembly, designated by the reference numeral 34, comprises a number of lenses 36 and a single photo-detector 38 sensitive to the sunlight. The lenses 36 and sensor 38 are bundled up together by a first frame member 40 which is driven for rotation by a first motor or like drive means 42 about a horizontal axis X. The frame 40 is supported by a generally C-shaped second frame member 44 to be rotatable about the axis X. The C-shaped frame 44 is fixedly mounted on a vertical shaft 46 to be rotatable therewith about a vertical axis Z, which is perpendicular to the axis X. The shaft 46 is operatively connected to a second motor or like drive means (not shown). A control unit (not shown) controls the operation of the first and second motors in response to an output signal of the photodetector or sunlight sensor 38.

The sunlight collected by the collector 28 is utilized to illuminate various sections of the building 10. Light radiators 48 are mounted in the bottom of the base 32 of the collector 28 so as to direct the collected sunlight toward the courtyard 14. A number of light radiators 50 are located on the inner peripheral wall of the building 10 so that the light emitted from each of the light radiators 50 will be directed across the space 12 to illuminate its facing wall as well as the flower balcony D. Light radiators 52 are installed in the rooms of the building 10 which the sunlight cannot reach, e.g. rooms 53 in the northern part of the building 10. Further, a light radiator 54 is disposed in the basement 16. Each of these light radiators 50—54 is optically connected to the sunlight collector 28 by an optical cable 56 so as to be supplied with the collected sunlight.

In accordance with the present invention, the pit 20 adapted to collect the ground water W may be constructed to culture or cultivate various forms of life therein. In the illustrated embodiment, the pit 20 is subdivided into a fish breeding section 58, a mushroom culturing section 60 and an algae or plant culturing section 62, by way of example. Again, each of these sections 58—62 is illuminated by a light radiator 64 which is optically connected to the sunlight collector 28 by an optical cable 56. The resultant multiplication in the sections 58—62 will proceed as effectively as on the ground due to the supply of the sunlight. For the supply of air, air induction pipes 65 and 67 communicate the basement 16 and the various culture sections 58—62 to the outside of the building 10, respectively.

A staircase F leads from the first floor A of the

building 10 to the basement 16 while a staircase G extends from the basement 16 to the culture sections 58—62. Where the basement 16 is used as a shelter in the case of emergency, the staircase G permits one to make access to the culture sections 58—62 in order to collect desired food-stuffs cultivated therein.

Furthermore, a conduit 66 extends from the piping 24 downstream of the pump P to terminate at a fire hydrant 68, which is located on the first floor A of the building 10. Firefighting water is also supplied from the cistern 18 in the basement 16 by a conduit 70 which also terminates at the fire hydrant 68.

The outside diameter of the dome 30, relative to the height and outside diameter of the building 10, has to abide by regulations, if any. For example, the angle α between the lines T_1 and T_2 extending from the shoulders 10a tangentially to the dome 30 as shown in Figure 1 must be made smaller than a predetermined angle in accordance with a horizontal distance between the building 10 and a neighboring road. This angle α is related with the ratio in outside diameter of the dome 30 to the building 10 as well as the overall height of the building 10. Hence, the dimensions of the dome 30 should also be determined in due consideration of the distance between the building and the adjacent road, height and diameter of the building and angle α between the lines T_1 and T_2 .

In summary, it will be seen that the present invention provides a lighting system which realizes quite a useful and comfortable building in which all the desired spaces are full of sunshine as long as it is available. Even the basement or the ground water pit serves a specific function as described with the aid of the sunshine conducted thereto.

While the building to which the present invention is applicable has been shown and described as providing for apartments for living quarters, it may naturally provide for offices in an urban district.

Claims

1. A building structure for living quarters with an upright structure and an underground structure, with a sunlight collector means (28) positioned on top of the building (10) for collecting the sunlight, with the light conductor means (56) for conducting the sunlight, collected by said sunlight collector means and with radiator means (50, 52, 54) for radiating the sunlight conducted by the light conductor means in a desired space within said building characterized in that, in combination, said building (10) has a substantially annular cross-section, except for the first floor (A) thereof, and an inner cylindrical open space (12) which forms a courtyard (14) in order that trees may be planted therein, and that said light radiator means (50) are disposed in said cylindrical open space (12) on the inner peripheral wall of the building (10).

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Furthermore, a conduit 66 extends from the piping 24 downstream of the pump P to terminate at a fire hydrant 68, which is located on the first floor A of the building 10. Firefighting water is also supplied from the cistern 18 in the basement 16 by a conduit 70 which also terminates at the fire hydrant 68.

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2. A building according to claim 1, characterized in that a further light radiator means (52) is disposed in a room (53) of the building (10) which remains in the shade during the daytime.

3. A building according to claim 1 or 2, characterized in that a further light radiator means (54) is disposed in said underground structure (16).

4. A building according to any one of the foregoing claims, characterised in that the underground structure includes a basement (16) having therein a system (20) for storing water (W).

5. A building according to claim 4, characterized in that the underground structure includes a pit (20) for collecting ground water (W) therein.

6. A building according to claim 5, characterized in that the pit is constructed to define at least one cultivating chamber (58, 60, 62) for cultivating a desired form of life.

7. A building according to claim 6, characterized in that the desired form of life is fish.

8. A building according to claim 6, characterized in that the desired form of life is a plant to eat.

9. A building according to claim 6, characterized in that said desired form of life is mushroom.

Patentansprüche

1. Gebäude mit Wohnungen, mit einem sich nach oben vom Boden erstreckenden Teil und mit einem unter den Boden reichenden Teil, mit einer Sonnenlicht sammelnden Einrichtung (28), die oben auf dem Gebäude (10) angeordnet ist und die Sonnenlicht einfängt, mit einer Lichtleitereinrichtung (26), die das von dem Sonnenkollektor eingesammelte Licht weiterleitet und mit Strahlereinrichtungen (50, 52, 54), die das von den Lichtleitereinrichtungen weitergeleitete Licht in einen gewünschten Raum innerhalb des Gebäudes weiterleitet, gekennzeichnet durch die Kombination, daß das Gebäude (10) einen im wesentlichen ringförmigen Querschnitt, mit Ausnahme des ersten Stockes (A), aufweist, und daß ein innerer zylindrischer offener Raum (12) vorhanden ist, der einen Hof (14) darstellt, in dem Bäume gepflanzt werden können und daß die genannte lichtabstrahlende Einrichtung (50) in dem zylindrischen offenen Raum (12) am Innenumfang der Gebäudewand (10) angeordnet ist.

2. Gebäude nach Anspruch 1, dadurch gekennzeichnet, daß eine weitere lichtabstrahlende Einrichtung (52) in einem Raum (53) des Gebäudes (10) angeordnet ist, der während des Tages im Schatten liegt.

3. Gebäude nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß eine weitere lichtabstrahlende Einrichtung (54) in dem unter dem Boden liegenden Teil (16) des Gebäudes angeordnet ist.

4. Gebäude nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß in dem unter dem Boden gelegenen Teil des Gebäudes ein Bereich (16) vorhanden ist, in dem ein System (20) zum Aufbewahren von Wasser ausgebildet ist.

5. Gebäude nach Anspruch 4, dadurch gekennzeichnet, daß der unter der Erde liegende Teil des

Gebäudes eine Grube (20) zum Sammeln von Grundwasser (W) aufweist.

6. Gebäude nach Anspruch 5, dadurch gekennzeichnet, daß die Grube so gebaut ist, daß sie wenigstens eine Pflanzkammer zum Anpflanzen einer gewünschten Art von Lebewesen ermöglicht.

7. Gebäude nach Anspruch 6, dadurch gekennzeichnet, daß die gewünschte Art von Lebewesen Fische sind.

8. Gebäude nach Anspruch 6, dadurch gekennzeichnet, daß die gewünschte Art von Lebewesen eine Pflanze zum Essen ist.

9. Gebäude nach Anspruch 6, dadurch gekennzeichnet, daß die gewünschte Art von Lebewesen Pilze sind.

Revendications

1. Une structure de bâtiment pour des quartiers d'habitation comportant une structure en élévation et une structure souterraine, un moyen collecteur de lumière solaire (28) disposé en haut du bâtiment (10) pour collecteur la lumière solaire, un moyen conducteur de lumière (56) pour canaliser la lumière solaire collectée par ledit moyen collecteur de lumière et des moyens de rayonnement de lumière (50, 52, 54) pour rayonner la lumière solaire canalisée par le moyen conducteur de lumière dans un espace désiré à l'intérieur du bâtiment, caractérisée en ce que, en combinaison, ledit bâtiment (10) a une section droite sensiblement annulaire, excepté pour le premier étage (A), et comporte un espace ouvert cylindrique intérieur (12) qui forme une cour (14) de manière que des arbres puissent être plantés dans celle-ci, et en ce que lesdits moyens de rayonnement de lumière (50) sont disposés dans ledit espace ouvert cylindrique (12) sur la paroi périphérique intérieure du bâtiment (10).

2. Un bâtiment conforme à la revendication 1, caractérisé en ce qu'un autre moyen de rayonnement de lumière (52) est disposé dans une pièce (53) du bâtiment (10) qui reste dans l'ombre pendant la journée.

3. Un bâtiment selon la revendication 1 ou 2, caractérisé en ce qu'un autre moyen de rayonnement de lumière (54) est disposé dans ladite structure souterraine (16).

4. Un bâtiment selon une quelconque des revendications précédentes, caractérisé en ce que la structure souterraine comprend un sous-sol (16) contenant un système (20) pour emmagasiner de l'eau (W).

5. Un bâtiment selon la revendication 4, caractérisé en ce que la structure souterraine comprend un puits (20) pour collecter de l'eau de fond (W).

6. Une structure de bâtiment selon la revendication 5, caractérisé en ce que le puits est réalisé de façon à délimiter au moins une chambre de culture (58, 60, 62) servant à cultiver une forme désirée de vie.

7. Un bâtiment selon la revendication 6, caractérisé en ce que la forme désirée de vie est



du poisson.

8. Un bâtiment selon la revendication 6, caractérisé en ce que la forme désirée de vie est une plante à manger.

9. Un bâtiment selon la revendication 6, caractérisé en ce que ladite forme désirée de vie est un champignon.

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