July 14, 1970 W. B. JOHNSTON 3,520,098

MODULAR UNIT ASSEMBLY FOR FURNITURE OR BUILDING CONSTRUCTION

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Fig. 1.

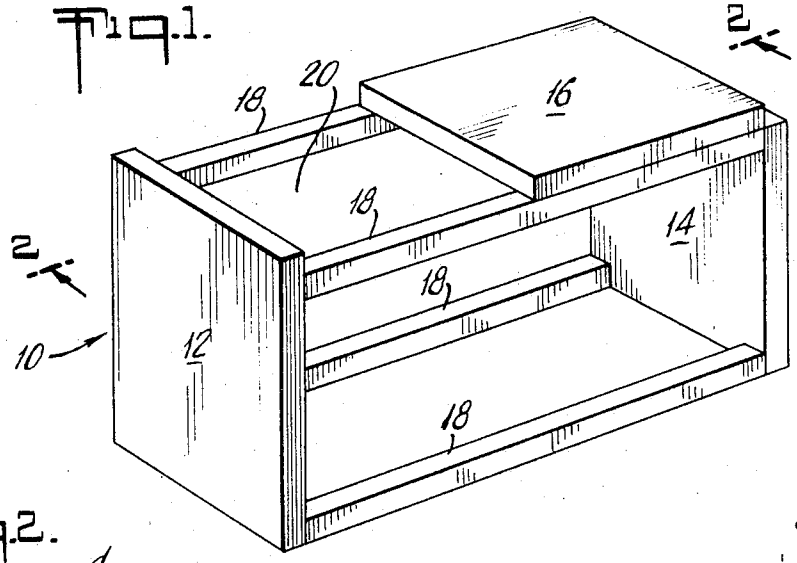


Fig. 2.

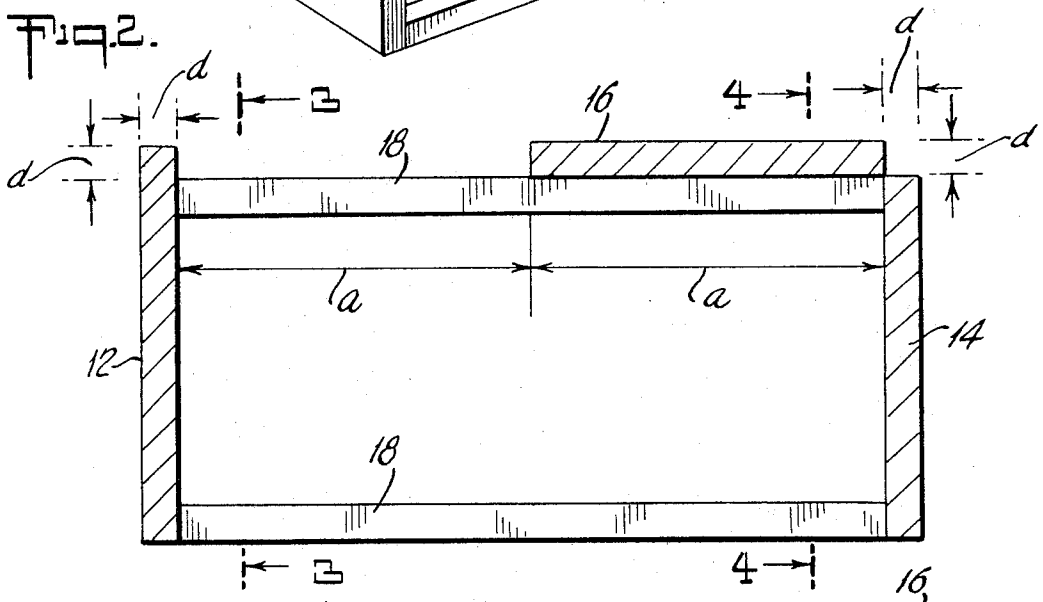
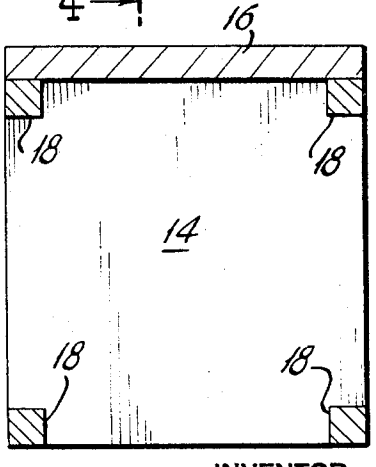


Fig. 4.



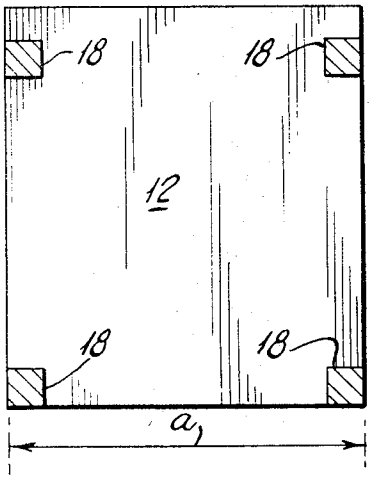


Fig. 3.

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Fig. 5.

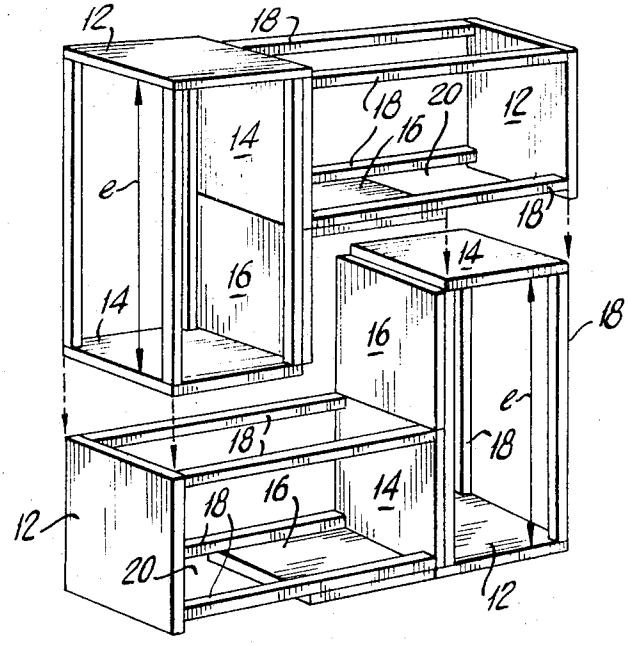


Fig. 6.

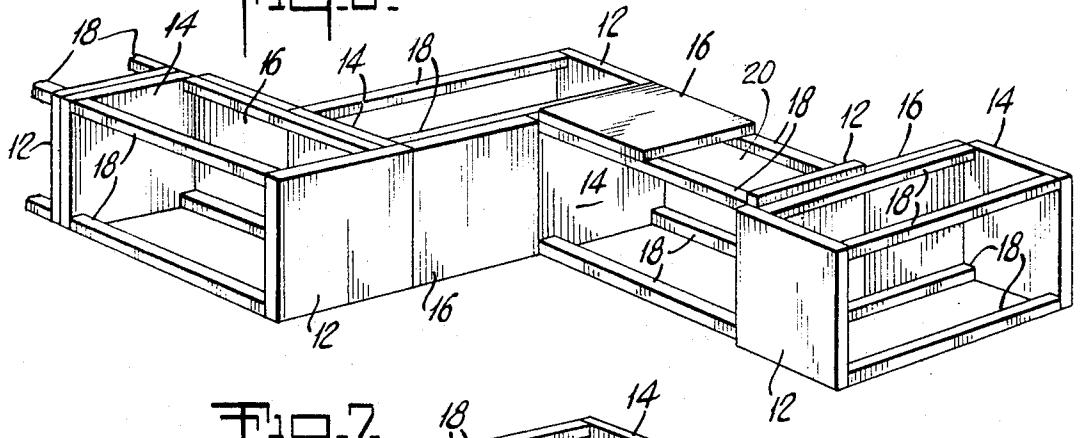
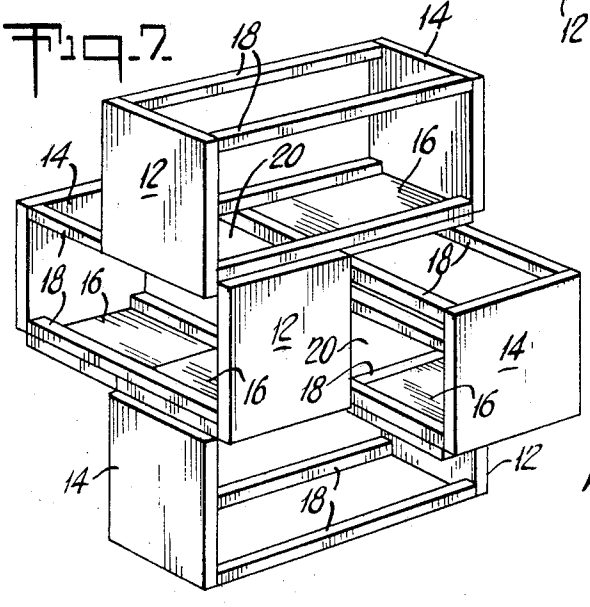


Fig. 7.



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Fig. 8.

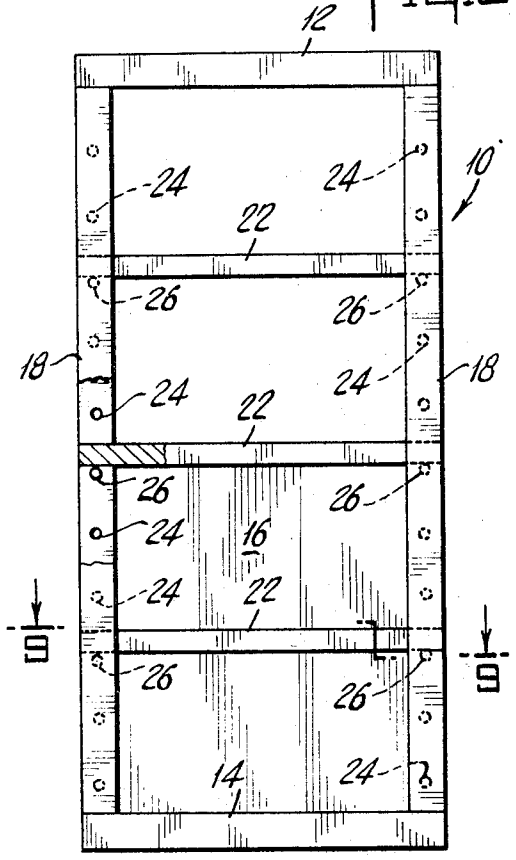


Fig. 10.

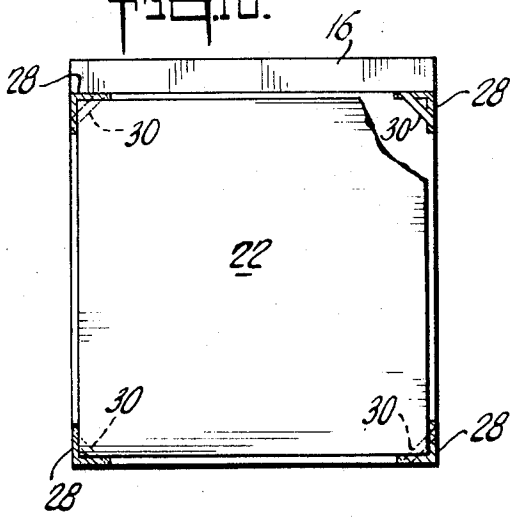


Fig. 11.

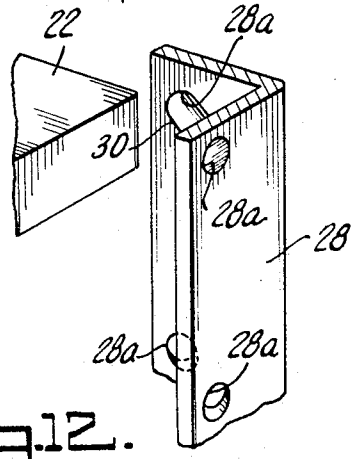


Fig. 9.

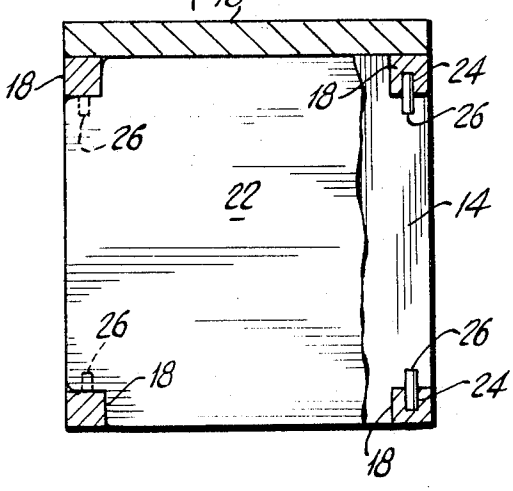
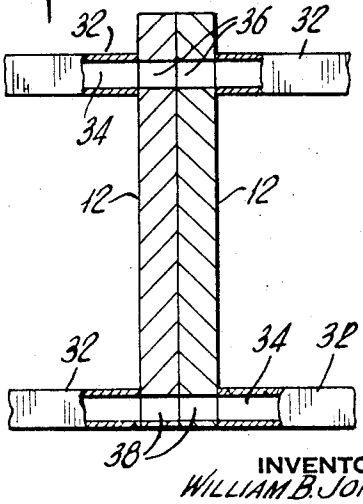


Fig. 12.



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MODULAR UNIT ASSEMBLY FOR FURNITURE OR BUILDING CONSTRUCTION

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Int. Cl. E04c 1/08, 1/39
U.S. Cl. 52—503 10 Claims

ABSTRACT OF THE DISCLOSURE

A modular unit for use as furniture or in building construction. A multiplicity of these modular units can be assembled to form, for example, boockcases, shelving or in larger dimensions, as living or business quarters. The modular units may be stacked vertically in an interfitting manner or extended in an horizontal arrangement.

BACKGROUND OF THE INVENTION

Modular units for furniture are known in which selective stacking of units can be arranged to form a predetermined configuration. However, these modular units permit only a limited number of possible design configurations and most cases can be stacked in one plane only. In addition, these known modular units are not adaptable to be used both as furniture and as building construction modules. In regard to the latter, it is desirable to have a building construction module in which the various services, such as electrical, plumbing and heating can be built directly into certain structural members of the unit.

With regard to the utilization of modular units as furniture, it is desired to point out that heretofore modular units were heavy and bulky and difficult to transport and connect together.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a modular unit for furniture which interfits with other identical modular units in a variety of configurations which may or may not be in the same plane.

Another object of the present invention is to provide modular units which may be scaled up in size for use in the building construction industry.

A further object of the present invention is to provide a modular unit for the building industry in which elongated structural members are hollowed out and services such as electrical, plumbing and heating are adapted to be drawn therethrough and interconnected with similar services in adjacent modular units to thereby create an effective building arrangement in which all the services are pre-installed and out of view. In addition, no additional space is required for the services which occupy otherwise dead space in the elongated structural members.

It is another object of the present invention to arrange the modular units either horizontally or vertically. In the latter case, a two-story opening can be created whereby objects having large vertical dimensions can be displayed or stored.

It is a further object of the present invention to provide a modular unit for furniture or building construction which has a minimum of structural elements yet has considerable strength. The present modular unit can be manufactured inexpensively and in a variety of structural materials.

The invention will best be understood with reference to the following description and accompanying drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a single modular unit for furniture or building construction, shown in accordance with the teachings of my invention;

FIG. 2 is a sectional view of the modular unit taken along the lines 2—2 of FIG. 1;

FIG. 3 is a sectional view of the modular unit taken along the lines 3—3 of FIG. 2;

FIG. 4 is another sectional view of the modular unit taken along the lines 4—4 of FIG. 2;

FIG. 5 is an exploded view of one of the arrangements of a group of modular units illustrating how the units interfit;

FIGS. 6 and 7 are two examples of other arrangements of the modular units, FIG. 6 showing an horizontal arrangement while FIG. 7 shows a vertical arrangement extending in various planes;

FIG. 8 is an end view of a stacked vertical arrangement of modular units having shelves or partitions and means for securing the same in the modular units;

FIG. 9 is a view taken along the section 9—9 of FIG. 8;

FIG. 10 is an end view with part broken away of an alternative embodiment of the present modular unit in which some of the structural members are angle irons with fastening means;

FIG. 11 is a partial perspective view of an elongated stringer and an angle iron connecting means; and

FIG. 12 is a partial sectional and a partial elevational view of two modular units connected back to back and suitable for building construction.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring particularly to the drawings and especially FIGS. 1–7 thereof, the modular unit for furniture or building construction is shown which may be fabricated of wood, metal, plastic or any other suitable material. Each identical modular unit is referred to generally by the numeral **10** and have end panels **12** and **14** and top panel **16**. The end panels **12** and **14** are spaced a predetermined distance apart and are interconnected preferably by four stringers **18**. The top panel **16** is rigidly mounted directly on the top pair of stringers **18** adjacent to the opening **20**.

Referring to FIG. 2 it will be noted that the dimensions *a* are equal, and the dimensions *d* are also equal. In this regard, it should be noted that end panel **12** has a height which is greater than end panel **14**, exactly by the dimension *d*. The dimension *a* shown in FIG. 3 is also equal to either of the two dimensions *a* shown in FIG. 2. Because of the equal dimensions *a* and *d* the modular unit may interfit in a variety of configurations, for example as shown in FIGS. 5, 6 and 7 of the drawings. The modular units may be stacked vertically or horizontally and may be disposed in a variety of planes. The arrangement shown in FIG. 5, for example, may be used as a combination bookcase and display unit. The vertical height *e* of the modular units positioned vertically in FIG. 5 is sufficient to accommodate objects having large vertical dimensions, such as statuary. The arrangements shown in FIGS. 6 and 7 can be either for bookcases, general purpose shelving or building units. For example in FIG. 7, the openings **20** from one module level to the module level above functions as a stair well and permits the installation of stairs therein, thus making a multi-level housing structure.

FIGS. 8 and 9 show a modular unit **10** having a plurality of partitions or shelves **22** which are supported by pins **26** projecting from holes **24** in the stringers **18** at preselected spaced intervals to thereby permit adjustable spacing of the shelves or partitions **22**.

FIGS. 10 and 11 show another embodiment of the

present invention in which angle iron structural members **28**, together with pins **30** passing through holes **28***a* in the angle irons, are utilized to support shelving on partitions **22** instead of stringers **18**.

FIG. 12 is a modular unit particularly suitable for building construction, such as for living units or for business purposes. The modular units **10** in this case are mounted back-to-back and the stringers or cross pieces **32** are hollow as shown at **34** and are aligned with corresponding openings **36** and **38** in the abutting end panels **12**. In this manner the essential services for the building unit, such as plumbing, electrical and heating, may be drawn through the conduit formed by the hollow and openings to thereby make the modular unit a complete living area with the building services concealed from view and occupying what would otherwise be dead space in the modular unit.

What I claim is:

1. A modular unit assembly in which each modular unit comprises first and second spaced panels, a plurality of spaced stringers interconnecting said spaced panels to form a self-supporting structural element, a third panel secured to at least one of said spaced stringers and of the same dimensions as the first spaced panel, one edge of said third panel being located a distance from the outer surface of said first spaced panel substantially equal to the thickness of the latter, the opening formed between the edge opposite the one edge of said third panel and the second spaced panel being substantially equal to the peripheral dimensions of said third panel, and permitting each of the panels of another modular unit to be selectively inserted in said opening and said second panel extending above the adjacent stringers a distance equal to the distance the one edge of said third panel is located from the outer surface of said first spaced panel.

2. A modular unit assembly as claimed in claim **1** wherein each of said units are generally rectangular in shape and each of the stringers have identical rectangular cross-sections.

3. A modular unit assembly as claimed in claim **2** wherein there are four spaced stringers connecting the first and second panels.

4. A modular unit assembly as claimed in claim **1** wherein said second panel is longer than said identical first and thirds panels.

5. A modular unit assembly as claimed in claim **1** wherein said third panel is supported by a pair of spaced stringers and said distance said second panel extends beyond said stringers is equal to the thickness of said third panel.

6. A modular unit assembly as claimed in claim **1** further comprising a plurality of partitions therein and means in said stringers for supporting said partitions.

7. A modular unit assembly as claimed in claim **6** wherein said stringers are angle irons with a plurality of spaced holes therein, and said supporting means passing through said holes in the angle irons.

8. A modular unit assembly as claimed in claim **1** wherein at least some of said stringers are hollow thereby forming a conduit for building services.

9. A modular unit assembly as claimed in claim **8** wherein panels of adjacent abutting modular units are provided with openings aligned with each other and the openings in said stringers to form a pass-through for building services from one modular unit to an adjacent abutting modular unit.

10. A modular unit assembly as claimed in claim **1** wherein twice the width dimension of said first panel is equal to the distance between the inside wall surfaces of said first and second panels.

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U.S. Cl. X.R.

52—79, 593; 108—101