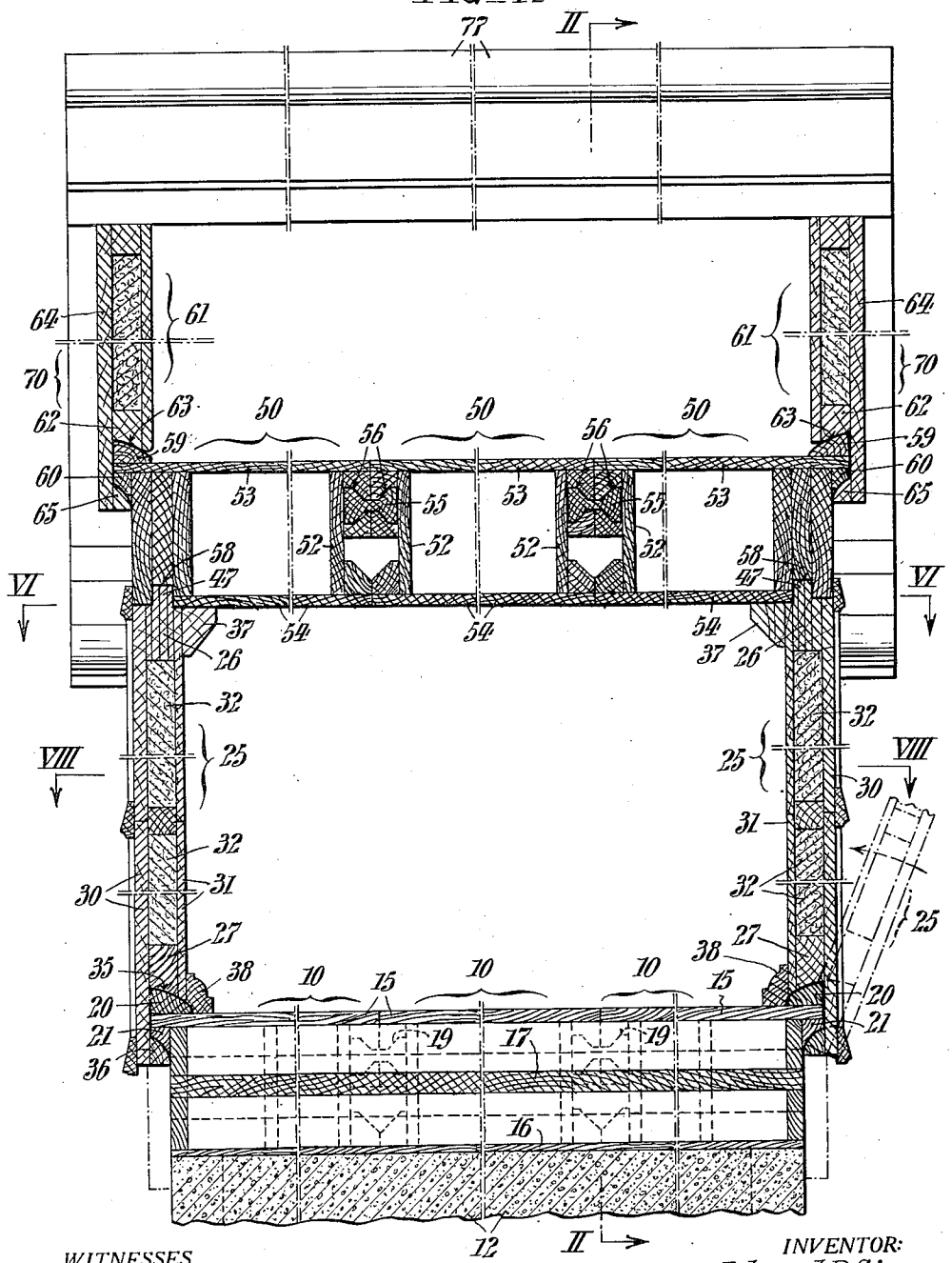
Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 1

FIG. 1.



WITNESSES

Hubert Fuchs

Thomas W. Kerr, Jr.

INVENTOR:

Edward P. Simon,

BY Paul & Paul

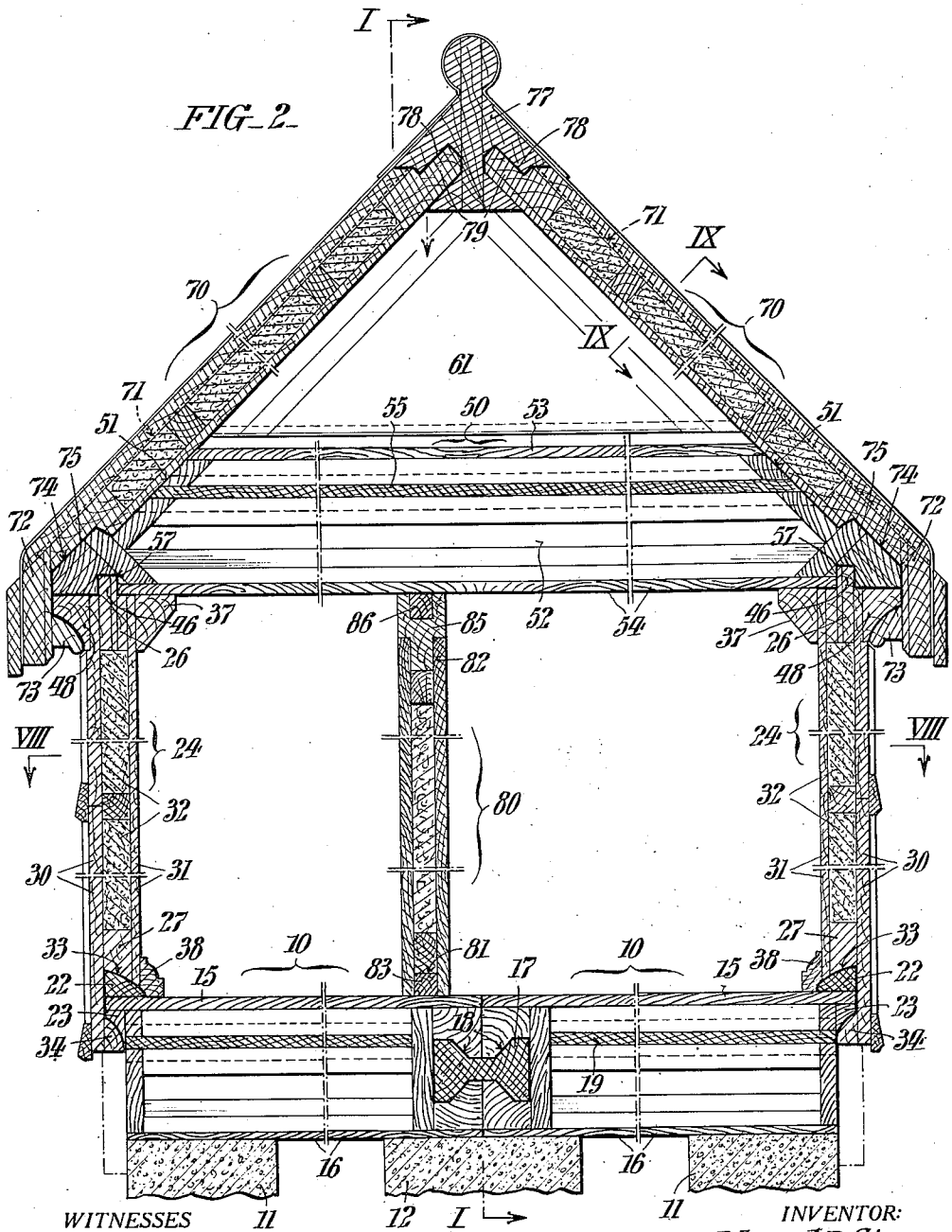
ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 2

FIG. 2.



WITNESSES

Hubert Fuchs

Thomas W. Kerr, Jr.

INVENTOR:

Edward P. Simon,

BY Paul & Paul

ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 3

FIG. 10.

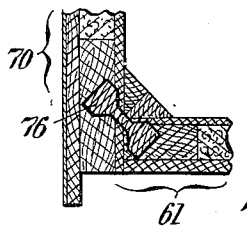


FIG. 3.

WITNESSES

Hubert Fuchs

Thomas W. Kerr, Jr.

INVENTOR:

Edward P. Simon,

BY Paul & Paul

ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 4

FIG. 4.

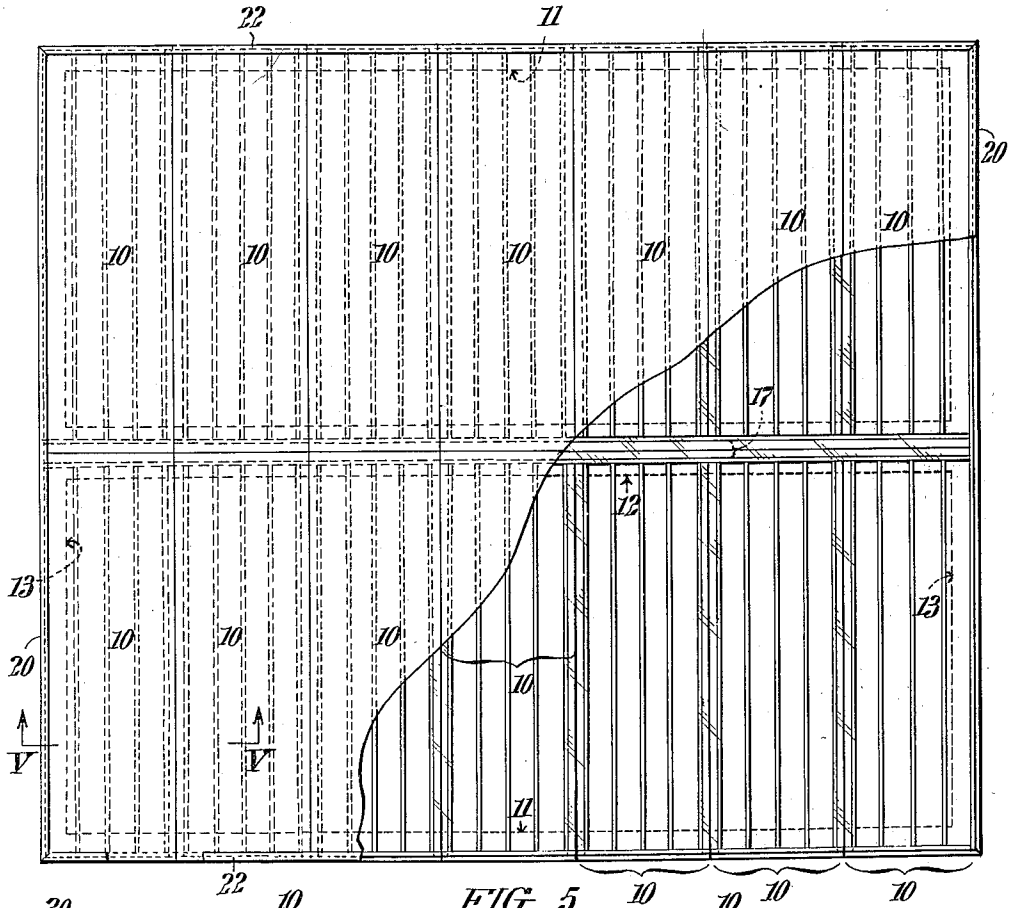
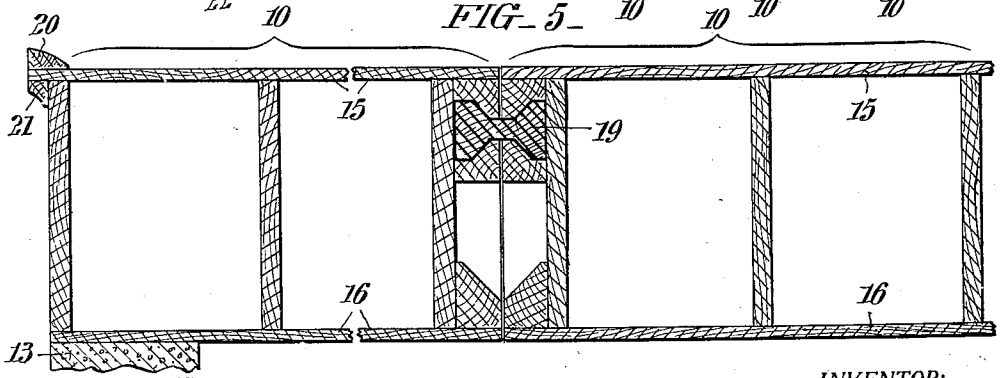


FIG. 5.



WITNESSES

Hubert Fuchs

Thomas W. Kerr, Jr.

INVENTOR:
Edward P. Simon,

BY Paul & Paul

ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 5

FIG. 6.

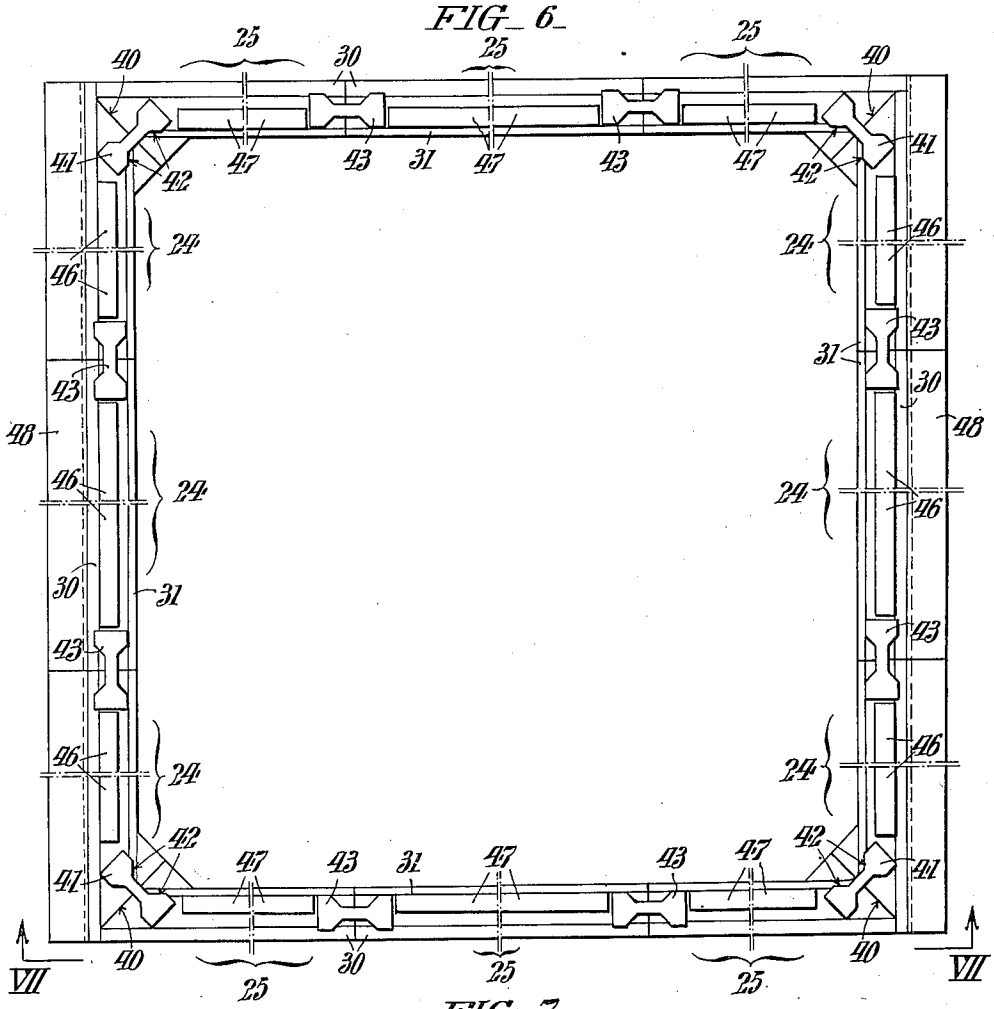
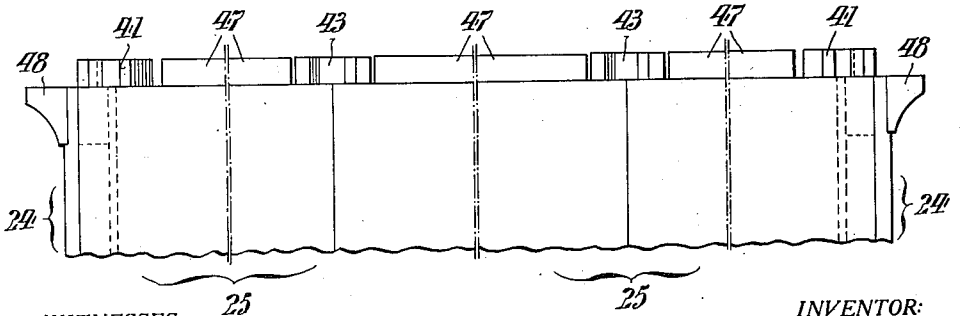


FIG. 7.



WITNESSES

Hubert Fuchs

Thomas W. Ferry Jr.

INVENTOR:

Edward P. Simon,

BY Paul & Paul

ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 6

FIG. 8.

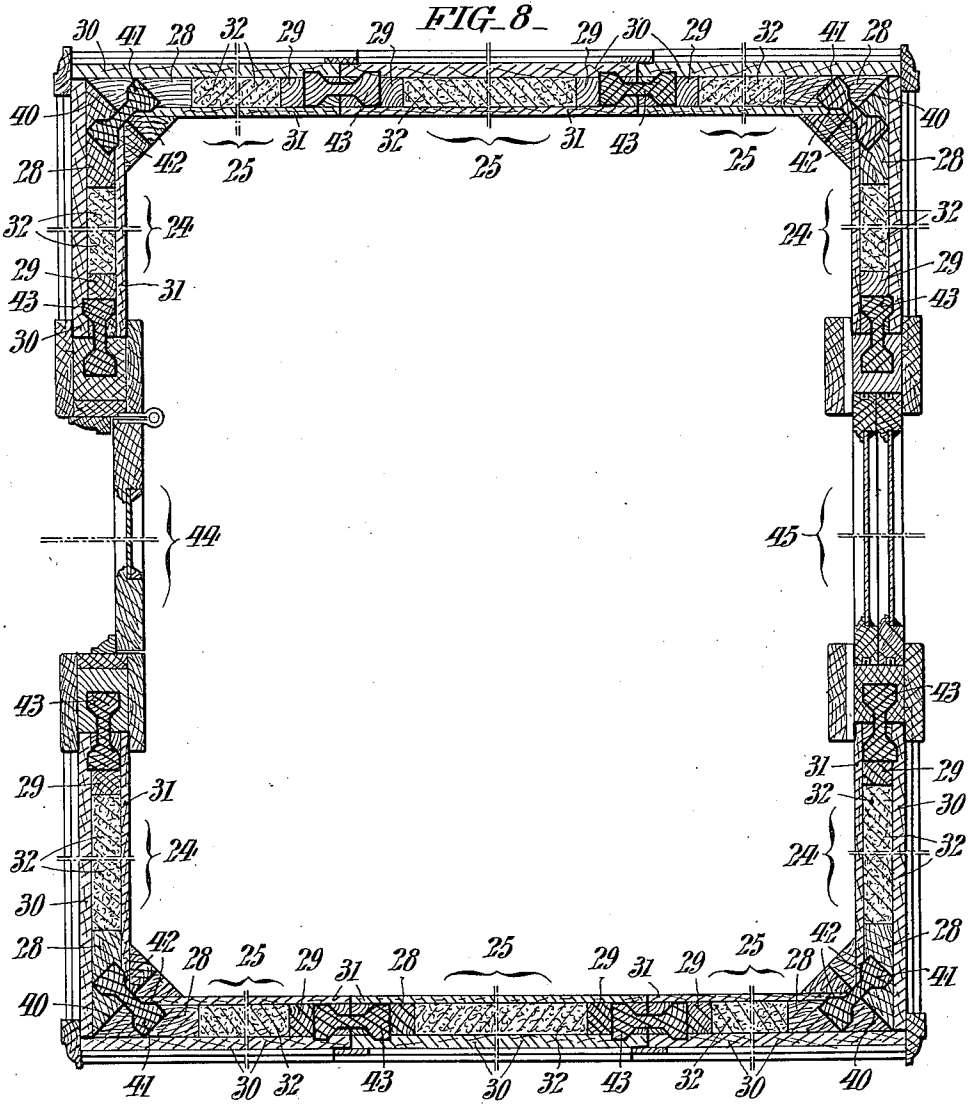
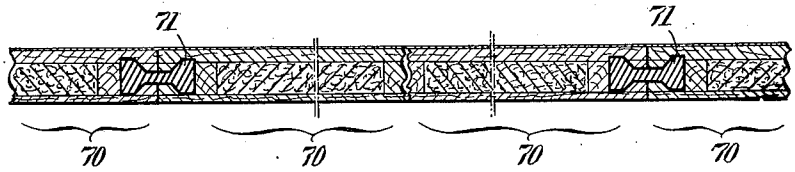


FIG. 9.



WITNESSES

Hubert Fuchs

Thomas W. Kerr Jr.

INVENTOR:
Edward P. Simon,

BY Paul & Paul

ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 7

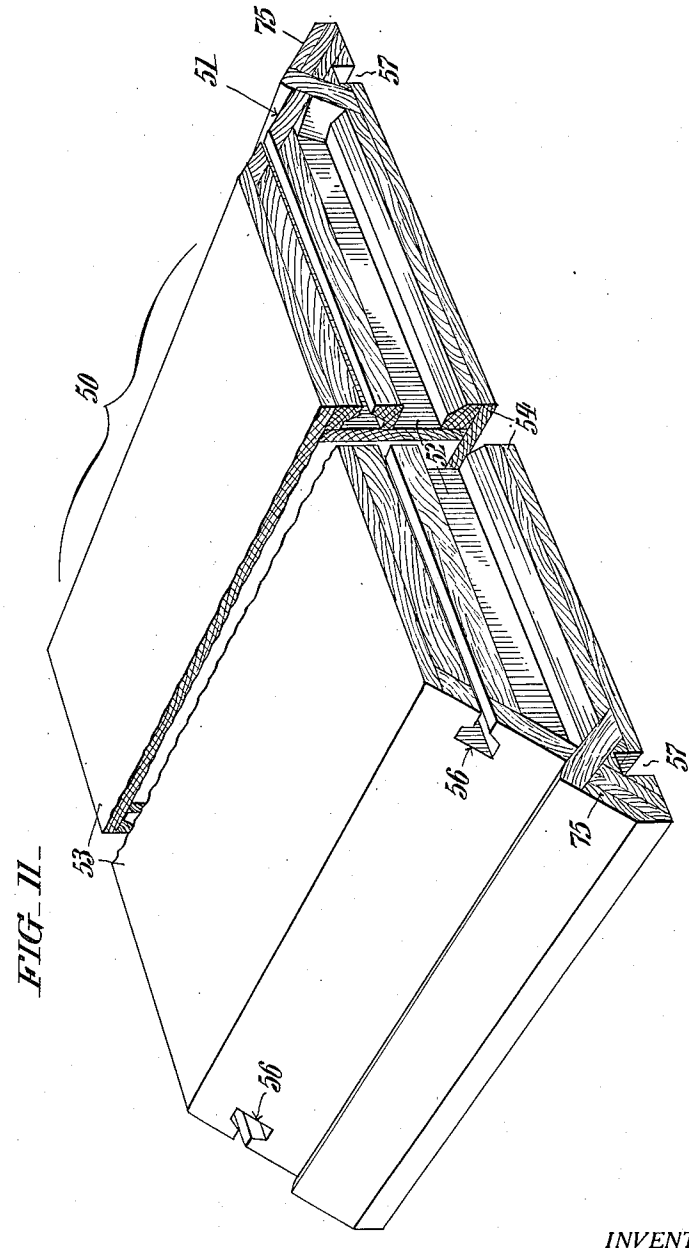


FIG. 11.

WITNESSES

Hubert Fuchs

Thomas W. Kerr Jr.

INVENTOR:
Edward P. Simon,

BY Paul & Paul

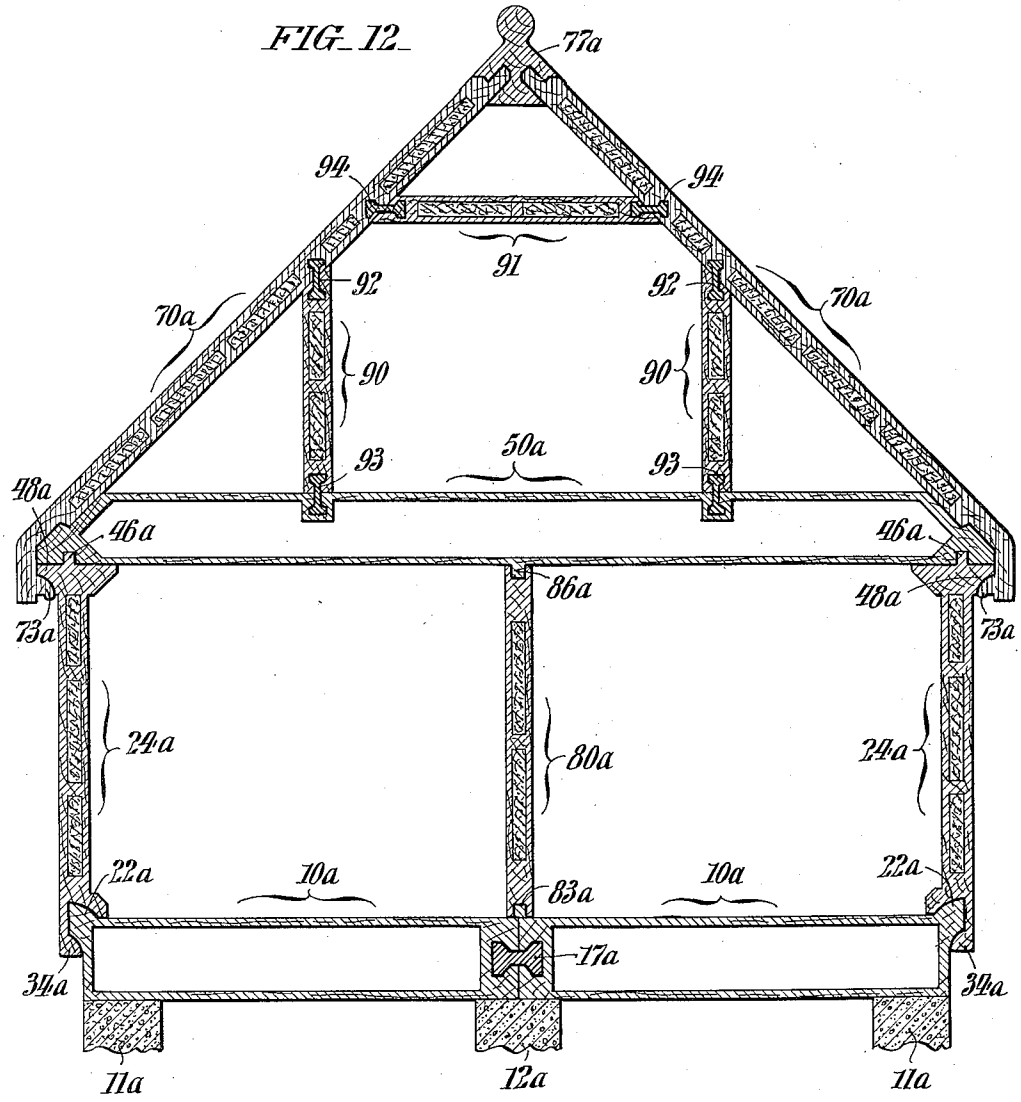
ATTORNEYS.

Feb. 12, 1952 E. P. SIMON 2,585,051

BUILDING

Filed Oct. 26, 1946 8 Sheets-Sheet 8

FIG. 12.



WITNESSES

Hubert Fuchs

Thomas W. Ferry Jr.

INVENTOR:
Edward P. Simon,

BY Paul & Paul

ATTORNEYS.

Patented Feb. 12, 1952 2,585,051

UNITED STATES PATENT OFFICE

2,585,051

BUILDING

Edward P. Simon, Philadelphia, Pa.; Edith D. Simon, executrix of said Edward P. Simon, deceased, assignor to Lyle F. Boulware, Philadelphia, Pa.

Application October 26, 1946, Serial No. 705,958

5 Claims. (Cl. 20—2)

1

This invention relates to buildings, and has reference more particularly to individual buildings intended for use as dwellings.

Heretofore in building construction, each component member or element was designed for capacity to itself withstand the total stresses or strains due to weight load, wind pressure or other causes which it might be called upon to bear at any point thereof, and to my knowledge no attempt was ever made to utilize the latent resistence of other components of the buildings to share such stresses or strains. Under these conditions, the various structural components of the buildings had to be made relatively heavy and entailed the use of correspondingly large amounts of material in their individual construction. One of the aims of my invention is to overcome the above drawbacks of the prior art practice, which objective is realized as hereinafter more fully disclosed, through provision of a system of interlocking joints by which the floor, wall, roof and interior partition wall components of the buildings are effectively united in such a manner that the stresses or strains to which any one or more of them may be directly subjected at any one time are communicated to and proportionately shared by all of the others in the building, to the advantage that the different components can be constructed much lighter than ordinarily without sacrifice in the strength and stability of the completed buildings, and at a great saving in the amount of material used in their fabrication.

A further aim of my invention is to enable buildings to be constructed in quality more quickly than heretofore, as well as more economically from the standpoint of labor costs. This latter objective is also attained as hereinafter more fully disclosed, through provision of prefabricated floor, wall, roof and interior partition components or units which are so dimensioned as to allow of their being readily handled incident to transportation from the factory as well as during erection of the buildings, and in which are incorporated means by which they are connected and interlocked one with another incident to assembling in the manner and for the purpose herein before pointed out, the joints being of such character that seepage of water or air cannot take place through them.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein Fig. 1 is a broken out more or less diagrammatic view of a gable ended building conveniently embodying

2

my invention, the section being taken as indicated by the angled arrows I—I in Fig. 2.

Fig. 2 is a transverse sectional view of the building taken as indicated by the angled arrows II—II in Fig. 1.

Fig. 3 shows the elevation of one end of the building with portions broken out and shown in section for the better illustration of important details.

Fig. 4 shows the ground floor structure of the building in top plan, likewise with a portion broken out and parts thereof in horizontal section.

Fig. 5 is a fragmentary detail view drawn to a larger scale taken as indicated by the angled arrows V—V in Fig. 4.

Fig. 6 is a plan view looking as indicated by the angled arrows VI—VI in Fig. 1.

Fig. 7 is a fragmentary view in elevation looking as indicated by the angled arrows VII—VII in Fig. 6.

Fig. 8 is a horizontal sectional view taken as indicated by the angled arrows VIII—VIII in Figs. 1 and 2.

Figs. 9 and 10 are fragmentary detail sections taken as indicated respectively by the angled arrows IX—IX and X—X in Figs. 2 and 3.

Fig. 11 is a perspective view of a prefabricated section designed for use in the formation of the upper floor of the building; and

Fig. 12 is a view in transverse section similar to Fig. 2 but more diagrammatically represented, of a somewhat modified embodiment of my invention.

As herein illustrated, my improved building has a ground floor structure (Fig. 4) made up of prefabricated straight-sided sections or units 10 which are preferably of the same dimensions throughout and of similar construction except for certain details as presently noted. The ground floor sections 10 are laid side by side and in the illustrated instance arranged in rows lengthwise of the building, with their outer ends resting on the longitudinal walls 11 of a prelaid masonry foundation, and with their inner mutually-abutting ends resting on an intermediate longitudinal 12 of the foundation, the respectively remote end sections 10 of the two series being supported along their outer edges upon the end walls 13 of said foundation. Each ground floor section 10 comprises a number of spaced joist members to which the floor boards 15 are secured and which are connected at their bottoms by sub-boards 16. The sections 10 of the two series are locked together by a double

dove tail key 17 which extends longitudinally of the building through complementally-arranged undercut key ways 18 formed in their abutting inner ends as shown in Fig. 2. The abutting side edges of adjacent sections 10 in each row are similarly locked together by transverse keys 19 (see Fig. 5) which may extend inward to the longitudinal key 17 (Fig. 4) as indicated in dotted lines in Fig. 2. The floor boards 15, it will be noted from Fig. 5, extend somewhat beyond the outer ends of the sections 10; and to the projecting portions are secured, at the top, convex ridge strips 20, and at the bottom concaved strips 21. Similar ridge strips 22 and 23 are secured along projecting portions of the flooring 15 at the outer edges of the sections as shown in Fig. 2. The function of the strips 20, 21 and 22, 23 will be pointed out later.

The outer side and end walls of the building are similarly composed of pre-formed standardized hollow sections 24, 25 respectively which, in turn, are identical except for certain details presently noted. As shown, each side wall section 24, 25 has a foundation frame consisting of horizontal top and bottom members 26, 27 and vertical side edge members 28, 29 respectively to which the outer and inner wall boards 30 and 31 are secured. The hollows of the wall sections may be filled with rock wool or other suitable thermal insulation as conventionally indicated at 32. The outer boards 30 of the side wall sections 24 extend below the level of the floor boards 15, and their bottom frame members 27 are cut away on a curve as at 33 to fit over the strips 22 of the ground floor structure, as shown in Fig. 2, and to the extended portions of said side boards are secured convex strips 34 to fit over the concaved strips 23 on said ground floor structure. From Fig. 1 it will be observed that the same construction is resorted to in the end wall sections 25 where the outer boards 30 are extended below the floor level, and the bottom frame members 27 concavely rounded at 35 to fit the strips 20 and the convex strips 36 secured to the extensions of said boards to fit under the concaved strips 21. As shown in Figs. 1 and 2, the wall sections 24 and 25 are provided at the top and bottom with interior finishing strips 37 and 38 respectively. In consequence of the construction just described, the side and end wall sections 24, 25 can be swung upward from horizontal position in the manner indicated in broken lines in Fig. 1 to the full line vertical position, with attendant interlocking of their bottom edges with the corresponding edges of the floor, the strips 20, 34 and 22, 36 thereafter preventing lateral and upward displacement of such sections. The endmost sections of adjacent side and end walls are complementally beveled along contiguous vertical edges as at 40 in Fig. 8 to meet in miter joints and are locked together by double dove tail keys 41 engaging complemental key ways 42 in said edges as shown in Fig. 8. The intermediate sections of the side and end walls are similarly interlocked along their mutually abutting side edges by vertical keys 43. Certain of the side or end wall sections may be provided with doors as instanced at 44 in Fig. 3, and others of said sections with windows as instanced at 45. In addition to the various features already described in connection with them, the component sections 24, 25 of the side and end walls are provided at their top edges with upwardly extending tongues 46 and 47, see Figs. 6 and 7, for a purpose hereinafter set forth. The endmost components 25 of the side walls are moreover provided on their outer faces and along their top edges with concaved strips 48.

The upper or attic floor of the building comprises a plurality of prefabricated hollow truss-like sections 50 which are relatively deep and which in the illustrated instance, are of a length to span the building from one side wall to the other, one of these sections being shown in perspective in Fig. 11. Each section 50 has its ends complementarily sloped as at 51 and is interiorly braced by suitably-spaced joist-like members 52 to which the floor boards 52 are secured at the top, and which are connected at the bottom by sub-boards 54 to serve as a ceiling for the lower story of the building. Adjacent sections 50 are locked together by keys 55, like those previously described, run endwise through complemental key ways 56 in their mutually abutting side edges, see Fig. 1. At opposite ends, the sections 50 are grooved at the bottom as at 57 to engage over the upstanding tongue projections 46 at the tops of the side wall sections 24 as shown in Fig. 2. Adjacent their outer sides at the bottom, the endmost sections are provided with similar grooves 58 (Fig. 1) to fit over the upstanding tongues 47 at the tops of the end wall sections 25. By reason of this last described construction, it will be seen that the top floor structure effectively ties together the four walls of the building. The floor boards 53, see Fig. 1, are extended beyond the outer side edges of the endmost sections 50, and to the projecting portions are secured, top and bottom, convex and concaved strips 59 and 60 respectively.

The attic of the building is closed in at the ends by preformed gable sections 61, which, like all the other wall sections, are constructed hollow and may be filled with insulation. They are made triangular in shape with sloping edges to coincide with the sloping ends 51 of the upper floor sections 50 as shown in Fig. 3. The bottom cross member 62 of each gable section 61 is convexly cut as at 63 to fit onto the convex strip 59 on the corresponding endmost section 50 of the attic floor structure as shown in Fig. 1, and their outer boards 64 are extended below said cross member and have secured to them a convex strip 65 to snugly engage beneath the concaved strip 60 on said attic floor section. This arrangement makes possible the upward swinging of the gable sections 61 to vertical position from the horizontal about the hinge juncture constituted by the parts 59, 60, 62 and 65, with incidental locking of said sections against either up or down displacement after they have been assembled.

The sloping roof sides are in turn composed of suitably internally braced hollow prefabricated sections 70 of standardized dimensions which, in turn, may be filled with insulating material, and adjacent sections interlocked along their mutually abutting side edges by double dove tail keys 71 as shown in Fig. 9. At their lower ends, the roof sections 70 are provided with pendent eave planks 72 with convexly rounded strips 73 at their inner sides to hingedly interlock with the concaved strips 48 on the outer faces of the side wall sections 24 along the top edges of the latter. The roof sections 70 are moreover recessed at the inner sides adjacent their bottom ends as at 74 to fit over shoulders 75 on the outer ends of the attic floor sections 50, with the result that, after assembling, said roof sections are securely locked against displacement with respect to both

the side wall sections 24 and said attic floor sections as clearly shown in Fig. 2. The gable sections 61 and the endmost roof sections 70 are locked together along the regions of mutual abutment by double dove tail keys indicated at 76 in Figs. 3 and 8.

The ridge of the roof is formed by a key 77 which, as seen in Fig. 3, has complementally inclined longitudinal grooves 78 to engage the upper edges of the sections 70 composing the oppositely sloped sides of the roof, and which, in assembling, is run in endwise and which preferably extends the full length of the building. In the present instance, the upper ends of the roof sections 70 are marginally reduced in thickness as at 79 so that the outer faces of the ridge bar 77 may be flush with the outer faces of said sections, as shown.

For the purpose of subdividing the interior of the building into rooms, I have provided hollow partition sections, such as the one shown at 80 in Fig. 2, having longitudinal grooves 81 and 82 in their bottom and top edges. The bottom edge of each partition section is engaged over a locating strip 83 fastened to the floor, and the upper edge engaged with the pendent longitudinal tongue 84 of a grooved key 85 which is in turn engaged with a locating strip 86 on the ceiling boards 54 of the upper floor sections 50, the key being of course run into place endwise subsequent to erection of the partition over the strip 83.

The various components of the building are assembled in the order in which they have been described, and a separate explanation of the procedure is therefore deemed to be unnecessary.

In the modified embodiment illustrated in Fig. 12, the attic is provided with side wall partitions 90 and a ceiling 91 which, it is to be understood, are constituted by multiple prefabricated sections sinally arranged lengthwise of the building and keyed together along mutually abutting edges. As shown, the partitions 90 are interlocked top and bottom with the roof sections 70*a* and with the upper floor sections 50 by means of keys 92, 93, and the ceiling 91 with said roof sections by means of keys 94, said keys being all similar to those described in connection with the first described embodiment. By reason of this construction, the partition and ceiling sections in effect become truss or bracing members capable of acting either in tension or compression as may be necessary to assist in the proportional distribution of stresses or strains occasioned locally in any part of the building through wind pressure, floor loading, or from any other cause. In order to preclude the necessity for repetitive description, all other elements of the modified construction not specifically referred to but having their counterparts in the first described form of my invention, are identified by the same reference numerals previously used with addition in each instance of the letter "*a*" for convenience of better distinction.

From the foregoing it will be seen that the various component sections of the building in both illustrated embodiments are so interlocked that the stresses and strains to which any one of them may be directly subjected are effectively transmitted to and proportionately shared by the other parts throughout the completed structure. Due to the double dove-tail cross sectional configuration of the various keys and keyways, the joints formed by them are resistive to the passage of either air or water through them. It will be further apparent that the improved system of interlocking joints which I have devised is highly advantageous in that it does away with the necessity for the use of nails or screws; in that it makes possible the more rapid assembling and erection of the various component sections; and in that it favors lighter construction of the sections with corresponding saving in the amount of material required in their fabrication. The various component parts need not necessarily be pieced together from lumber as herein conventionally shown by way of example, but, if desired, may be fashioned from metal by casting, rolling or extrusion, or even molded from concrete or plastic materials as integral units, with incidental incorporation of my novel interlocking features as suggested in Fig. 12.

By suitable modifications within the scope of the appended claims, it is of course feasible to construct buildings different in design from the one herein shown by way of example having other than rectangular floor plans as well as additional upper stories.

Having thus described my invention, I claim:

1. A building comprising a ground floor; prefabricated side and end walls with locking hinge means along their bottom edges connected with corresponding edges of the ground floor, the vertical edges of said side and end walls being beveled and meeting in miter joints at the corners of the building and being provided with longitudinally-extending complemental undercut grooves; and continuous cross sectionally-conformative locking keys engaging the complemental grooves in the meeting edges of the side and end walls at corners.

2. A building according to claim 1, in which the side walls are hollow and filled with thermal insulation.

3. A building according to claim 1, wherein the side walls are composed of aligned multiple upright sections with complemental undercut grooves in their mutually abutting vertical edges; and further including continuous cross sectionally conformative supplemental locking keys engaged in the latter grooves.

4. A gable ended building comprising a ground floor; side and end walls connected at their bottom edges to corresponding edges of the floor and having upstanding tongue projections along their top edges; a prefabricated rectangular upper floor having grooves in its bottom adjacent its edges in engagement with the upstanding tongue projections at the tops of the side and end walls, opposite ends of said upper floor being complementally sloped to conform with the gable angle; prefabricated roof sides connected by hinge means along their bottom edges with the upper edges of opposite side walls and with the corresponding ends of the upper floor; and a locking ridge member in the form of a continuous key having oppositely inclined grooves engaged with the top edges of the roof sides.

5. A building comprising a ground floor; side and end walls connected at their bottom edges to corresponding edges of the floor and having upstanding tongue projections along their top edges; a prefabricated rectangular upper floor having grooves in its bottom adjacent its edges to engagement with the upstanding tongue projections at the tops of the side and end walls, opposite ends of said upper floor being complementally sloped to conform with the gable angle; prefabricated roof sides with locking hinge means along their bottom edges connecting the

upper edges of opposite side walls and with the corresponding ends of the upper floor; a ridge member in the form of a continuous locking key having oppositely inclined grooves in engagement with the upper edges of the roof sides; triangular gable end sections connected by hinge means along their bottom edges to the corresponding edges of the upper floor and having complemental undercut grooves respectively along their sloping edges; and continuous cross sectionally conformative locking keys engaging the grooves along the meeting edges of the roof sides and the gable sections.

EDWARD P. SIMON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,023,066	Curtis et al.	Dec. 3, 1935
2,026,650	Onsrud	Jan. 7, 1936
2,139,623	Marston	Dec. 6, 1938
2,204,675	Grunert	June 18, 1940
2,252,568	Hulslander	Aug. 12, 1941
2,321,567	Wilson	June 15, 1943
2,342,264	Fuehrer	Feb. 22, 1944
2,345,018	Teague et al.	Mar. 28, 1944
2,362,162	Sheldon	Nov. 7, 1944
2,363,233	Dalton, 2d	Nov. 21, 1944
2,363,405	Eichelberger	Nov. 21, 1944
2,371,300	Kaufman	Mar. 13, 1945
2,386,588	Brunton et al.	Oct. 9, 1945

FOREIGN PATENTS

Number	Country	Date
53,968	Sweden	1921