E. P. GARNER.

BUILDING CONSTRUCTION.

APPLICATION FILED FEB. 13, 1919.

1,345,164. **Patented June 29, 1920.**

5 SHEETS—SHEET 1.

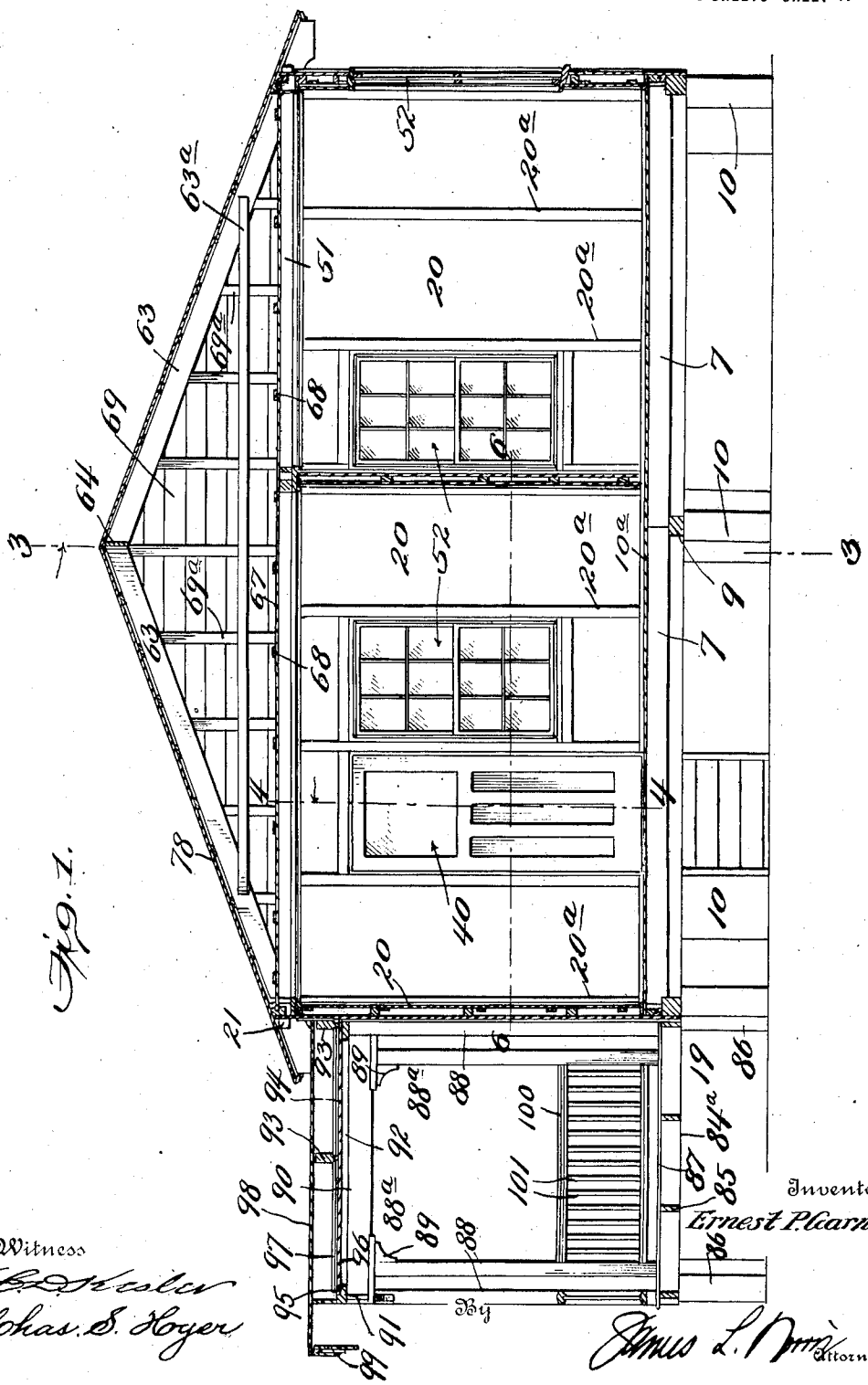


Fig. 1.

Witness
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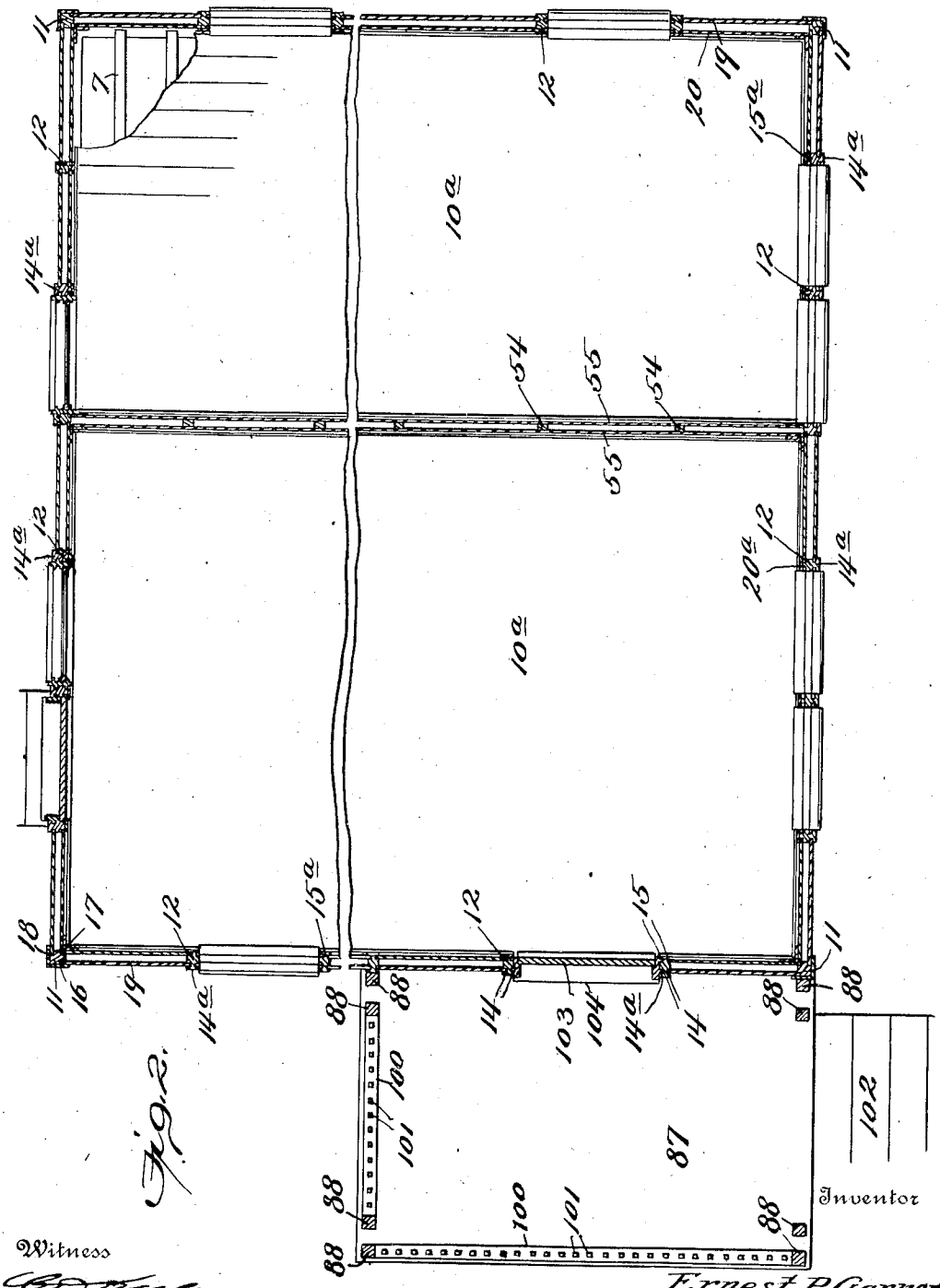


Fig. 2.

Witness

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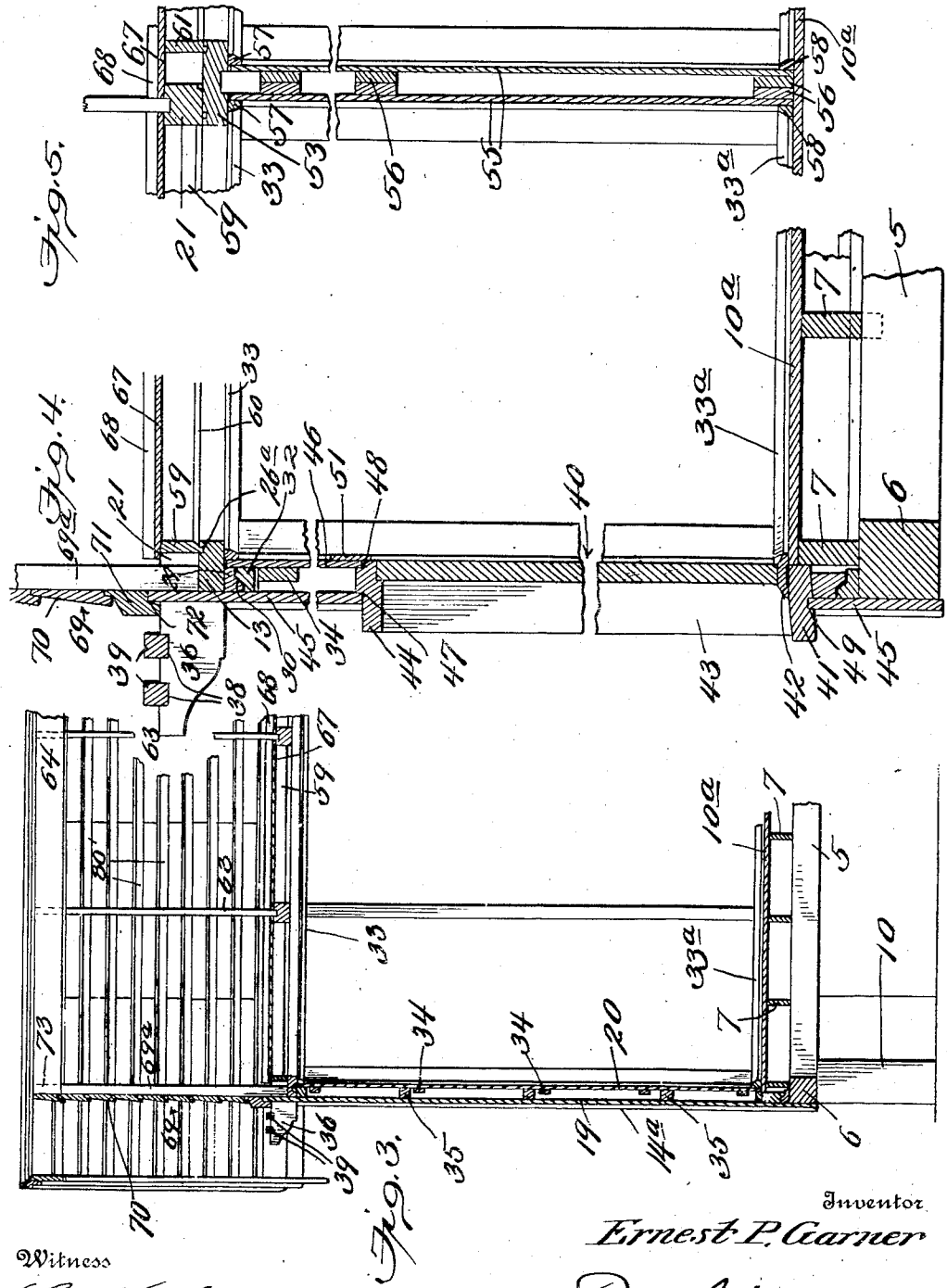


Fig. 5.

Fig. 4.

Fig. 3.

Witness

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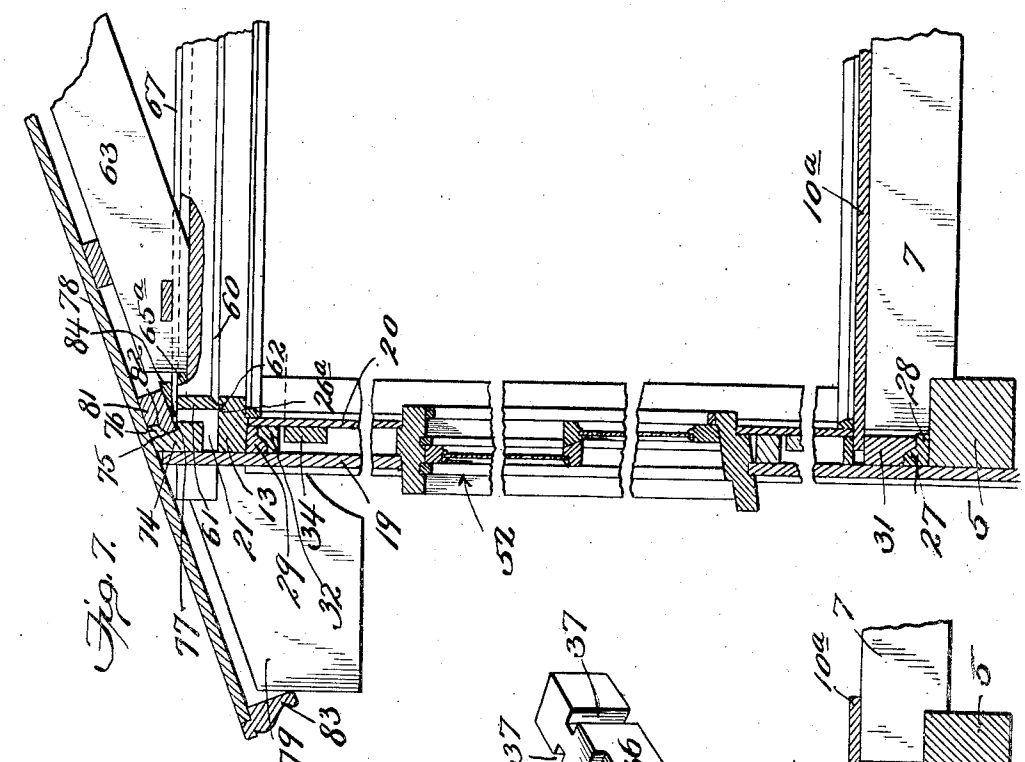


Fig. 7.

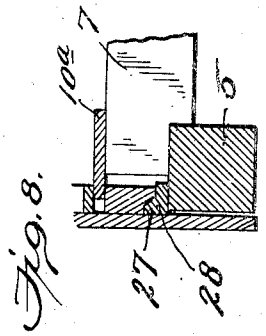


Fig. 8.

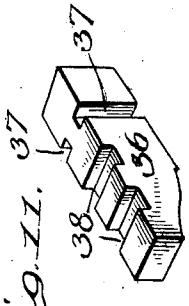


Fig. 11.

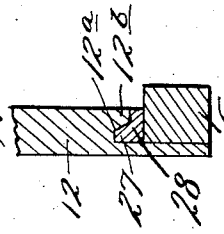


Fig. 12.

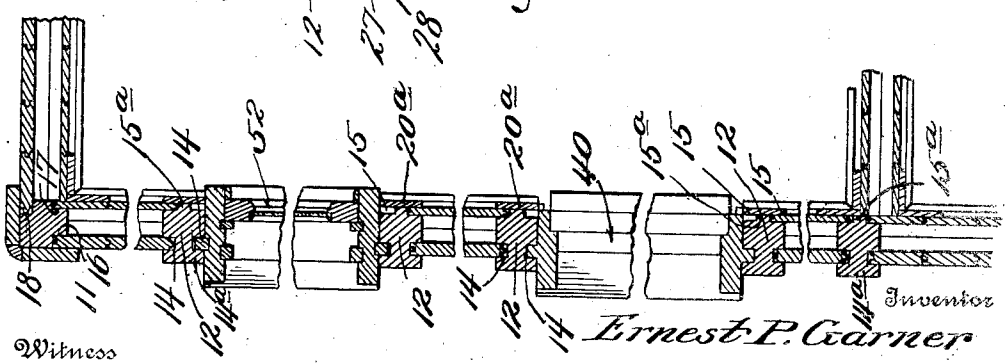


Fig. 6.

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5 SHEETS—SHEET 5.

Fig. 10.

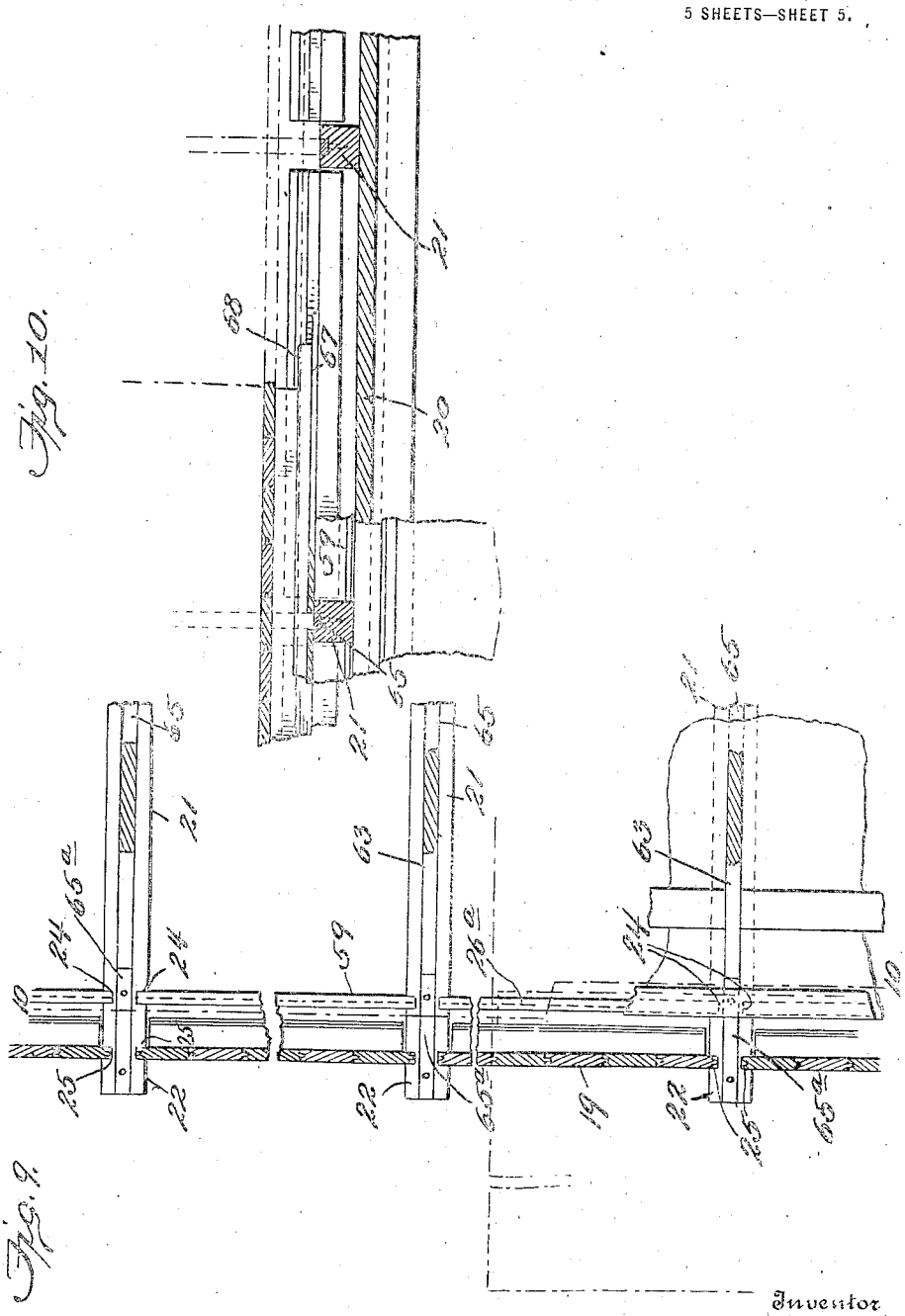


Fig. 9.

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UNITED STATES PATENT OFFICE.

ERNEST P. GARNER, OF CHARLESTON, SOUTH CAROLINA.

BUILDING CONSTRUCTION.

1,345,164. Specification of Letters Patent. Patented June 29, 1920.

Application filed February 13, 1919. Serial No. 276,853.

To all whom it may concern:

Be it known that I, ERNEST P. GARNER, a citizen of the United States, residing at Charleston, in the county of Charleston and State of South Carolina, have invented new and useful Improvements in Building Construction, of which the following is a specification.

This invention relates to building construction and has particular reference to portable bungalows though adapted equally well in many features to general wooden building structures.

The primary object of the invention is to facilitate the construction of wooden buildings of variable dimensions by preparing the several parts in such condition that they may be readily assembled by any person with ordinary intelligence, whether a carpenter or not, without requiring cutting, sizing or fitting the previously-constructed parts or units at the place of erection, and which, if desired, may be separated and reassembled and whereby a wooden bungalow cottage, or other larger building, may be shipped conveniently or transported from one location to another.

A further object of the invention is the production of a knockdown or portable wooden building wherein the several sections, parts or units are preliminarily prepared in such manner that they may be joined securely by the use of materially less nails or other fastenings than are required in ordinary similar building structures.

A further object of the invention is to produce a strong and durable wooden building which will be interiorly dry and afford ample protection against severe weather conditions, and also with such structural features as to provide for a neat interior finish and comfortable dwelling equipment or conveniences by way of space divisions or rooms, as well as an exterior symmetrical and artistic appearance.

A still further object of the invention is to provide a structure composed of units manufactured prior to the time of erection and readily assembled to form garages, tool and farm out houses, granaries, and toy houses.

With these and other objects and advantages in view, the invention consists in the preferred construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the drawings:—

Figure 1 is a longitudinal vertical sectional view of a bungalow embodying the features of the invention.

Fig. 2 is a sectional plan view of the bungalow.

Fig. 3 is a transverse vertical section of a portion of the bungalow showing the one end wall taken on the line 3—3, Fig. 1.

Fig. 4 is an enlarged transverse broken section through one end wall and door, taken on the line 4—4, Fig. 1.

Fig. 5 is an enlarged transverse broken section particularly showing one of the partitions that will be used in dividing the interior of the bungalow.

Fig. 6 is an enlarged horizontal broken section through one corner and window and door jambs and portions of one side and partition, taken on the line 6—6, Fig. 1.

Fig. 7 is an enlarged section through the front side wall and portions of the floor and roof of the bungalow and showing a window jamb and roof extension and verge board.

Fig. 8 is a detail transverse sectional view of one of the sills, a portion of an outer panel and of the floor and a part of an intersecting sill in side elevation, and showing a tongue locking piece or strip arranged to compensate for a crooked sill.

Fig. 9 is a horizontal section through the upper part of a portion of one wall and roof structure.

Fig. 10 is a section taken in the plane of the line 10—10, Fig. 9.

Fig. 11 is a detail perspective view of one of the gable end brackets.

Fig. 12 is a detail transverse sectional view on an enlarged scale showing a part of one of the sills and studs to illustrate the interlocking relation thereof.

The numerals 5 and 6 designate the side and end sills, and 7 the floor joists, the latter being formed in part lengths relatively to the floor width and fitted and secured between the side sills and to a central sill 9 as shown by Fig. 1. The sills 5, 6 and 9 are supported on piers 10 erected at desired intervals and formed of brick or other material such as concrete. These sills serve to support a floor 10^a and the entire superstructure of the bungalow, and extending upwardly therefrom are corner posts 11 and wall studs 12 between said posts. The corner posts and studs 11 and 12 support wall plates 13, and each stud is formed

with opposite side grooves or rabbets 14 and 15 and with lower inner recesses 12^a to permit the studs to extend downwardly over the full width of the sills 5 and 6, said recesses being under cut at the inner lower terminal portions of the studs to form tongues 12^b, see Fig. 12. The pairs of outer opposing grooves or rabbets 14 are wider than the inner pairs of grooves or rabbets 15, the latter being adjacent to and reducing the width of the inner edges of the studs to form space closures 15^a. The grooves or rabbets 14 are formed at distances inwardly from the outer sides of the studs so that the latter provide outer end joint closures 14^a, or, have overlapping joint members due to the groove or rabbet formation just specified for a purpose which will be presently explained. The corner posts each have two grooves or rabbets 16 and 17 in the one inner side of each, the groove or rabbet 17 being narrower than the groove or rabbet 16, and in the remaining inner side a single groove 18 is formed. The grooves or rabbets 14 of the studs 12 and grooves or rabbets 16 and 18 of the corner posts 11 receive the side edges of outer side and end panels 19 which project above the plates 13 and downwardly over and terminate flush with the lower side edges of the sills, and the grooves or rabbets 15 of the studs 12 and grooves or rabbets 17 of the corner posts receive the edges of inner panels 20, the space closures 15^a at the inner sides of the studs fitting closely between the side edges of the said inner panels, the said outer and inner panels forming substantially hollow walls at the opposite sides and ends of the bungalow. Cover strips 20^a are also provided and applied over the contiguous edges of the inner panels 20 and secured against the space closures 15^a of the studs. The lower ends of the outer panels 19 are coincident with the lower sides of the sills 5 and 6, the said panels extending over the outer sides and above the plates. Ceiling joists 21 are laid upon and supported by the front and rear plates 13, these joists being of greater length than the distance between the front and rear walls of the building or bungalow to provide projecting keying extremities 22 which may have their outer ends suitably finished. The keying extremities 22 of the joists 21 are each formed with inner and outer pairs of vertical grooves 24 and 25 in opposite sides thereof, the inner pairs of grooves 24 alining with upper grooves 26^a near the inner edges of the front and rear plates 13, and the outer pairs of grooves 25 being in position for engagement by the edges of the upper extremities of the outer front and rear side wall panels, as shown by Figs. 9 and 10. The studs 12 have their upper ends terminating at and secured by any suitable means against the under sides of the plates 13 and the lower tongues 12^b thereof fitted over upper beveled tongues 27 of pieces or strips 28 secured on the upper sides of the sills 5 and 6, one on each sill, as shown by Figs. 7 and 8. The use of these tongue pieces or strips is very advantageous in that a straight wall will always be insured irrespective of whether or not the sill is straight, each piece or strip being primarily adjusted and set straight and all the pieces or strips properly alined and secured, and if the sill is crooked a primary adjustment of the pieces or strips may be readily effected to overcome the irregularity of the sill, as shown by Fig. 8. Furthermore, grooving the sill is avoided and formation of water receiving crevices is thereby prevented and decay materially obviated. It is also well known that where timber is grooved an internal crack or fracture is apt to form laterally from the groove, and this weakening feature of the sill is also avoided by using the tongue piece or strip 28.

The under sides of the plates near the outer sides thereof are likewise provided with pieces or strips 29 similar to the pieces or strips 28 and having depending tongues 30. There will be a number of these pieces 28 and 29 between the studs 12 and the latter will be braced by said pieces. Each outer panel 19 has lower and upper locking battens or cleats 31 and 32 extending transversely over the inner side thereof, the lower batten or cleat 31 being a distance upwardly thereon from the lower end of the panel sufficient to permit the desired dependence of the panel over the outer side of the adjacent sill and engages over and snugly fits the tongue 27 of the piece or strip 28 adjacent thereto. The upper batten or cleat 32 is a distance downwardly from the upper end of the panel sufficient to permit the upper extremity of the panel to extend over and cover the adjacent plate 13 and engages the tongue 30 of the adjacent piece or strip 29. All of the other panels are similarly applied between the corner posts 11 and may be readily set up and secured without the use of nails, screws or bolts to provide an advantageous outer wall closure for the bungalow or building. The inner panels 20 have their lower ends set closely on the floor 10^a, and those between the corner posts 11 have their side edges fitted in the inner pair of grooves 15 of the studs 12 and extend upwardly to the plates 13, a finishing molding strip 33 being secured over the upper ends of the inner panels and against the lower sides of the said plates. A lower finishing molding 33^a is also secured against the floor 10^a and lower ends of the inner panels 20.

The space closures 15^a of the studs are exposed between the side edges of the inner panels 20 and the inner wall is completed by securing the cover strips 20^a closely against

the closures 15ª and over the adjacent joints between the side edges of the panels 20 and the studs. The inner panels 20 also have cross battens 34 at intervals on their outer sides to strengthen them and prevent warping thereof, and between the inner and outer panels air checks 35 are interposed at intervals, said checks also acting to reinforce the complete wall structure. The side edges of the outer and inner panels 19 and 20 adjacent to the corner posts 11 are fitted in the grooves or rabbets 16, 17 and 18, the inner panel side edges at the front and rear ends of the building abutting against the side edge portions of the inner panels of the building sides fitted in the grooves 17 of said corner posts.

Above the upper ends of the studs 12 the spaces between the side edges of the outer panels 19 at the front and rear sides of the building are engaged and closed by the keying extremities 22 of the ceiling joists 21, the side edges of the panels fitting in and firmly held by the outer vertical grooves 25. At the ends of the bungalow or building, as shown by Figs. 3 and 4, gable brackets 36 are placed and held on the upper surfaces of the plates 13 along the end walls, and each is of the shape shown in detail by Fig. 11 and formed with a pair of vertical side grooves 37 near the inner end to receive the side edges of the upper extremities of the outer end wall panels 19. The major part of each bracket 36 projects outwardly beyond the outer surfaces of panels 19, and the upper side thereof is provided with parallel mortises 38 extending transversely thereover and having tie strips 39 secured therein, said latter strips also giving the upper portions of the bungalow ends a neat finish and appearance.

Wherever a door 40 is set in either end or side wall, or both walls, the frame of the door, comprising a threshold 41 having a sill 42 thereon, side uprights 43 and a head 44, is fitted in between the studs 12 at the point or points desired and the full length inner panels 19 and 20 are replaced by upper and lower shorter panels 45 and 46 also disposed between the studs 12 as hereinbefore described and respectively in outer and inner seats or grooves 47 and 48 in the head 44, and in a groove 49 in the lower side of the threshold 41. A facing strip 51 is secured over the joint between the lower end of the upper short inner panel 46 and the head 44. Likewise, windows and window frames 52 may be inserted in the side and end walls either singly or in double form as shown, and the outer and inner panels will be shortened in length above and below the window frames and fitted into parts of the latter and the joints finished in a manner similar to applying and securing the door frames in place.

The interior space of the bungalow may be divided as desired in any number of rooms by suitable partition structures or walls, one of which is shown in Figs. 1, 2 and 5, and in these partition structures or walls door-frames and doors may be introduced wherever desired to form ready means of communication between adjoining rooms. Each partition structure or wall essentially comprises an upper partition plate 53 terminally secured to opposing wall plates 13 with a series of partition studs 54 extending therefrom to the floor 10ª. Wall panels 55 are applied to opposite sides of the studs 54, the stud and panel arrangement of the partition structure being similar to the inner sides of the studs 12 and inner panels 20 and have cover strips 55ª secured over the side edge joints. The panels 55 are provided with inner cross battens 56 in abutting adjacency to brace and solidify the partition wall structure and also to in a measure form air checks. The ceiling and floor finishing moldings 33 and 33ª are continued as at 57 and 58 over the upper and lower end joints of the panels 55 and respectively secured to the partition plate 53 and floor 10ª. The plate 53 is so disposed that one side edge thereof is coincident with the one side of the ceiling joist 21 against which the plate is applied, and said plate is greater in width than the joist and projects to one side of the latter, and also is greater in width than the maximum width of the partition whereby the plate has a cap appearance relatively to the partition. Around the interior of the upper part of the bungalow ceiling fascia or facing strips 59 extend upwardly from the wall plates 13 and are formed with lower molding edges 60 to give them an ornamental appearance. A similar fascia or facing strip 61 is applied also to the partition plate 53 adjacent to the side edge opposite that with which the ceiling joist 21 coincides. The fascia or facing strips 59 at the front and rear walls are between the ceiling joists 21 and terminally engage the inner pairs of grooves 24 of the keying extremities 23 of said joists, the lower edges of said fascia or strips 59 engaging the grooves 26ª of the adjacent wall plates 13. The side wall plates 13 have their upper sides similarly grooved as at 62 to receive the lower edges of the side wall fascia or facing strip 61 which may be of longer lengths than those applied to the end walls.

The ceiling and roof structure comprise a plurality of intermediate roof rafters 63 running upwardly at an incline and secured to a ridge strip or piece 64, the lower ends of said rafters being beveled and located adjacent to the inner grooves 24 of the keying extremities 23 of the ceiling joists 21 and fitted in central grooves 65 extending longitudinally of the said joists.

In the end portions of the grooves 65 blocks 65ª are secured and provide stops for the ends of the rafters 63, and when the roof structure is completed as hereinafter specified, it will be impossible for the said rafters to be lifted or become loose or in anywise displaced. The rafters 63 are of a thickness materially less than the width of the joists 21 and opposite ledges 66 are thus formed between the rafters and provide clearance and supports for ceiling panels 67 having battens 68 thereacross at intervals to strengthen and prevent warping thereof. The fascia or facing strips 59 and 61 have their upper edges in close contact with the lower sides of the ceiling panels 67 and provide an additional support for the latter as well as a neat finish. The roof also includes gable ends 69 each composed of triangular gable panels 70 preferably made of weather boarding and having a water table 71 extending full length of and depending below the lower edge thereof, the table 71 having a channel or rabbet 72 in the inner portion of the lower edge to receive the upper ends of the outer panels 19 of the end walls to provide an overlapping protective covering for said panel ends and to close the spaces between the side edges of the panels above the upper surfaces of the gable brackets 36.

Along the upper reverse angular edges and at the inner side of each panel, rafters 73 are secured and terminate flush with the ends of the panel, these rafters at their upper ends being attached to and abutting against the ends of the ridge strip or piece 64. In connection with the gable ends the rafters 73 also provide means for supporting the top cover of the roof. As a reinforcing means, tie or collar beams 63ª are secured to the rafters 63, as shown by Fig. 1. The outer wall panels 19 of the side walls of the bungalow are each provided with a roof retaining cleat 74 on the inner side of the upper end thereof, said cleat projecting above the upper end of the panel and having an inner locking groove 75 near its upper edge, the latter edge being beveled as at 76 to correspond to the slope of the adjacent rafters. Secured to and extending vertically over the inner side of each gable panel from the rafters 73 an equal distance below the lower edge of the said panel are a plurality of gable studs 69ª which terminally engage and bear upon the adjacent wall plate 13, the lower depending portions of the studs 69ª being of such length that when they engage the plate 13 the water table 71 will be in full association with the upper ends of the adjacent outer panels 19. Before the top covering structure of the roof is applied, the ceiling panels 67 are placed in position on the ceiling joists 21, these panels terminating a short distance at each of their ends from the cleats 74 and whereby key spaces 77 are formed for a purpose which will be hereinafter specified. The roof covering consists of roof panels 78 having their upper ends secured to the ridge strip or piece 64 and extending downwardly over the rafters 63 and 73 and beyond the side walls of the bungalow to a considerable extent to overhang or form eaves, and along the outer edges of the said panels 78 verge boards 79 are secured. The roof panels 78 are placed centrally over the rafters 63 as shown by Fig. 3 and engage rafter strips 80 extending transversely over and secured to the rafters 63 and 73, and near their lower ends said roof panels are also provided on the lower sides with transversely extending locking battens or strips 81 having the outer edges thereof formed with beveled grooves 82 to fit and tightly interlock with the grooves 75 of the outer panel cleats 74. The locking battens or strips 81 each extends one half its length each way and engages two locking cleats 74 at the upper portions of two of the outside panels 19, whereby each roof panel engages or interlocks with two of the said panels and conversely two side panels interlock with each roof panel. Moreover, the locking battens or strips 81 extend over and engage the ceiling joists 21 and prevent the latter being lifted by wind or other cause.

The roof is finished by securing a crown molding 83 to each end over the verge boards 79. In the key spaces 77 key strips 84, wedge-spaced in cross-section, are inserted after the ceiling and roof panels have been placed and locked and engage and lock over the ends of the ceiling panels 67 and hold the latter panels firmly against movement, and also engage the locking battens or strips 81 of the roof panels 78 and prevent said strips or battens from becoming disengaged from the panel cleats 74, and by this means the roof structure as a whole is firmly secured in place with a strong resistance against the force of the natural elements. In fact, the key strips force down and lock all parts adjacent thereto against loose movement or displacement.

In addition to the general structural features hereinbefore described, the bungalow may be provided with a porch comprising a floor frame 84ª embodying joists 85 supported by piers or pedestals 86 and having a floor covering 87. On the floor covering 87 adjacent to the corners thereof columns 88 are mounted and extend upwardly therefrom any distance desired, but preferably such distance as to have the maximum height of the porch less than the dependence of the eave or overhanging edge of the bungalow roof covering or roof panels, and thereby permit the porch roof to extend under the roof eave. Caps 88ª are mounted and secured on the upper ends of the col-

umns 88 and on cap brackets 89 attached to the columns, and on the caps a porch box or roof supporting frame 90 is disposed and suitably fastened. Side and end plates 91 and 92 are superimposed on the box or frame 90, and from the end plates 92 porch roof rafters 93 having upper inclined edges reversely extending upwardly toward the vertical centers thereof, ceiling panels 94 being laid and secured on the plates 91 and 92 and having their side edges engaging rabbets 95 formed in the intermediate and innermost rafters 93 and also engaging rabbets 96 in the plates. The ceiling panels 94 have cross battens 97 on their upper sides to strengthen them and prevent warping thereof, and said panels may be easily applied to the plates 91 and 92 to form a flat ceiling that may have any desirable finish or ornamentation. Laid over and secured on the rafters 93 are roof panels 98 which in part project outwardly beyond the outer side of the roof frame, as shown by Fig. 1, and have an ornamental verge board 99 secured thereto. At the sides and one end of the porch between the columns 88 rails 100 are mounted and have vertical palings 101 disposed therein, as shown, to provide porch guards, the opposite end of the porch being open and having steps 102 leading thereto from the ground surface or walk, the parts of the porch, as just explained, being secured to each other and to the adjacent portions of the building by any suitable means. A front door 103, mounted as hereinbefore described, with a suitable threshold or sill 104 gives ingress and egress to and from the interior of the bungalow relatively to the porch.

The foregoing parts may be assembled in the bungalow structure to the best advantage to economize expense and time in erection and placement. All the parts will be completed at some point of manufacture and delivered with an instruction specification that will enable an unskilled laborer or laborers to erect the bungalow, thereby materially reducing the cost of bungalow or general building structures embodying the features herein explained. Any size of building may be produced by correspondingly shaping the dimensions and proportions of the several structural parts.

What is claimed is:—

1. A building comprising sills with tongued strips on the upper sides thereof, joists engaging the sills and having a floor laid thereon, studs rising from the sills and having lower grooved ends fitted over the said tongued strips, wall plates mounted over and engaging the studs and provided with lower groove means, outer and inner wall panels between the studs, the outer panels having lower and upper grooved cleats to interlock with the tongued strips of the sills and groove means of said plates, the lower extremities of the outer panels covering the outer sides of the sills, and a roof structure mounted over the sills.

2. A building comprising sills with tongued strips on the upper sides thereof, joists engaging the sills and havin[illegible] floor laid thereon, studs rising from the sills and provided with outer and inner grooves and provided with means at their lower ends to fit over and interlock with strips of the sills and also depend over the outer sides of the sills, wall plates mounted over and engaging the studs and provided with groove means at their lower sides, outer and inner wall panels between and engaging the grooves of the studs, the outer panels having their lower portions extending over the outer sides of the sills between the depending portions of the studs and the outer panels having lower and upper grooved cleats to interlock with the tongued strips of the sills and groove means of said plates, and a roof structure mounted over the plates.

3. A building comprising sills and upper plates, joists engaging the sills and having a floor laid thereon, studs rising from the sills and having a slot in the lower inner portion of their ends to provide for dependence of the studs fully over the outer sides of the sills and to engage over upper edge portions of the sills, the studs also having outer and inner pairs of grooves in the opposite sides thereof, outer and inner wall panels between and engaging the grooves of the studs, the outer panels extending over and covering the outer sides of the sills between the depending parts of the studs, means provided on the outer wall panels and the sills and plates for setting up an interlock between said panels, studs, sills and plates, and a roof structure mounted over the plates and provided with panels extending over and engaging the upper edges of a part of the outer wall panels, the latter panels and roof panels having separable interlocking grooved devices.

4. A building comprising sills with tongued strips on the upper sides thereof, joists engaging the sills and having a floor laid thereon, corner posts rising from the sills and provided with grooves in opposite sides thereof, studs also rising from the sills and having grooves in the opposite sides of the same and also provided with lower slotted terminals to engage the tongued strips of the sills and form portions to depend fully over the outer sides of the sills, wall plates mounted over and engaging the studs and provided with groove means at their lower sides, outer and inner wall panels between the studs and engaging the grooves of the latter and the grooves of the corner posts and having their lower extremities extending over the outer sides of the sills between the depending portions of the studs,

the outer panels having lower and upper grooved cleats to interlock with the tongued strips of the sills and plates, and a roof structure mounted over the groove means of plates.

5. A building comprising sills with grooved strips thereon, studs and corner posts rising from the sills and having outer and inner grooves in the opposite sides thereof, the outer grooves of the studs being located at a distance inwardly from the outer edges of the same, plates supported on the studs and having groove means, wall panels having grooved cleats engaging over the grooved strips of the sills and also engaging the groove means of the plates, the panels having their side edges fitted in the outer grooves of the studs and the joints between them covered by the outer projecting portions of the studs beyond the grooves therein, the lower extremities of the panels extending fully over the outer side portions of the sills, and a roof structure mounted over the plates and having portions thereof separably interlocked with a part of the wall panels.

6. A building comprising a lower frame structure having sills with grooved strips thereon, studs rising from the sills and provided with outer grooves in the opposing sides thereof at distances inwardly from the outer edges of the studs, plates mounted on the studs, wall panels having cleats engaging the grooved strips of the sills of the lower frame structure and the plates, the side edges of the panels engaging the grooves of the studs, the joints of the panels being closed by the outer projecting portions of the studs and the lower extremities of the latter being slotted to fit over portions of the sills to form pendants, the lower outer pendants of the studs and also the lower extremities of the panels extending fully over and covering the outer sides of the lower frame structure, and a roof structure mounted over the plates.

7. A building comprising a lower frame structure including sills having grooved strips on the upper sides thereof, and studs and corner posts rising from the sills, the studs having inner portions of the lower extremities thereof slotted to form pendants which extend downwardly over the outer sides of the sills, the studs also provided with outer pairs of grooves at distances inwardly from the outer edges thereof and also with inner pairs of grooves opening through the inner edges thereof, plates mounted upon the studs, outer wall panels disposed between the corner posts and the studs having their side edges engaging the outer grooves of said studs and whereby the joints between them are covered by the outer edges of the studs, the outer panels having cleats on the inner sides respectively engaging the strips on the sills and the plates for holding the panels in place, inner wall panels engaging the inner grooves of the studs and the corner posts, the lower extremities of the outer panels extending fully over the outer side portions of the sills, and a roof structure mounted over the plates.

8. A building comprising lower and upper frame structures, studs and corner posts mounted between and engaging the said structures, the studs having outer lower pendant portions to extend fully over the outer sides of parts of the lower frame structure and also provided with outer and inner pairs of grooves in opposing side edges thereof, the outer grooves being located inwardly a distance from the outer edges of the studs to provide joint closures at the outer portions of the studs, the lower pendant portions of the studs also extending fully over the outer sides of the lower frame structure, outer wall panels engaging the corner posts and the outer grooves in the studs and also depending over the outer sides of the lower frame structure and extending over the similar sides of the upper frame structure and having separable interlocking relation to the latter, inner wall panels engaging the inner grooves of the studs and the corner posts, cover strips applied over the joints between the inner wall panels and the studs, and a roof structure mounted over the upper frame structure and having wall panels extending over and engaging the upper ends of a part of the outer wall panels, the upper extremities of the outer wall panels and the lower extremities of the roof panels having grooved interlocking means at the inner sides thereof.

9. A building comprising a lower frame structure including sills, tongued strips mounted on the upper sides of the sills and adjustable to compensate for crookedness of the sills to provide a straight alinement of the tongued strips, corner posts and studs rising from the sills, wall plates mounted over and engaging the studs and provided with groove means at their lower sides, outer wall panels having lower and upper grooved cleats to engage the tongued strips of the sills and the groove means of the plates and also fitted between the corner posts and the studs and having their joints covered by portions of the studs, inner wall panels applied to the studs and corner posts, cover strips over the joints between the inner wall panels and studs, and a roof structure mounted over the plates.

10. A building comprising a lower frame structure including sills having locking means on the upper sides thereof, an upper frame structure provided with locking receptive means at the lower portion thereof,

corner posts and studs disposed between the said lower and upper frame structures, wall panels applied over the said frame structures and having their opposite extremities covering the latter structures, the wall panels of two opposing walls of the building being provided with grooved locking devices on their inner sides to engage the sills and the upper frame structure and also with top grooved locking devices extending above the upper edges thereof, and a roof structure mounted over the upper frame structure comprising roof panels extending over and bearing upon the upper edges of the said wall panels and having locking devices on their lower sides to engage the grooved locking devices extending above the upper ends of the wall panels.

11. A building comprising lower and upper frames with studs and corner posts interposed between the same, wall panels applied to the said frames and extending at opposite extremities over the outer sides of the frames, the wall panels at two of the opposing sides of the building having grooved locking devices extending transversely thereover at their inner sides and disposed to engage parts of the lower and upper frames and also to project above the upper ends of the said panels, ceiling panels mounted over the upper frame structure and removably held on the latter, and a roof structure embodying roof panels extending over the upper edges of the said wall panels and having grooved locking devices on their lower sides to engage the locking devices extending above the upper ends of the wall panels.

12. A building comprising lower and upper frames with studs and corner posts interposed between the same, wall panels applied to the said structures, the wall panels at two of the opposing sides of the building having locking devices at the inner portions of the upper ends thereof above the upper frame structure, the said locking devices projecting above the upper ends of the panels and having grooves formed therein, ceiling panels mounted over the upper frame structure, a roof structure embodying roof panels having lower grooves of the locking devices to engage the locking devices at the upper ends of the said two opposing walls of the building, the ends of the ceiling panels being below and adjacent to the locking devices of the roof panels, and key devices introduced between the said locking devices and over the ceiling joists and the ceiling panel ends.

13. A knockdown building comprising a lower frame structure, an upper frame structure, separable studs and corner posts interposed between the lower and upper frame structures, ceiling joists separably mounted on the upper frame structure and having central grooves extending longitudinally thereof, wall panels separably applied to the studs and corner posts and over the lower and upper frame structures, ceiling panels removably held on the upper edges of the ceiling joists at opposite sides of the grooves in the latter, and a roof structure embodying rafters having their lower ends fitted in the grooves of the ceiling joists and also provided with roof panels extending over the upper edges of the said wall panels, detachable locking means being provided on the wall and roof panels and between the locking means of the roof panels and the ceiling panels.

14. A knockdown building comprising a lower frame structure, an upper frame structure, studs and corner posts interposed between the lower and upper frame structures, ceiling joists mounted on the upper frame structure and having central grooves extending longitudinally of the upper sides of the same, wall panels applied to the studs and corner posts and over the lower and upper frame structures, the wall panels at two opposing wall portions of the building having locking devices at the inner sides of the upper ends thereof above the upper frame structure, a roof structure embodying rafters having their lower ends fitted in the grooves of the ceiling joists and also provided with roof panels having locking devices on the lower sides thereof to engage the locking devices of the said panels of the opposing wall portions of the building, the central rafter end receiving grooves in the ceiling joists providing for the formation of ledges at the opposite sides of the grooves, ceiling panels loosely disposed on said ledges and held between the rafters, and key locking devices introduced between the locking devices of the wall and roof panels and over the ceiling joists and the ends of the ceiling panels.

15. A knockdown building comprising lower and upper frame structures, corner posts and studs introduced between the lower and upper frame structures, ceiling joists mounted on the upper frame structure and having their opposite extremities projected outwardly beyond the same and formed with inner and outer pairs of vertical grooves, the said ceiling joists also having longitudinal grooves at their upper sides, wall panels applied to the lower and upper frame structures between the studs and corner posts, the ceiling joists extending between a portion of those panels which engage the outer pairs of grooves of said joists, ceiling panels bearing upon the ceiling joists at the opposite sides of the centers of the latter and having their ends projecting over portions of the members of the upper frame structure, a roof structure embodying rafters with their lower ends fitted in the grooves

of the ceiling joists and also having roof panels extending over and bearing upon the upper edges of a part of the wall panels and having a separable interlocking association with the latter, facing strips introduced between the ceiling joists and engaging the inner grooves of the latter, and key devices interposed between the roof and wall panels and over the ceiling joists and the ends of the ceiling panels to removably secure the roof structure, side wall panels and ceiling panels and joists against accidental disengagement.

16. A building comprising lower and upper frame structures having studs and corner posts interposed therebetween, wall panels applied to the studs and corner posts over the lower and upper frame structures, and a roof structure comprising gable ends having inner gable studs projecting below the lower edges thereof and bearing upon adjacent parts of the upper frame structure, the gable ends also being provided with outer depending grooved strips to fit over the upper ends of the adjacent panels.

17. A building comprising lower and upper frame structures, studs and corner posts interposed between the said structures, wall panels applied to the studs and corner posts and over the lower and upper frame structures, gable brackets held on portions of the upper frame structure and projecting outwardly between the upper ends of the adjacent panels, ceiling joists extending across the upper frame structure and having outwardly projecting extremities between the upper ends of the adjacent panels, the latter panels being provided with locking devices at the inner portions of their upper ends, the ceiling joists having central grooves in their upper sides, ceiling panels mounted on the ceiling joists engaging the latter at opposite sides of the grooves therein, a roof structure embodying rafters engaging the ceiling joists between the ceiling panels and also having roof panels with locking devices engaging the locking devices at the upper ends of a portion of the panels, the roof structure also being provided with end gables having studs extending downwardly below the same and bearing upon the upper portion of the frame structure and also lower grooved strips to fit over the upper ends of the adjacent panels and terminate close to the gable brackets, and key devices inserted between the said locking devices and the ends of the ceiling panels.

18. A building comprising a wall structure including lower and upper frames, the upper frame having side and end plates and ceiling joists thereon, a partition plate held by a part of the upper frame and engaging one of the ceiling joists, the partition plate extending to one side of the ceiling joist with which it engages, studs between the lower frame structure and the said partition plate, and wall panels applied to opposite sides of the studs.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ERNEST P. GARNER.

Witnesses:
W. E. CARR,
E. A. BRANYON.