Jan. 26, 1937. E. C. WASHBURN ET AL 2,068,831

BUILDING STRUCTURE

Filed Oct. 12, 1935 4 Sheets-Sheet 1

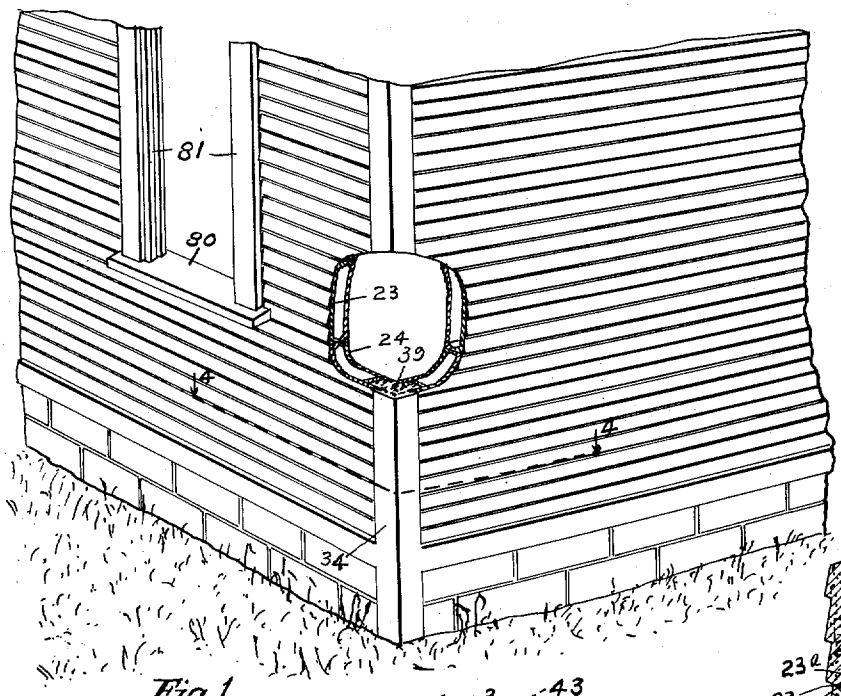


Fig. 1

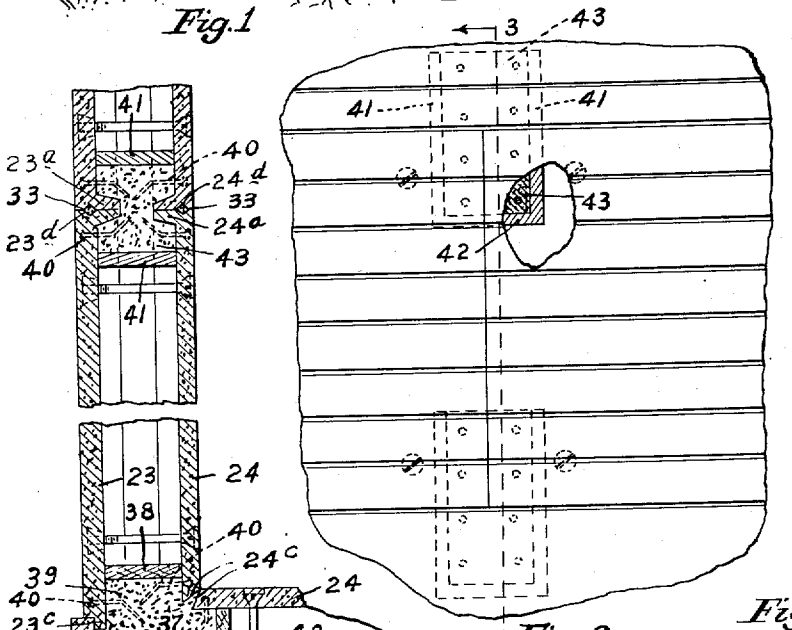


Fig. 2.

Fig. 4.

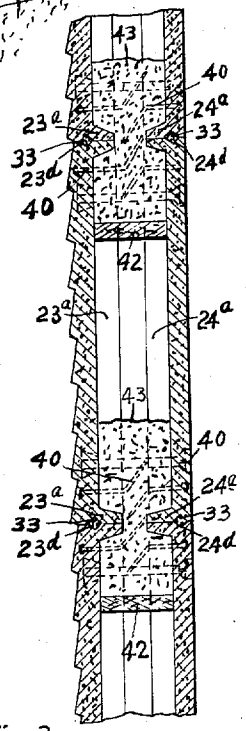


Fig. 3.

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BUILDING STRUCTURE

Filed Oct. 12, 1935 4 Sheets-Sheet 2

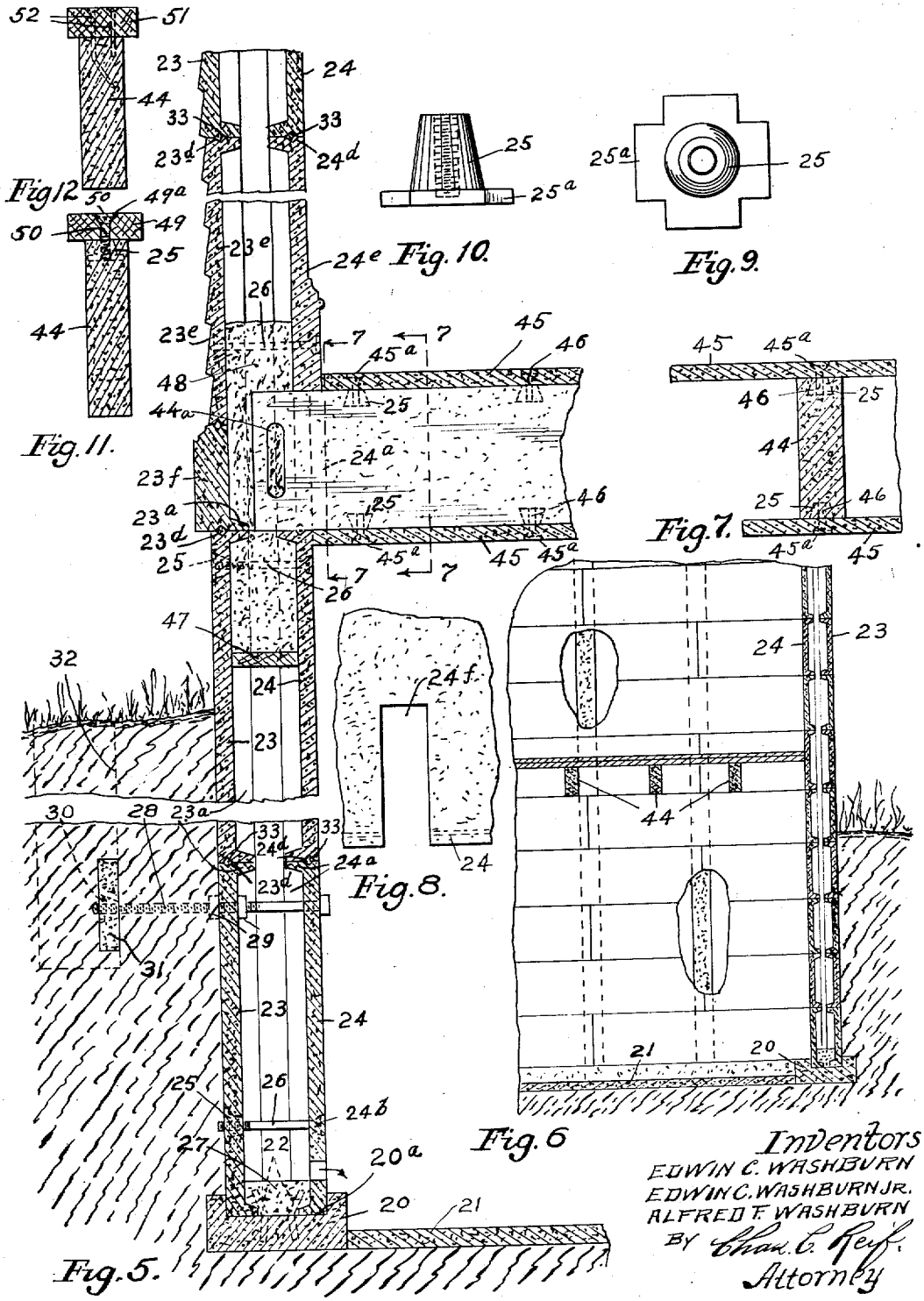


Fig. 12

Fig. 10.

Fig. 9.

Fig. 11.

Fig. 7.

Fig. 8.

Fig. 6

Fig. 5.

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BUILDING STRUCTURE

Filed Oct. 12, 1935 4 Sheets-Sheet 3

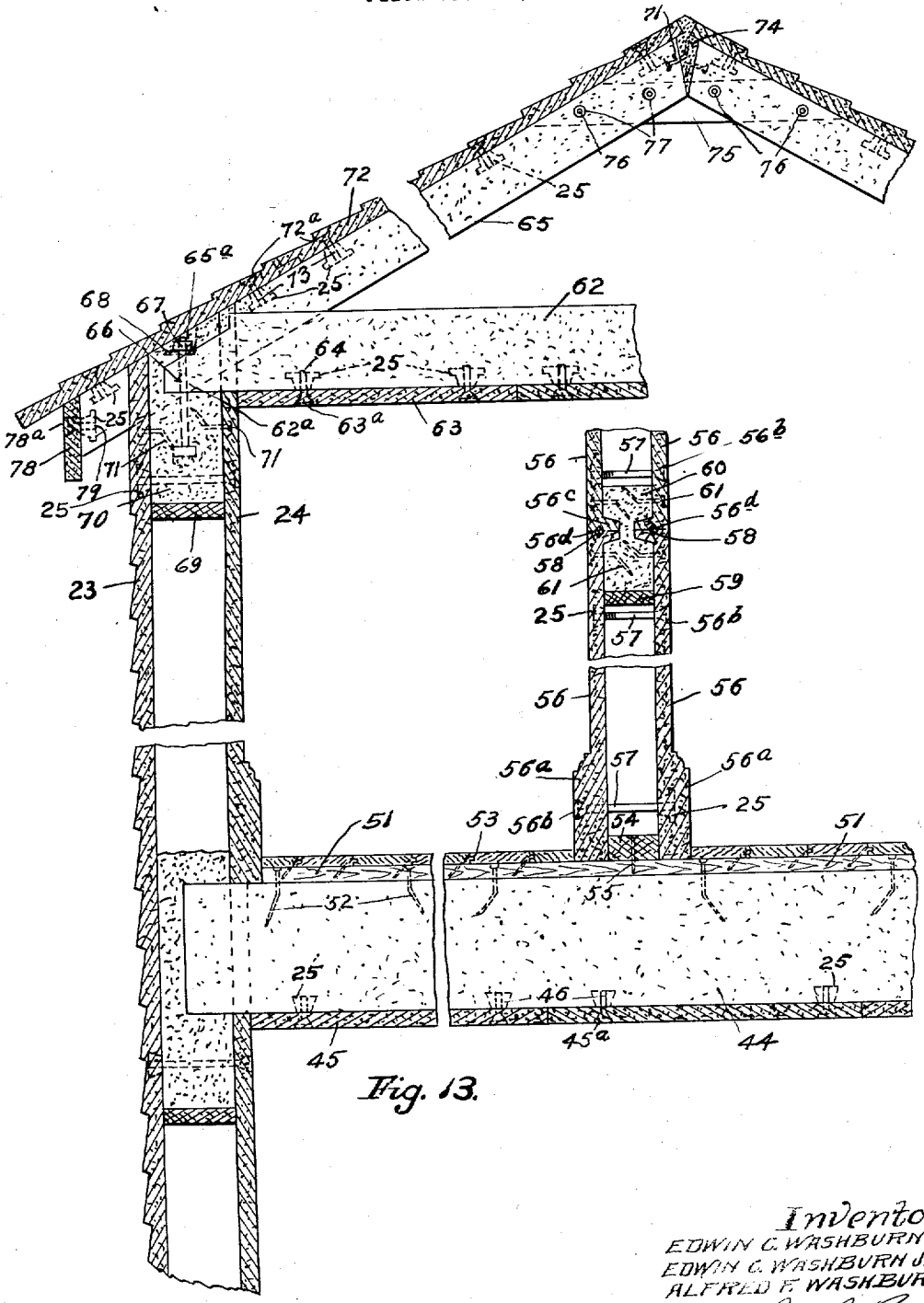


Fig. 13.

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BUILDING STRUCTURE

Filed Oct. 12, 1935 4 Sheets-Sheet 4

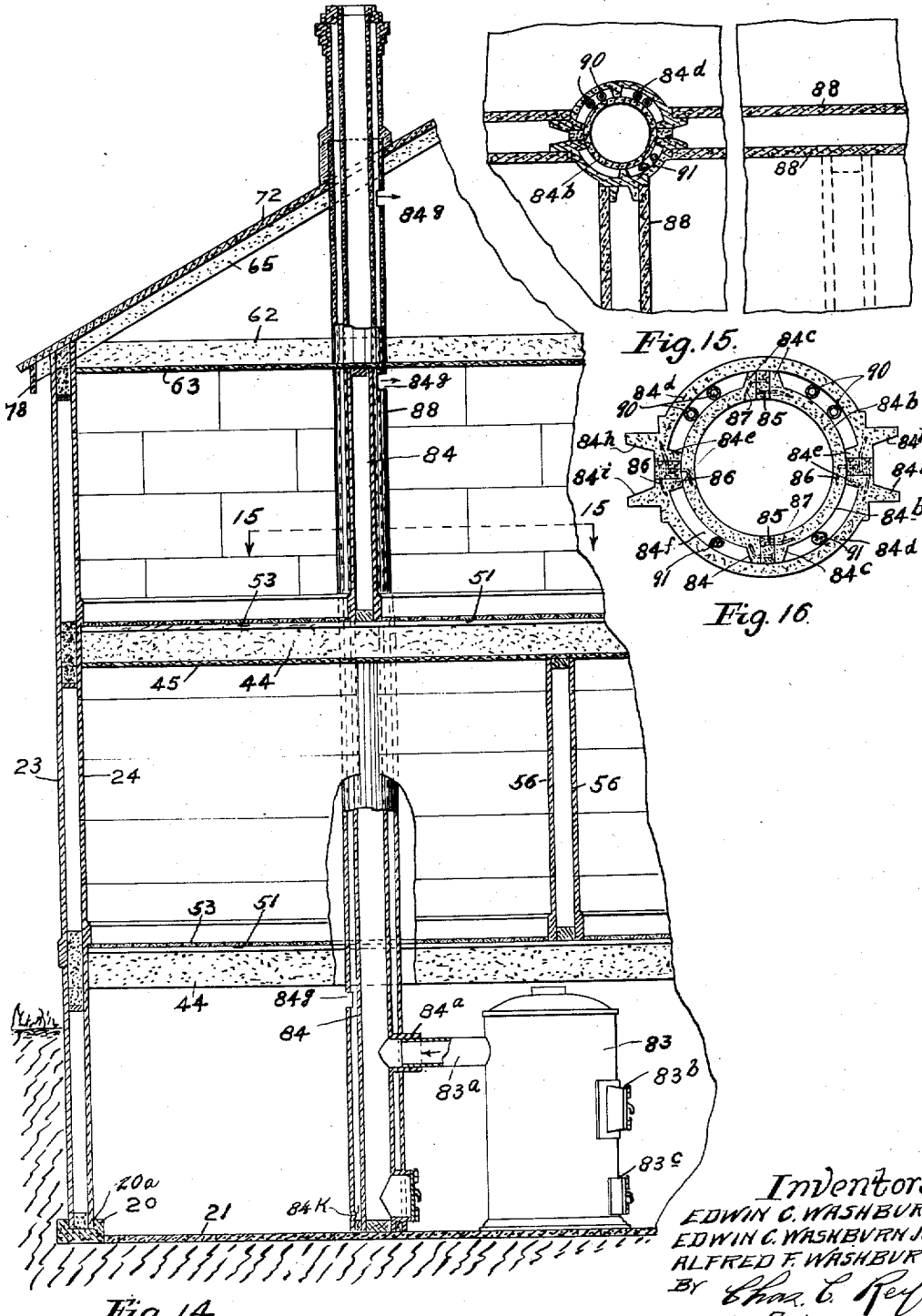


Fig. 14.

Fig. 15.

Fig. 16.

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Patented Jan. 26, 1937 2,068,831

UNITED STATES PATENT OFFICE

2,068,831

BUILDING STRUCTURE

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Application October 12, 1935, Serial No. 44,736

21 Claims. (Cl. 72—1)

This invention relates to a building construction and while the invention may have various applications, it is particularly related to a building construction wherein the building is assembled from preformed parts.

It is an object of this invention to provide a building assembled from slabs or plates preformed from a material such as concrete or a composition material, which slabs or plates can be assembled and secured together without the employment of skilled labor.

It is another object of the invention to provide a building in which the walls are formed of asembled preformed or precast slabs or plates of some such material as concrete, said walls constituting a form for concrete used in the structure of the building.

It is still another object of the invention to provide a building comprising a wall having spaced sides of assembled precast sections, said wall having a body of tying material such as concrete poured between said sides at certain points, preferably where joints occur, said sections preferably having tying means projecting into said poured concrete so that an integral structure is provided when said poured concrete sets.

It is a further object of the invention to provide a building and method of making the same in which preformed or precast plates or slabs of some material such as concrete or composition material are provided, corner posts of similar material also being provided and the parts held together at various points by means of a body of tying material poured at the time of construction.

It is a further object of the invention to provide a building structure having walls with spaced sides formed of preformed or precast sections, preformed joists of concrete or similar material extending between said walls and a body of tying material between said walls in which the ends of said joists are imbedded.

It is still another object of the invention to provide a method of forming a building which consists in assembling preformed or precast sections of concrete or composition material to form walls having spaced sides and pouring a body of tying material such as concrete between said walls at the time of construction to form an integral structure, said walls constituting a form for said tying material.

It is a further object of the invention to provide a method of constructing a building which consists in assembling walls of preformed sections of concrete or composition material, said walls having spaced sides, placing a corner post adjacent said walls and pouring a body of tying material such as concrete to connect said walls and corner post into an integral structure.

It is still further an object of the invention to provide a building comprising a chimney, preferably having spaced walls, the exhaust heat from the chimney or furnace of the building being used to heat certain rooms of said building preferably by having a communication between said rooms and the space between the walls of said chimney.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings, in which like reference characters refer to similar parts throughout the several views and in which:—

Fig. 1 is a partial perspective view of the exterior of said building, certain parts being broken away and others shown in section;

Fig. 2 is a partial view in side elevation of the exterior of said building;

Fig. 3 is a vertical section taken on line 3—3 of Fig. 2 as indicated by the arrows;

Fig. 4 is a horizontal cross section taken on line 4—4 of Fig. 1 as indicated by the arrows;

Fig. 5 is a vertical section taken on line 5—5 of Fig. 1 as indicated by the arrow, said section extending through the basement and a portion of the first floor of said building;

Fig. 6 is a vertical section through the lower portion of the building taken in a direction at right angles to the section in Fig. 5;

Fig. 7 is a vertical section taken on line 7—7 of Fig. 5 as indicated by the arrow;

Fig. 8 is a view in side elevation of the inner wall at the location of a joist;

Fig. 9 is a plan view of a nut or securing member used;

Fig. 10 is a view in side elevation of the member shown in Fig. 8;

Fig. 11 is a view similar to Fig. 7 showing a modification;

Fig. 12 is a view similar to Fig. 11 showing a further modification;

Fig. 13 is a view in vertical section similar to Fig. 5 but taken through the upper part of the building;

Fig. 14 is a view in vertical section similar to Fig. 13 taken throughout the whole building and showing the chimney construction;

Fig. 15 is a horizontal section taken on line 15—15 of Fig. 14 as indicated by the arrows;

Fig. 16 is a horizontal section of the chimney shown on an enlarged scale.

Referring to the drawings, particularly Figs. 1

to 5, a building construction is shown comprising a foundation portion **20**. This foundation will be placed at the lower portion of the building and will be of suitable depth and width. While the foundation may extend as desired into the ground in Fig. 5, it is shown as extending to the bottom of the floor **21**, which is the floor of the lower room or basement. Said foundation portion **20** is illustrated as substantially rectangular in vertical cross section but having a trough or groove **20***a* in its upper side which is also of rectangular form in cross section. Tie members **22** are preferably imbedded in the foundation **20** and project upwardly into groove **20***a*. While these tie members may be of any desired form they are shown as small rods or wires having their lower ends imbedded in foundation **20** and their upper ends projecting upwardly into groove **20** at an angle to said lower ends. Plates **23** are provided which form the exterior of the lower wall portion of the building. Plates **23** will be precast of some material such as concrete or some composition material and the same are shown as rectangular in form and as having ribs **23***a* extending along their edges. Plates **24** similar to plates **23** are also provided which preferably will be of the same length and width as plates **23**. While plates **23** and **24** may be of any desired thickness, the latter are shown as of somewhat smaller thickness than plates **23**. Plates **23** have imbedded therein one or more securing members **25**. While said securing members may take various forms, in the embodiment of the invention illustrated they are shown in the form of a frusto-conical nut having projecting flanges **25***a* at one end. See Figs. 9 and 10. Said members **25** will be imbedded in the plates **23** when the same are cast. Plates **24** are also provided with ribs **24***a* extending along their edges. While the ribs **23***a* and **24***a* may be of any desired form, in the embodiment of the invention illustrated they are shown as trapezoidal in cross section with their wider ends adjacent plates **23** and **24** respectively. Plates **24** have countersunk holes **24***b* therein and headed bolts **26** extend through holes **24***b* and are threaded into the nuts **25**. The plates **23** and **24** are thus held in rigid spaced relation. After the plates have been positioned and connected by bolts **26** and properly plumbed a body of tying material such as concrete **27** is poured between the same at their lower ends imbedding the tie members **22** and ribs **23***a* and **24***a*. When the material **27** sets or hardens the plates **23**, **24** and the foundation **20** are rigidly connected in an integral structure. Bolts **26** may be unscrewed and removed if desired after the medium **40** has become hard. If desired, the outer plate **23** may be further anchored by means of a tie bolt **28** extending therethrough and having nuts **29** threaded thereon at the sides of plate **23**. Bolt **28** extends outwardly and is threaded in a nut **30** imbedded in a slab **31** of concrete or similar material placed in the ground some distance from plate **23**. While slab **31** may be of any shape, in the embodiment of the invention illustrated it is shown as a slab rectangular in plan and cross section. Slab **31** will be placed in position by forming a hole indicated by the dotted line **32**. Plates **23** and **24** have respectively formed therein grooves **23***d* and **24***d* which extend longitudinally thereof in their sides. Some neat cement or grout **33** will be placed in said grooves and another plate **23** will then be placed on top of the lower plate **23**. Said upper plate **23** also has the groove **23***d* therein which registers with the corresponding groove in the lower plate so that the material **33** fills both grooves and acts as a bond between said plates. Another plate **24** is placed on top of the lower plate **24** also having a groove **24***d* registering with the corresponding groove in said lower plate, which grooves are filled by the material **33** which thus acts as a bond between said plates. Plates **23** and **24** are thus placed one on top of the other until the desired height is reached.

It may be stated that the assembly of the plates **23** and **24** is preferably first made at a corner of the building. As shown in Fig. 4 the inner and outer plates **23** and **24** are assembled to form walls at right angles to each other. The plates **24** which meet at the inside of the corner are shown as having beveled edges **24***c* which act to form a triangular space between the edges of said plates. The ends of the plates **23** at the corner are rabbetted so as to have projecting flanges **23***c* of reduced width. A corner member **34** is provided and while this corner member may be variously made, in the embodiment of the invention illustrated it is shown as angular in form and having side flanges of rectangular form in cross section at their ends, which ends fit into the rabbetted portions of the plates **23**. Post **34** is also preformed of concrete or some other suitable composition material, preferably non-metallic. Post **34** has imbedded therein one or more of the nuts **25** and a headed bolt **35** extends through a plate **36** having beveled edges engaging the inner sides of the corner plates **23**. Bolt **35** also extends through a washer **37** preferably placed on the inner side of plate or board **36**, which latter may be made of wood. Post **34** is thus firmly held in position relative to plates **23**. Said post **34** will be properly plumbed and boards or plates **38** will then be placed between inner and outer plates **23** and **24** at short distances from the corner post and a body of material adapted to harden, such as concrete **39**, will be poured into the space between plates **23** and **24** and between the corner post **34** and plates **38**. Plates **23** and **24** will preferably have tie members **40** imbedded therein projecting into said space and these will be imbedded in the material **39**. While various kinds of tie members may be used, members **40** are illustrated as headed nails or spikes having their head end portions imbedded in plates **23** and **24** and their shanks projecting into said space and being bent at an angle to said head end portions. When the material **39** has set or hardened the members engaged thereby are formed into one integral structure. The material **39** will not necessarily be continuous at the corner post but may be placed at the bottom of the corner post and at spaced points therealong, particularly at the floor zones, a board or plate being placed between the walls and said corner post to support said material when poured.

In Fig. 4 a vertical joint between plates **23** and **24** is shown and the ribs **23***a* and the ribs **24***a* are shown as having the grooves **23***d* and **24***d* therein registering in the adjacent plates and in which is placed the material **33** as already described in connection with Fig. 5. Said material **33** thus acts as a bond between the adjacent plates **23** and the adjacent plates **24**. Boards or plates **41** are disposed vertically adjacent the ribs **23***a* and a bottom plate or board **42** extends between boards or plates **41**. The members **41** and **42** are placed at spaced intervals vertically of the joints between plates **23** and **24** and a body of material adapted to harden, such as concrete **43**, is poured into the space between plates **23**

and 24 and the plates 41, the same being supported by plates 42. Tie members 40 already described have their end portions imbedded in plates 23 and 24 and project into the material 43. The ends of these members projecting into said material are preferably bent at an angle as shown in Fig. 4 to form a positive tie or lock. After the material 43 has set, the plates 23 and 24 are secured together to form a rigid integral structure.

At or a short distance above the ground the exterior plates 23 are formed with some design on their outer sides and while various designs may be used, in the embodiment of the invention illustrated said plates designated 23e are shown as formed to represent the common colonial clapboard. In Fig. 5 the lower of the plates 23e is shown as having a base board effect 23f.

To form the floors of the building transverse members or joists 44 are provided. Members 44 are preferably made of concrete or similar material and project into the wall formed by plates 23 and 24 as shown in Figs. 8 and 13. The plate 24e which is disposed adjacent and above member 44 has a slot 24f therein through which member 44 projects. Member 44 preferably has imbedded therein suitable securing members such as the nuts 25. Plates 45 preferably precast of concrete or some composition material may be disposed on and below the joists 44 and are provided with countersunk holes 45a through which extend headed bolts 46 threaded into the members 25 so that said plates 45 are securely held in position. After the members 44 are in place a board or plate 47 may be disposed between the plates 23 and 24 some distance below the members 44 and a body of material adapted to harden, such as concrete, which material is designated 48, is poured between plates 23 and 24 and suitable vertical boards or plates similar to the boards or plates 41 already described. The material 48 surrounds the ends of the members 44 as well as some of the connecting bolts 26 and the ribs 23a and 24a of the plates 23 and 24 so that all of these parts are securely connected into a rigid integral structure. Member 44 preferably is also provided with an opening such as the slots 44a through which the material 48 also passes and in which said material is permanently disposed.

In Fig. 11 one of the joists 44 having imbedded therein the members 25 is shown and a wooden strip 49 having countersunk holes 49a therein is connected to member 44 by headed bolts 50 extending through said holes and threaded into the members 25. Strip 49 thus constitutes a facing for joist 44. The structure shown in Fig. 11 may be used where it is desired to have wooden flooring. The flooring may be nailed to member 49, which thus forms a nailing strip.

In Fig. 12 a joist 44 is shown and a wooden strip or facing 51 is secured to the top of member 44 by the headed nails or spikes 52 driven therethrough and having their lower end portions bent and imbedded in member 4. Said portions will, of course, be imbedded in member 44 at the time it is cast. Member 51 thus also forms a nailing strip if it is desired to place wooden flooring thereon.

In Fig. 13 the upper portion of the building is shown and one of the joists 44 is shown having slabs 45 of concrete or similar material secured to its bottom side and as having the nailing strip 51 secured to its top side. Wooden flooring 53 is laid on top of the strip 51 and will be nailed thereto in the usual manner, said flooring being shown as of the usual tongue and groove construction.

Where a partition is to be made a comparatively heavy strip 54 can be placed transversely of members 51 and secured thereto in any suitable manner as by the nails 55. Slabs or plates 56 of concrete or other similar earthy or composition material are placed against each side of member 51 to extend vertically. The members 56 are illustrated as having a base board effect 56a at their bottom portions and one of said plates will have imbedded therein suitable securing members such as the nuts 25. The other or opposite plates 56 will have countersunk holes 56b therein and bolts 57 may extend through holes 56b and be threaded into members 25. Plates 56 are thus securely held in spaced relation. The plates 56 will be arranged in superposed relation and preferably will have ribs 56c at their edges which may be provided with the longitudinally extending grooves 56d. The grooves 56d will register in the superposed plates and some bonding material 58 such as cement, grout or other suitable material will be placed in said grooves. A plate or board 59 will be placed some distance below the joint of plate 56 and some material adapted to harden, such as concrete, will be placed between the plates 56, said material being designated 60. Plates 56 will have tie members secured thereto and while various forms of tie members might be used, in the embodiment of the invention illustrated headed spikes or nails 61 are shown having their head portions imbedded in plates 56 with their shanks projecting therefrom and bent at an angle. These members 61 are imbedded in the material 60 as are also the ribs or flanges 56c so that after material 60 sets or hardens an integral structure is formed including the plates 56.

At the roof portion of the building joists 62 will be used similar to the joists 44 already described except that the end portions 62a thereof will be preferably beveled on their upper sides. The top plates 24 will have suitable slots cut therein to accommodate the joists 62. Joists 62 are illustrated as having suitable securing members cast therein such as the nuts 25 and a ceiling is shown comprising plates 63 having countersunk holes 63a therein, through which holes pass the headed bolts 64 threaded into members 25 holding plates 63 in place. Obviously a nailing strip such as the strips 49 or 51 shown in Figs. 11 and 12 could be used at the bottom of joists 62 and a wooden ceiling or lath secured thereto if desired. A plaster or other desired ceiling could be secured to the lath. Rafters 65 are provided and extend at an angle upwardly from each side of the building forming a gable roof structure. The top plates 23 and 24 are provided with suitable slots to accommodate the rafters 65. The rafters 65 will, of course, be disposed between the joists 62 and said rafters are preferably provided with recesses 65a and anchoring means such as bolts 66 extend through said rafters and have their headed portions extending below said rafters between plates 23 and 24. Bolts 66 are provided with nuts 67 preferably resting on washers 68 disposed on the horizontal portion of the recess 65a. A board or plate 69 is disposed some distance below the rafters 65 and a body of material adapted to harden, such as concrete, is poured between walls 23 and 24 above plate 69, which

material is designated 70. This material will extend to the top of plates 23 and 24 and will imbed the ends of joists 62 and the portion of rafters 65 between walls 23 and 24. After the material 70 has set or hardened the nut 67 can be tightened so that the rafters are securely held in position. An integral structure is formed including parts 23, 24, 62 and 65 as well as the anchoring member 66. Other tie members 71 such as the headed nails or spikes already described may have portions imbedded in plates 23 and 24 and have bent portions extending into the material 70. The rafters have suitable securing members imbedded therein, such as the nuts 25, having their ends exposed at the top and lower end of said rafters. While various roofing materials may be used, in the embodiment of the invention illustrated plates 72 which preferably will be precast of some material such as concrete or composition are shown as placed on top of the rafters 65, said plates having countersunk holes 72*a* therein. Headed bolts 73 extend through said holes and into the members 25, thus securing plate 72 firmly and rigidly on the rafters. Roof plates 72 may be as illustrated made to represent shingles or tiles. A perfectly tight structure is thus provided at the edges of the roof. Plates 72 are shown as shaving rabbeted and overlapping edges. A space is formed between the upper ends of rafters 65 and of the upper plates 72 and some material adapted to harden, such as concrete, is poured into said space, said material being designated 74. Tie members such as nails or spikes 71 are cast in rafters 65 and extend into material 74. A tie member 75 extends between each pair of rafters 65 and will be secured thereto by bolts 76 extending therethrough and into threaded securing members 77 imbedded in the rafters 65. A cornice 78 extends transversely of the lower ends of the rafters 65 beneath the lowermost plate 72, the same having countersunk holes 78*a* therein. Headed bolts 79 extend through holes 78*a* into one of the nuts 25 and hold plate 78 in place.

Window casings including the sill 80 and the casing members 81 may be inserted in the walls as desired and as shown in Fig. 1. Said window frames may have the sills 80 of concrete or other desired material while parts 81 may be of wood or metal.

In Fig. 14 a vertical section is shown through the building and a furnace 83 is shown as disposed in the lower room or basement. A chimney 84 has a flue 84*a* to which the smoke pipe 83*a* of the furnace is connected. Said furnace is shown as having the usual fire door 83*b* and the ashpit door 83*c*. While chimney 84 might be variously made, it preferably is constructed of segmental sections 84*b* of semi-cylindrical form, the same having ribs or flanges 84*c* extending longitudinally thereof at their edges. Sections 84*b* have tying and spacing members 85 inbedded therein and projecting from their ends. While these tying members may take various forms, in the embodiment of the invention illustrated they are shown as made of headed spikes. Said chimney also has outer sections 84*d* also of semi-cylindrical form and which have ribs or flanges 84*e* extending longitudinally at their edges. The flanges 84*c* and 84*e* act as radial spacing members for the sections 84*b* and 84*d*. Sections 84*d* also have spacing members 86 projecting from their ends and while these might be variously formed, in the embodiment of the invention illustrated they are shown as headed spikes. Sections 84*b* also have tying members 87 projecting from their outer sides into the space between the ends of sections 84. After the sections are assembled as shown in Fig. 16, concrete or other material adapted to harden is poured into the spaces between the ends of sections 84*b* and into the spaces between the ends of sections 84*d*. Suitable forms will be placed in position to cover the open sides of said spaces. After said material has set or hardened the chimney will comprise an integral structure and the said sections will be securely and rigidly held together. It will be seen that sections 84*b* form an inner wall while sections 84*d* form an outer wall and that the chimney thus has a wall of two layers with a space or spaces 84*f* therebetween. Said spaces form convenient passages for pipes 90 or wiring conduits 91 used in the building. The space or spaces 84*f* may be connected by openings 84*g* to the attic and other floors between the ceiling 63 and the roof and similar openings may be made between said spaces and the other rooms of the building if desired. The sections 84*d* may have the projecting flanges or ribs 84*h* and 84*i* at the outer sides thereof and partition walls 88 of the building may engage the outer sides of flanges 84*i* and be spaced thereby, the ends of said partition members engaging the outer sides of the ribs 84*h*. The chimney 84 is shown as projecting above the roof plates 72 and the top of the chimney is of thickened and ornamental construction as shown in Fig. 14. An opening 84*k* at the bottom of the chimney admits air to space 84*f*.

From the above description it is seen that applicant has provided a simple and efficient structure of building and method of making the same. The preformed parts used are easily made at small expense and these parts can readily be assembled on the job by unskilled labor. The tying material or concrete is placed at the time of construction and holds all of the parts in rigid relation and forms in reality an integral structure. This gives great strength to the construction. The tying material or concrete is used only where necessary and forms a very small part of the building material. The walls act as forms for this tying material which greatly facilitates the operation of building. The building will be entirely fireproof. The construction being of concrete or composition material the building will be very durable. The exterior of the building as illustrated will resemble wooden clapboard and will have a pleasing appearance. Obviously other designs can be used on the exterior.

With the chimney construction used the waste or exhaust heat from the furnace is utilized to heat the attic or other rooms. This makes an efficient use of heat which would otherwise be lost and will result in reduced fuel consumption. The chimney construction also forms an efficient ventilating means.

It is obvious that the method and structure will have a high degree of utility for the purpose intended.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the structure and in the steps and sequence of steps of the method without departing from the scope of applicants' invention, which, generally stated, consists in a method and structure capable of carrying out the objects above set forth, such as disclosed and defined in the appended claims.

What is claimed is:—

1. A structure comprising spaced plate-like members adapted to form a wall, a bolt extending between said members for drawing the same together, said bolt extending some distance from said wall at one side thereof and an anchoring member disposed in the ground to which said bolt is connected.

2. A structure comprising precast plate-like members forming the outer side of a wall and spaced at their ends, a precast post member engaging the outer sides of said members at their adjacent ends, means engaging said post and extending inwardly therefrom between said members for holding said post in position and a post poured medium binding said means, members and post together.

3. A structure comprising spaced precast plate-like vertical members adapted to form the outer side of a wall, a precast vertical member extending between said members and engaging the outer sides thereof, a threaded metallic member imbedded in said last mentioned member, a placing member engaging said first mentioned members, a holding member extending through said placing member into said threaded member for holding said first mentioned member in position and a post cast medium disposed between said first mentioned member, said second mentioned member and said placing member for holding all of the same in position.

4. A structure comprising spaced preformed plates adapted to form a foundation wall, a base member having a recess therein in which the lower ends of said plates are disposed and having upwardly extending metallic tie members with their ends imbedded in said base member and having portions projecting into said recess and bent at an angle to said imbedded portions and a post poured medium between the lower portions of said plates and in said recess and about said metallic ties.

5. A building structure comprising a series of precast vertical plate-like members forming a wall arranged to enclose a vertical chamber, a second series of precast vertically extending plates forming a wall extending about and spaced from said first mentioned wall, a space thus being formed between said walls, said chamber being adapted to form a chimney and said space being adapted to act as a collector of heat from said chamber.

6. The structure set forth in claim 5, a building having spaced floors through which said structure extends and openings in said second mentioned wall into said space between the various floors of said building.

7. A foundation structure for a building comprising a precast base member having a recess therein, side wall plates disposed in said recess and engaging the sides thereof, tie members having portions imbedded in said base member and portions projecting upwardly therefrom and a post poured binding medium about said projecting portions and between said side plates tying all of said parts together and forming an integral unit.

8. The structure set forth in claim 7, bolts extending between and engaging said plates to hold the same in position, said bolts being removable after said post poured medium is in place.

9. A building structure comprising a precast corner post, precast wall plates disposed in planes at right angles to each other engaging the edges of said post, other wall plates spaced respectively from said first mentioned plates and having engaging edges, headed members having their heads imbedded in said wall plates and projecting into the space therebetween, means holding said corner post against said first mentioned wall plates and a post poured medium between said plates and post imbedding said projecting portions and tying all of said parts together.

10. A building structure having a precast corner post, wall plates engaging the edges and inner sides of said corner post, a member extending between said wall plates having beveled edges respectively engaging said wall plates and a holding member extending between said last mentioned member and corner post tending to move the same together to hold said corner post against said wall plates.

11. A foundation structure comprising a precast base member, spaced vertical wall plates supported by said member and extending upwardly therefrom and a bolt having means thereon spacing said plates and extending beyond one plate into the earth and acting as a tie or brace member.

12. A building structure comprising spaced precast plates, one of said plates having a slot extending transversal therethrough, a rafter member extending through said plate and disposed in said slot and a post-poured medium between said plates forming therewith a wall and imbedding said rafter member.

13. The structure set forth in claim 12, a member imbedded in said medium having a threaded end projecting thereabove and a nut disposed on said threaded end and engaging said rafter to hold the same.

14. A building structure comprising spaced pairs of superposed precast plates, the plates of each pair having engaging inwardly projecting flanges with mating grooves therein, a bonding material in said grooves, spaced platelike members extending between said pairs of plates, means for drawing said plates together against said members and a post-poured medium between said pairs and member surrounding said flanges and holding said plates and members in position.

15. A building structure comprising spaced precast members, spaced spacing plates extending therebetween and having their opposite edges abutting adjacent sides of said members, ties embedded in said members respectively and having end portions projecting therefrom between said members, bolts for drawing said members together and against said plates and a post cast medium disposed between said members and about said ties.

16. As an article of manufacture, a wall member precast of concrete, and a bored securing member embedded in said wall member in intimate contact with said concrete, said securing member including integral portions preventing the entrance of concrete into the bore thereof.

17. A building structure comprising prefabricated members arranged to edge, a plurality of headed stud members having their headed portions embedded adjacent the vertical adges of each of said prefabricated members and projecting therefrom, and a pourable bonding agent disposed about the adjacent edges of said prefabricated members and surrounding the projecting ends of said stud members and adapted to harden to bind all of said members together.

18. A building structure comprising spaced prefabricated wall members adapted to form a hollow wall, spacing plates extending between

said wall members in spaced relationship, stud members embedded in said wall members, said stud members having end portions projecting therefrom between said wall members, and a pourable bonding agent adapted to harden and bind all of said members together.

19. A structure comprising prefabricated wall members angularly disposed with respect to one another, a prefabricated post member engaging adjacent vertical edges of said wall members, means secured to said post member and engaging said wall members and adapted to draw and hold all of said members in related assembly, and a pourable bonding agent adapted to harden and bind said members and said means together.

20. A hollow wall having spaced inner and outer sides, each side comprising a plurality of prefabricated plate members arranged edge to edge, each vertical edge of each plate having an inwardly extending flange whereby the abutting flanges of adjacent plates form an inwardly extending projection at each of the vertical seams between adjacent plates, and a pourable bonding agent between the sides disposed about each projection and adapted to harden to bind adjacent flanges together.

21. A hollow wall comprising inner and outer sides, each side comprising a plurality of prefabricated plate members arranged edge to edge forming vertical seams, stud members embedded in said plate members adjacent said seams projecting into the space between said sides and terminating short of the side toward which each projects, and a pourable bonding agent between the sides adjacent each seam and embedding the projecting portions of said stud members, said bonding agent being adapted to harden to grip said stud members and bind said sides together in their assembled position.

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CERTIFICATE OF CORRECTION.

Patent No. 2,068,831. January 26, 1937.

EDWIN C. WASHBURN, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, first column, line 28, for the word "shaving" read having; page 5, second column, line 27, claim 12, for "transversal" read transversely; line 51, claim 15, strike out the word "respectively" and insert the same after "abutting" in line 50, same claim; line 64, claim 17, after "arranged" insert edge; line 66, same claim, for "adges" read edges; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of March, A. D. 1937.

(Seal)

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Acting Commissioner of Patents.

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