Oct. 23, 1923. 1,471,841

W. C. FLANNERY

CONCRETE BUILDING

Original Filed Aug. 26, 1915 2 Sheets-Sheet 1

Fig. 1.

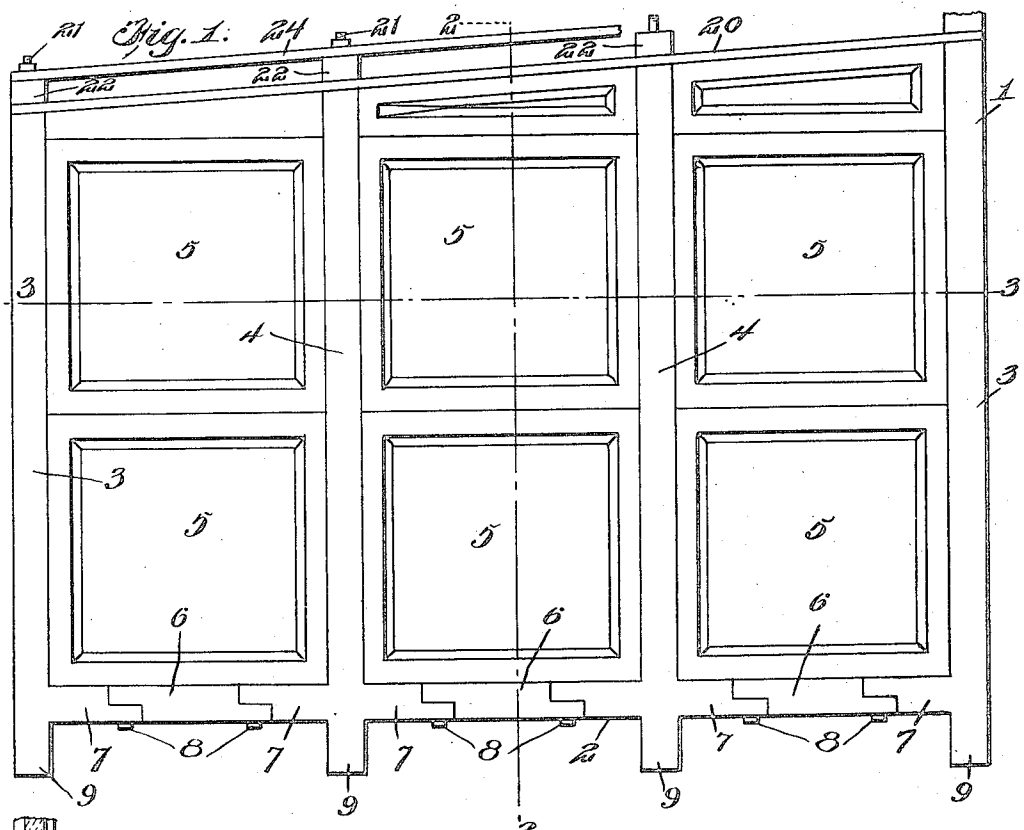


Fig. 3.

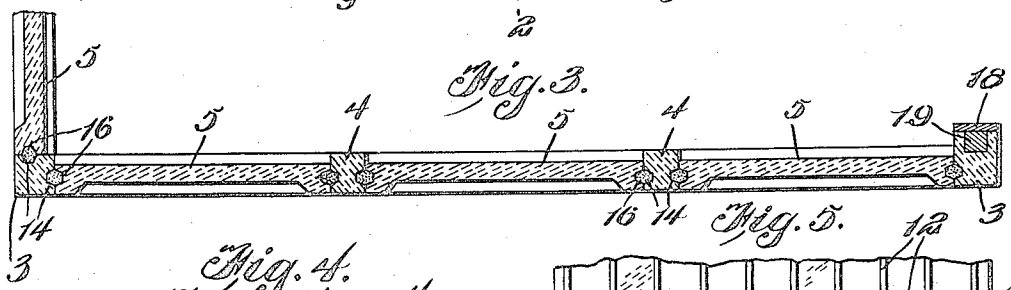


Fig. 4.

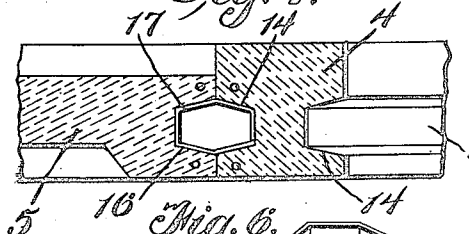


Fig. 5.

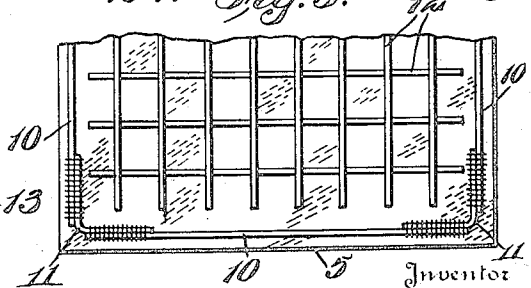
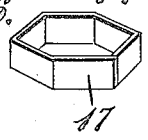


Fig. 6.



Witness

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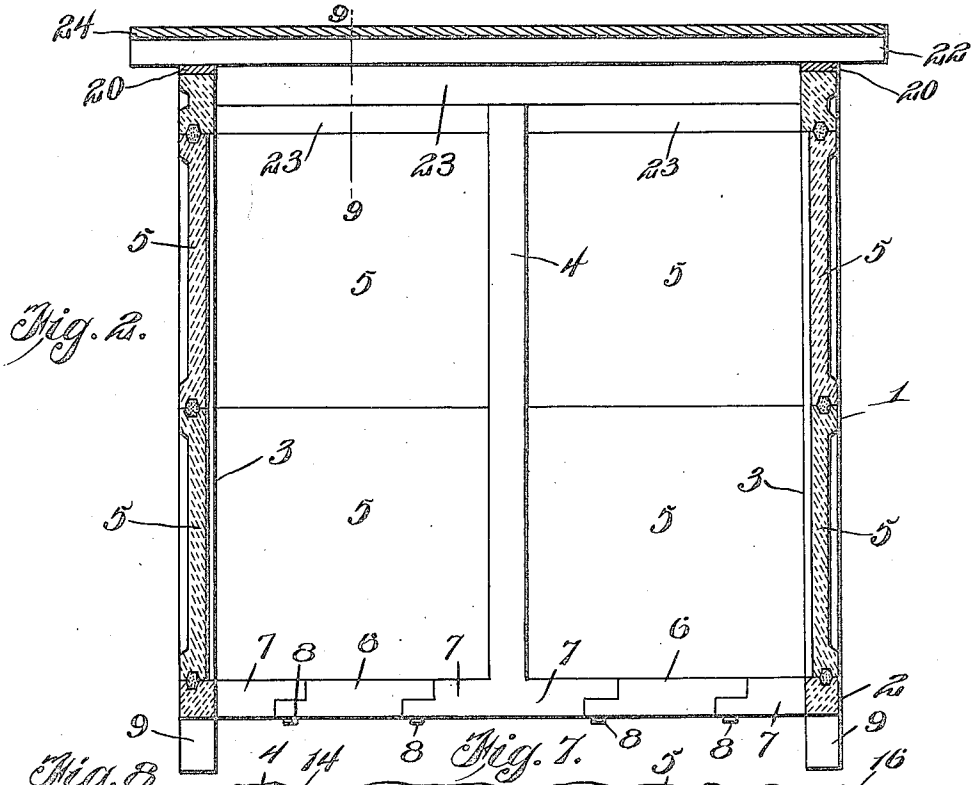


Fig. 2.

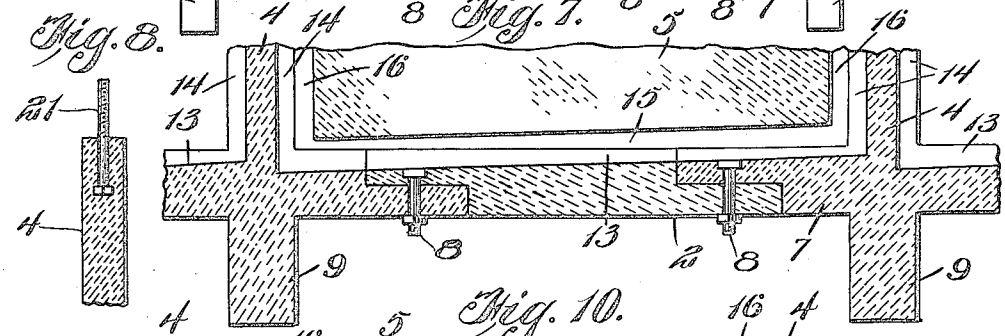


Fig. 8.

Fig. 7.

Fig. 10.

Fig. 9.

Witness

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Patented Oct. 23, 1923. 1,471,841

UNITED STATES PATENT OFFICE.

WILLIAM C. FLANNERY, OF ELKRIDGE, MARYLAND, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF SEVENTY-FIVE PER CENT TO M. MARKHAM FLANNERY AND TWENTY-FIVE PER CENT TO C. CALVERT HINES, BOTH OF WASHINGTON, DISTRICT OF COLUMBIA.

CONCRETE BUILDING.

Application filed June 22, 1916, Serial No. 105,108. Renewed September 21, 1920. Serial No. 411,812.

To all whom it may concern:

Be it known that I, WILLIAM C. FLANNERY, a citizen of the United States, residing at Elkridge, in the county of Howard and State of Maryland, have invented new and useful Improvements in Concrete Buildings, of which the following is a specification.

This invention relates to concrete buildings, and particularly to improvements in the construction of garages, dwellings and other houses, factories and other similar buildings, and the present application is a continuation in part of my prior application Number 47,410, filed August 26, 1915.

The object of the invention is to provide a building structure formed of pre-cast or molded elements of concrete of a character capable of being quickly and inexpensively assembled so as to produce a strong and durable structure which may be made as ornamental in appearance as desired.

A further object of the invention is to provide a concrete building structure in which the parts are locked and bound together in a practically homogeneous manner, and in which the time and expense of labor incident to grading, plumbing and squaring of the upright frame elements and erection of the component parts of the structure are reduced to the minimum.

A still further object of the invention is to provide a building structure in which the walls are composed of interlocking posts and slabs, and in which the posts are provided with lateral projections forming engaging members and sill pieces and cooperating with each other or with related sill pieces to furnish a strong and durable type of base for the frame portion and other component parts of the walls of the structure.

A still further object of the invention is to provide a building structure including units formed of posts having sill forming portions and anchoring portions, all cast or molded in a single piece.

A still further object of the invention is to provide improved means for uniting the posts and slabs and elements of the base portion of the structure, as well as improved means for uniting the upper ends of the posts and supporting a desired type of roof.

With these and other objects in view, the invention consists in the features of construction, combination of elements and arrangement of parts which will be hereinafter described, pointed out in the appended claims and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a building, such as a garage or like building, constructed in accordance with my invention;

Figure 2 is a vertical transverse section on the line 2—2 of Figure 1;

Figure 3 is a horizontal section on the line 3—3 of Figure 1;

Figure 4 is a detail horizontal section, on an enlarged scale, through a post and one of the slabs, showing the reinforcing and connecting means;

Figure 5 is a sectional view through one of the slabs and illustrating the reinforcing means thereof;

Figure 6 is a view of one of the keys or clips employed in the building structure;

Figure 7 is a vertical section through the base and one of the bottom slabs as they appear prior to the filling in of the sealing and binding cement;

Figure 8 is a detail section through the upper end of one of the posts;

Figure 9 is a detail section on the line 9—9 of Figure 2;

Figure 10 is a vertical section similar to Figure 7, showing a modified structure.

Referring now more particularly to the drawings, 1 designates a building structure, preferably, but not necessarily, of rectangular or oblong rectangular form, and which may be in the nature of a garage, dwelling or other house, stable or other small building. This building is shown in the present instance as being constructed to receive a sloping roof, and as being built minus the floor, windows and doors, but it is to be understood that any type of roof, doors and windows may be employed, so that with certain exceptions a specific description thereof is unnecessary.

As illustrated, the structure is shown as comprising a base 2, corner posts 3, intermediate posts 4, wall slabs or panels 5, and sill pieces 6. The base 2 is illustrated in the structure shown in Figures 1 to 9, inclusive, as consisting of individual or separate intermediate sill pieces 6 and sill pieces 7 molded with and formed by horizontal or lateral projections from the posts 3 and 4,

said intermediate sill pieces being composed of blocks preferably halved at their ends to overlap the similarly halved ends of the sill projections 7 to form scarf joints, the aforesaid elements being suitably united at their overlapping points, as by bolts 8. The sill projections 7 of the corner post 3 are disposed at right angles to each other, as will be readily understood, and it will be noted that all of the posts are provided with anchoring portions 9 which, in practice, are embedded in the ground or other foundation. The posts are thus constructed to provide building units of a novel type, each consisting of a post body proper having lateral sill projections and an anchoring portion, thus providing for the formation of a strong and durable type of sill structure or base and anchoring members. When the parts of the base are united the floor of the building, which may be of cement or other suitable material, is filled in or laid in any suitable manner, thus forming a firm, strong and durable bottom support, and the strength of this may be increased by embedding the anchoring portions 9 in cement poured into holes in the ground receiving said anchoring portions in such a manner as to invest the anchoring portions therein. Where the distance between adjoining posts is not objectionably great, the intermediate sill pieces 2 may be dispensed with and the cooperating sill projections 7' extended the full distance between the posts and directly united by suitable means, as by tie bolts 8', as illustrated in Figure 10.

The wall slabs or panels 5 are cast or molded in rectangular or oblong rectangular form, and the inner faces of these slabs are or may be plane surfaced, while the outer faces thereof are or may be recessed or paneled, as shown, to produce a desired ornamental effect. These slabs fit down between the posts and are suitably reinforced, the body of each slab being shown in the present instance as provided with a marginal reinforcement 10 of rods or bars connected by angular corner pieces 11 which are lashed or otherwise suitably secured thereto, together with centrally disposed vertically and horizontally extending reinforcing rods 12, whereby the slab is rendered throughout of maximum strength and durability. The sill pieces and lateral sill projections of the posts are formed in their upper faces with grooves or recesses 13 which intersect vertical grooves 14 formed in the sides of the posts, and the end edges of the slabs 5 are provided with similar horizontal grooves 15 and vertical grooves 16, which register with the respective grooves 13 and 14 when the parts are united, the grooves 13 and 15 being deepened or inclined in opposite directions between the opposite end grooves.

When the posts are set up and united in the manner described to form the base and frame, the walls are formed by fitting the slabs in the receiving spaces between the posts, and when the said slabs are placed in position they are fastened against displacement to the posts and to each other by means of connecting members or clips 17 which are arranged to engage the grooves between the meeting edges of the posts and slabs so as to hold said slabs preliminarily locked and in alinement with each other. As shown in the present instance, the grooves are preferably V-shaped, each flaring toward its mouth, and the clips or connectors 17 are in the form of hexagonal rings which fit within the grooves and hold the slabs stably connected. The posts and slabs are then permanently united by flowing a fluid cement, such as grout, into the vertical grooves so as to fill the same, the cement also flowing to the horizontal grooves and filling such grooves, whereby all of the abutment surfaces of the slabs, the sills and the posts will be firmly and securely bound together in a substantially homogeneous manner. The cement will also envelop the clips or connectors 17 and hold them bound in position, while the cement filling the grooves in the sill pieces will invest the bolts 8 and 8' and fasten them against any possibility of casual displacement. All the elements of the building structure will thus be tied so rigidly together that an exceedingly strong and rigid type of building may be constructed without the necessity of using parts of material thickness. Hence all the parts of the structure may be made and shipped with facility from a factory to the point of use, or built directly at the point of use, and the operation of assembling the parts to form the frame and base and then erecting thereon the slabs to form the walls may be readily, quickly and easily performed, so that a structure of any given size within determined limits may be erected with great ease, convenience and economy. As the parts are pre-cast or molded, and cured to a definite degree before use, a moisture-proof structure will also be provided. Furthermore, as the cement seals the walls against the access of both air and moisture, a building is produced which may be readily warmed in cold weather.

In the construction of a building which is to be provided with windows, the windows may be inserted to take the place of individual slabs, and where doors of various constructions are to be used the building may be constructed with due regard thereto. Assuming that the building is to be used as a garage, it will, of course, be understood that it will be built with one end open and the door frame and door built in in any suitable manner at the open end. As

shown in Figure 3, wooden facing strips 18 may be secured to wooden blocks 19 embedded in the corner posts at the open end of the building, to which strips the door frame may be fastened to support any type of door. In casting or molding the posts and slabs the faces of these elements may be given a surface finish of marble, granite or other stone, or may be pebble-dashed by coating such faces with the surfacing while the plastic material is still moist, and therefore it will be obvious that an edifice which is highly ornamental and esthetic in appearance may be built at a comparatively low cost. Any suitable type of roof may be provided for the completed building. As shown in the present instance, the upper course of slabs may be diamond shaped or otherwise formed with inclined edges to provide a sloping surface for the roof, and to provide for the support of the roof strips 20 of wood or metal are laid upon said inclined edges and provided with openings for the passage of bolts 21, to which strips or bolts are secured the rafters or stringers 22 on which the roof is suspended. To provide for any certain slope, particularly where the upper course slabs of the side walls are of minimum depth or less depth than full depth slabs, concrete filler bars 23 may be provided to fill in the spaces beneath the roof 24 and between the same and the wall of slabs at one end and the door frame at the opposite end, as will be readily understood.

Where the structure is to be sheathed or lathed for the reception of an interior facing or lining, it will be understood that the sheathing or its equivalent may be secured to the posts and slabs or to blocks embedded therein, and suitable means of this kind may also be provided to which an ordinary base board or wash board may be secured. In a building designed to be partitioned into rooms or apartments, suitable provision may be made for the arrangement of division walls and staircases, etc., and it will also be understood that instead of laying the cement or other foundation last such cement or foundation may be laid first and provided with suitable openings in which the anchoring projections may be fitted and secured.

It will of course be understood that in addition to any surface finishing the slabs may be of the same or contrasting colors, and it will be evident that in addition to providing a structure which is proof against the elements, such a structure is also of maximum strength, rigidity and durability, and also absolutely fireproof.

An important feature of my invention resides in the novel and peculiar construction of the posts 4 of T-shaped or cross-shaped formation at their lower ends, whereby the lateral extensions 7 or 7′ are provided. These lateral extensions serve as gauging elements which, when brought into alinement and lapped at the time the posts are set in the holes in the ground or into sockets in a suitably prepared foundation, effect the simultaneous "plumbing" and "squaring" of adjacent posts in a single operation, as well as the spacing of the posts measured (the exact distance) apart. By this means considerable time and labor are saved in the setting up of the framework, and also the necessity of employing skilled labor or of making time-consuming measurements and adjustments are avoided. By this automatic spacing and "squaring" of the posts, i. e., the bringing of the grooved faces of adjacent posts in exact parallel relation, another important advantage is obtained, in that the mating grooves in the sills and adjacent posts are properly arranged and brought into exact registry. Hence when the slabs are fitted in position accuracy of fit is ensured, together with exact registration of the grooves in the assembled parts, enabling the fasteners to be readily applied and the grout flowed into the grooves from the top of a tier of assembled slabs to positively effect the simultaneous filling of all the registering grooves to bind and lock all of the marginal surfaces of the assembled elements together. As a result the parts of the structure may be assembled by ordinary laborers exercising only an average degree of care and intelligence with the absolute assurance that the elements will be properly and securely united and accurately fitted together with great ease and rapidity. It will be evident that the sill extensions tie the lower ends of the posts together, and thus make a stronger structure, and that they further form a base support for the tiers of slabs, on which the lower slab of each tier rests, thus more effectually sustaining the weight of the slabs and tying the units together and making a solid wall structure even with the use of comparatively light posts and slabs. The sills may therefore serve as the foundation itself when a sub-foundation is not used, and as a super-foundation to give greater strength when a sub-foundation is used. In constructing a building with a wooden floor, or other floor having supporting rafters, the sill extensions may be employed as a direct support for these rafters, thus enabling rafter sill plates to be dispensed with. In erecting the posts it is only necessary to set the anchoring portions 9 in their receiving holes or sockets and to rest the sill extensions on the leveled earth, a leveled foundation or leveled sub-sills or piers, and to form the sockets or holes without any particular regard to their depth in order to have the upper ends of the posts terminate

at the proper height or level. This follows from the fact that when the supported sill extensions are alined the posts are supported and at the same time automatically leveled. Hence in setting up the posts and bringing their sill extensions into coacting relation several time and labor-saving operations are simultaneously performed, i. e., the posts are "plumbed", "squared", "leveled", spaced, tied together, and a reinforcing and sustaining base formed, all in a single operation. It will be further apparent that by the provision of the sill pieces or projections from the posts, which extend between the posts and beneath the tiers of slabs, the weight of the slabs is substantially sustained by the base support thus produced and removed from the grout or cement binder, thus relieving the binder from the strain of the weight of the slabs and more thoroughly ensuring the solidity and integrity of the structure. With this construction the weight of the slabs resting upon the sills of the posts tends not only to hold the parts assembled by reason of their weight, irrespective of fastening means between them, but, in the event of the recession of the earth beneath any portion of the building, sagging of the overlying posts will be prevented, inasmuch as by the joining of the posts by the sill projectings and, through the weight of the slabs resting upon said sill projections, the parts of the structure will be held rigidly in alinement.

While the structural details herein set forth are preferred, and the structure illustrated embodies the means best known at this time for carrying my invention into practical effect, it will of course be understood that the invention is not limited to the particular details of construction specified for purposes of exemplification, but that modifications falling within the scope of the invention as specified in the claims may be made without departing from the spirit or sacrificing any of the advantages of the invention.

I claim as my invention:

1. A concrete structure including a body having side walls formed of posts, main slabs, and top slabs having upper inclined edges forming a sloping top surface, supporting strips laid upon said sloping top surface, transverse stringers supported by said strips, roof supporting members laid upon said stringers, and transverse filler bars at the ends of the body between said supporting strips and the level of the upper edges of the main slabs of said side walls.

2. A concrete structure including posts having anchoring and sill portions, the latter being extended laterally to form a portion of the base of the structure and having their outer ends reduced, connecting elements having reduced ends in interlapping relation with the reduced ends of said sill portions, main slabs mounted between said posts, top slabs having their upper surfaces sloping, and a roof structure supported upon said top slabs.

3. A concrete structure comprising posts having vertical grooves and including anchoring and sill portions, the latter being extended laterally and having grooves in their upper surfaces, slabs mounted between said posts and having marginal grooves registering with the grooves in said posts and sill portions, and a binder element in said grooves.

4. A concrete structure including molded concrete posts, each cross-shaped in its lower portion, such cross-shaped portion forming a lower anchoring end and lateral sill extensions molded therewith, and slabs arranged between the posts, said sill extensions extending between the posts and beneath the slabs and forming base supports for the latter.

5. A concrete structure including molded concrete posts, slabs arranged between the posts, sill pieces molded with the posts and extending beneath the slabs, said posts, slabs and sill pieces having their opposed faces grooved, and a binder arranged within the grooves and interlocking said parts.

6. In a building structure, a building unit comprising a molded concrete post of cruciform shape at its lower end, the vertical portion of which forms an anchoring member at the base of the post and the lateral portions of which form sill pieces disposed in the same horizontal plane and arranged at the juncture of the body of the post and said anchoring member.

7. A concrete structure including molded concrete posts, and tiers of slabs filling the space between adjacent posts, each of said posts having a lower anchoring end and arms projecting laterally from the post body at its juncture with said anchoring end, the laterally extending arms of adjacent sides of adjoining posts being arranged in alinement and extending beneath the intervening tier of slabs and forming a sill support therefor, said arms having lapping meeting ends adapted in the operation of bringing them together to simultaneously level, plumb and square said posts.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM C. FLANNERY.

Witnesses:

EVA W. SPRINGER,

BENNETT S. JONES.