March 10, 1925. 1,529,516

A. T. THORNE

CANTILEVER BUILDING CONSTRUCTION

Original Filed Nov. 11, 1919

FIG. 1.

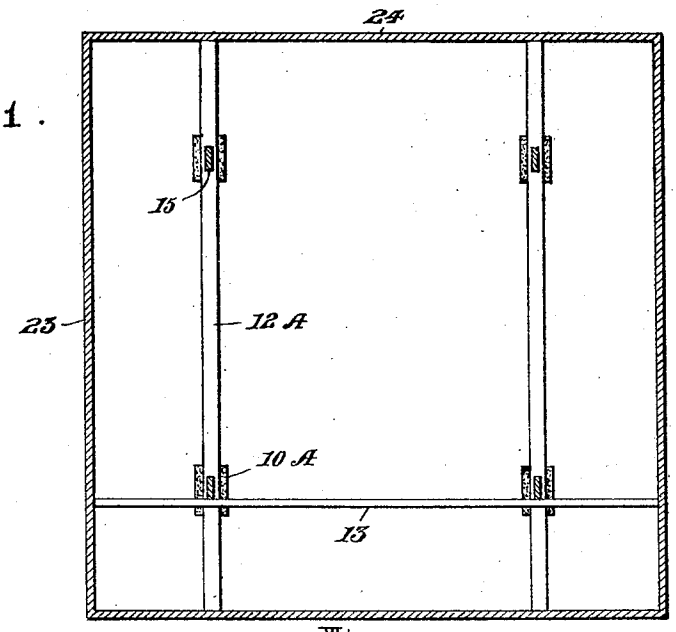


FIG. 2.

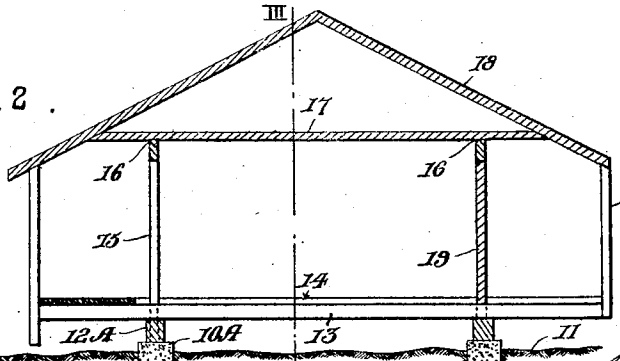


FIG. 3.

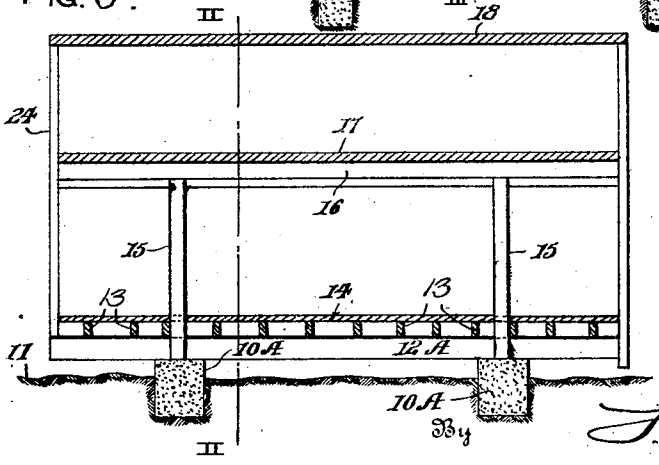
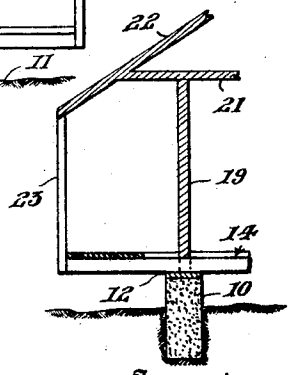


FIG. 4.



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UNITED STATES PATENT OFFICE.

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CANTILEVER BUILDING CONSTRUCTION.

Application filed November 11, 1919, Serial No. 337,304. Renewed October 7, 1924.

To all whom it may concern:

Be it known that I, ALEXANDER THOMSON THORNE, a citizen of the United States of America, residing at Tulsa, in the county of Tulsa and State of Oklahoma, have invented certain new and useful Improvements in Cantilever Building Construction, of which the following is a specification.

The primary object of this invention is the provision of a system of construction for building, by which the builder may dispense with a considerable portion of materials otherwise necessary and a large amount of labor, especially in the foundations, with a consequent decrease in expense, by so relating the various parts of the building that valuable physical properties inherent in various elements of the building, are brought into use, which properties, in the usual plan for buildings, are not as fully utilized, and as a further consequence, large and small buildings may be easily and quickly erected, upon a strong foundation, at less cost and with increased strength.

The principle involved in my system of building construction is that of a cantilever beam, continuous over two or more supports, and preferably so arranged that the floor members will support a greater load than simple beams over the same area, or the same load over a greater area, and so arranged that the weight of the ceiling, roof and other superstructure, is carried by the foundation and interior walls or columns of the building, with a consequence that outer walls may be altogether omitted, or designed, as desired, for porches, sun parlors, etc., and if constructed, they become simple curtain walls, carrying no load other than their own weight, at a considerable saving of expense. The weight of such curtain walls may be supported by the floor construction or preferably, suspended from the roof or superstructure, or by a combination of these two methods. In other words, the principle is two-fold. As to the foundation, the floor members in one method of utilizing my invention are themselves cantilevers and are supported by other cantilever members which support greater weight for the same size beam, or the same load on a larger span. In another method of utilizing the first principle of my invention, the first floor construction is composed of cantilever members supported directly on the foundation walls; secondly, in one method of utilizing the second principle of my invention, the entire weight of the roof or superstructure is borne by the foundation and interior walls and columns of the house, preferably without carrying any of the load on the floor construction and relieving from the outer walls, all stress of supporting the upper stories, superstructures, and roof members, thereby permitting glass or light exterior curtain walls, or omitting them entirely. In another method of utilizing my invention, especially where the foundation walls are used across the ends, the outer end walls may be used to support part or all of the superstructure, preferably without allowing any of the load to be carried by the first floor construction. My invention consists of utilizing either one, or both, of these principles of construction. For a small building the foundation consists of two parallel rows of supports such as posts, or two continuous walls, where three rows or walls are now generally required, thereby greatly diminishing the expense as well as the time required in constructing the foundation. Foundation walls across the ends are not necessary with this system, but may be used in connection with it, to inclose basements, cellars, area-ways, etc.; moreover, in my system of building construction, the parallel rows of supports, or parallel foundation walls, need not be spaced as far apart as the width of the building, and therefore, even if end walls are used, considerable expense for material and labor is saved.

In this method of construction, the floor is securely laid upon the cantilever members, which constitute the floor joists, and by reason of the cantilever construction, the floor is less likely to warp or sag. The interior walls, columns, or other supports, which will carry all of the weight of the roof or superstructure, are placed directly over the foundation walls or rows of supports. The weight thereof may be carried by the floor members, but preferably the columns, uprights, or other members which are to carry the weight of the superstructure, will be carried directly to the foundation members through necessary holes in the floor. In other words, such columns and uprights may rest directly upon the cantilever members or preferably may be carried along the side of, or between, the cantilever members which form the floor joists directly to the foundation.

In like manner, my invention may be so

adapted, that the roof or ceiling beams may be similarly fulcrumed on, or secured to, the uprights, interior walls, or columns extending to the foundation walls, and additional stories or superstructures may also be carried on the same columns. In each instance, the uprights, or interior walls or columns of the building carry the entire weight of the ceiling, roof, superstructure, or additional stories. The outside walls carry only their own weight.

The invention is therefore adapted to roof construction as well as floor construction.

One method of utilizing my invention, especially in a wood frame building, saves considerably more labor by reason of the fact that parts of the structure are so arranged that standard commercial lengths and sizes of material may be used in the work, as they come direct from the dealer, without the necessity of cutting for lengths or squaring the ends. These lengths may be utilized by appropriate method of joining (splicing) so that a continuous cantilever beam is created without the necessity of squaring the ends.

Similarly the entire invention is adaptable for many kinds of material in construction and may be of timber or may be fire-proof throughout, or of any combination of suitable building material.

With these general objects in view, and others that will become apparent as the nature of the invention is better understood, the following description is given:

My invention consists in the novel form, combination, construction and arrangement, of the elements and parts of buildings, above referred to, and hereinafter more fully described and then claimed.

In the drawings, forming a part of this application and in which like reference characters designate corresponding parts throughout the several views, Figure 1 shows a horizontal sectional view through a building construction formed after the manner of my invention with the floor 14 removed. Figure 2 is a vertical sectional view of the building shown in Figure 1, and taken upon the line 2—2 of Fig. 3. Figure 3 is a vertical section of the same structure as Figure 2 taken upon the line 3—3 of Figure 2. Figure 4 is a vertical sectional view of a different manner of carrying out the invention.

In the said drawings, the earth is represented by 11, foundation walls by the numeral 10, foundation posts by 10^A, upright columns or posts by 15, interior walls by 19, end walls by 24, side walls by 23, roof members by 18 (and 22 in Fig. 4) beams by 12, 12^A, 13, 16 and 21, and the flooring by 14.

Referring more in detail to the drawings, my invention primarily consists in the provision of two or more parallel foundation walls 10 in Figure 4, or parallel rows of foundation posts such as concrete blocks 10^A in the other figures, firmly mounted on or sunk in the earth 11. The posts 10^A when used will preferably be rectangular on horizontal section with the larger dimensions running in the same directions as the cantilever beams 12^A as in Figure 1.

In this method of utilizing my invention, the said foundation posts 10^A, with the cantilever beams 12^A mounted thereon, as shown in Figure 1, will be the equivalent of continuous foundation walls such as 10, in Figure 4, and said foundation walls 10 in Figure 4, or combination of foundation posts 10^A and cantilever beams 12^A, constitute, and are hereinafter referred to as, the foundation members.

Cantilever beams 13, traverse the tops of the said foundation members, (10, or 10^A and 12^A), and extend outward so that the free ends of the said beams 13, are some distance outward of, and beyond the said foundation members. The said cantilever beams 13, when material such as wood, is used, constitute the floor joists for supporting the flooring 14, and, when such material as concrete is used may be integral with the floor, and may be used in the same horizontal plane with the cantilever beams 12^A, instead of being mounted thereon, when the building material renders such construction desirable.

The said foundation walls 10 or foundation posts 10^A with cantilever beam 12^A mounted thereon, will preferably be so spaced as to give the maximum strength to the floor joists 13, when used as cantilevers, but said foundation members 10, 10^A, and 12^A, may be brought closer together, or spaced further apart, as may be desirable in the building operation.

In the drawings, only two parallel rows of foundation posts 10^A, in Figure 1, are shown. For convenience in building, where a larger foundation is desirable, more than two rows may be employed. In such case, the beams will be mounted on such additional foundation members in the manner described above, with floor joists placed thereon and extending beyond the area outlined by the foundation members in which event, the floor joists become the cantilever members which embrace the spirit of this invention. Or in the event of construction with such material as reinforced concrete, such cantilever members may be integral with the floor which will extend outward and beyond the area outlined by the said foundation members.

Uprights or columns 15 are preferably mounted directly upon the foundation walls or posts by any appropriate building method, or, they may be placed upon the cantilever beams 12^A or 13 by any appropriate method of building construction.

Referring now to the second principle of my invention; in one method of utilizing same, these columns 15 will carry the entire weight of all upper-stories, superstructures, or roof, as the case may be. The interior walls 19 may be curtain walls, supporting no weight, except their own, or may be omitted as desired, or the weight of the upper-stories, roof, or superstructure may be distributed along the length of the foundation members by such interior walls 19 and appropriate spacing of uprights or columns 15.

The said uprights or columns 15 support the upper beams 16 in cantilevered position upon their respective summits, or, at any desired height, by a joint, appropriately adapted to the reception of a ceiling 17, and the roof 18, as in the case of the one-story buildings shown in the figures. In the case of a building of more than one-story, the weight of the second floor and others, if desired, will be cantilevered at the desired height upon the several upright posts or columns 15, by any appropriate building method, and the weight of additional stories, superstructures, or roof members will be carried by increasing the length of these uprights or columns. The floor of such upper-stories, if any, will be cantilevered in the manner first above described for the floor of the first story, by the use of cantilever beams 16 and floor joists mounted transversely thereon, in the same manner and corresponding with the cantilever beams 12^ and floor joists 13 in the first floor, or in the use of such building material as reinforced concrete, such cantilever beams and posts may be integral with the floor in the same horizontal plane, and extending beyond the area outlined by the uprights or columns 15.

The side walls 23, and the end walls 24, or either of them, may be entirely omitted, as in the case of porches, or may be curtain walls of light construction, for the reason that no weight will be carried by them except their own. Such walls 23, may preferably be suspended from the roof or superstructure members, as shown in Figures 2 and 4, or may be supported from below, or a combination of these two methods may be employed.

In another method of utilizing my invention, especially where foundation walls are used across the ends of the building, the end walls 24, may be used to support part or all of the superstructure in conjunction with, or independently of, interior walls 19, or columns 15 without changing the method of first floor construction.

In Figure 4, I have illustrated an interior wall 19 supported above the foundation wall 10 with the ceiling 21 mounted after the manner of a cantilever, upon the wall 19, supporting the roof member 22. Interior walls such as 19 may be employed instead of columns 15, in the structures shown in Figures 1, 2 and 3 of the drawings.

While the forms of the invention herein described are believed to be the preferable embodiments thereof, it is understood that minor changes may be made in the form, combination and arrangement of the parts without departing from the spirit and scope of the invention as claimed.

Having thus described my invention what I claim is new and desire to secure by Letters Patent is:

1. In a building, a plurality of spaced sets of foundation piers, main floor beams each extending across the tops of a set of the foundation piers and projecting at its ends beyond the end piers of the set, floor joists resting on and extending across the main floor beams and having their ends terminating outwardly of the main floor beams, side walls depending adjacent said main floor beams and floor joists at the extremities thereof, vertical posts supported by said foundation piers, beams connecting the upper ends of said posts, roof joists carried by said beams, and a roof supported on said roof joists and having its outer portions carrying said side walls.

2. In a building, a plurality of spaced sets of foundation piers, main floor beams each extending across the tops of a set of the foundation piers and projecting at its ends beyond the end piers of the set, floor joists resting on and extending across the main floor beams, and having their ends terminating outwardly of the main floor beams, a floor carried by said floor joists, vertical posts supported by said foundation piers, beams connecting the upper ends of said posts, roof joists carried by said beams, a roof supported on said roof joists, side walls carried jointly by said roof joists and by said floor joists, end walls and interior walls supported by the floor joists main floor beams.

In testimony whereof I affix my signature.

ALEXANDER THOMSON THORNE.