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COMPLETE SPECIFICATION.

Improvements in the Construction of Iron Buildings.

I, LEROY S. BUFFINGTON, of the City of Minneapolis, in the County of Hennepin and State of Minnesota, United States of America, Architect, do hereby declare the nature of my said invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

- 5 My invention relates to fire-proof buildings composed chiefly of iron : and the objects of the invention are mainly, First, the construction of an iron building in a manner that will practically obviate undue expansion and contraction during the extremes of heat and cold ; Second, a novel construction and arrangement of the main structure and of the stairs and elevator shafts whereby there is attained
10 the necessary strength and stability together with compactness and the utilization of the space to the best advantage, and Third, an improved plan of floors and means of bracing the iron beams in fire proof floors in such structure.

The invention consists in the novel construction and combinations of parts herein-
15 after fully described and particularly pointed out in the claims ; and the improvements are illustrated in the accompanying drawings, in which—

Fig. 1, is an elevation of a building embodying my improvements.

- Fig. 2, is a central vertical sectional elevation of the same, on the plan indicated by the lines V—V of Fig. 3, 4 and 5 ; Figs. 3, 4 and 5 are plan view on the lines V¹ V¹, V²—V², and V³—V³, respectively, of Fig. 1 ; Fig. 6 is an enlarged floor
20 plan on the line V²—V² of Fig. 1 ; Fig. 7 shows, on a still larger scale, the arrangement of stairs and elevators in Fig. 6 ; Figs. 8 and 9 are sectional views of the stairs on the lines W—W and W¹ W¹, respectively, of Fig. 7 ; Fig. 10 is a perspective view of a portion of the building wall, showing in detail the construction and arrangement of the parts, and also the floor construction ; Fig. 11 shows the wall construction
25 in horizontal section ; Figs. 12 and 13 also show the same in vertical sectional and front views, respectively, and on a larger scale ; Fig. 14 is a vertical sectional view (enlarged) of the floor on the line x—x of Fig. 10 ; Fig. 15 is a front elevation of a portion of the wall framing and Fig. 16 shows in elevation one of the interior columns serving as floor supports. Figs. 17 and 18 are front elevations of two of the posts
30 and the girts and beams, showing different modes of arranging the parts ; Fig. 19 is a perspective view from the exterior of a portion of a post, the girts, beams, angle plates and shelf for the veneer ; and Fig. 20 is a perspective view (enlarged) of a

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portion of one of the posts showing the manner of securing the plates and breaking joints.

In the several views A. A. designate laminated framing-posts composed of plates of iron or steel laid together so as to break joint and secured together by bolts or rivets *a*¹. The plates should be relatively long and those for the lower portion of the posts of unequal length, so that as other plates are added they may over-lap and break joint throughout the entire length of the structure. The posts are made to suitably diminish in thickness for the successive stories by omission of an outer plate *a*, at proper intervals, so that the central shape of the posts will be tapering from foundation to roof; and they can of course be constructed in this manner of any desired height, regard being had to the size and proper proportioning of the plates in the structure, and thus form, when braced, a continuous skeleton of frame extending from bottom to top of the structure.

The framing-posts A are braced by diagonal braces B in the bays between the windows, and by horizontal braces B¹ in the bays in which the windows are placed. They are also connected at each floor by horizontal girts C which extend entirely around the structure and are made continuous by connecting their ends by fish plates or by overlapping and riveting, and are fastened to the posts by angle plates *c*, and the framing is further connected and strengthened by a system of horizontal ties, D, at each floor, which also form a part of the floor support both longitudinally and transversely. These ties D have one end fastened to the posts A and the other end fastened to a tie D extending in transverse direction, and a rectangular opening E is thus formed in the centre of the structure. At the junction of the ties, and at such other intervals as may be necessary, are columns F extending to and supporting the ties D of the floor next above. Interior walls or partitions G may be built up from the ties D to the next floor, and the space between such walls and the outer building walls may be divided by partitions H, as shown, or in such other arrangement as desired.

In the angles of the central space E are arranged the elevators I. Three elevators may be conveniently arranged in each angle, with their cable *i* operating in the interior space *e* between the elevator walls and stairs.

k, *k*¹ are double pairs of stairs placed at right angles to each other across the space intermediate of the elevators; the one *k* leading to a landing *j* midway of the story, and the other *k*¹ at right angles to the former and leading to the floor above.

The floors L are supported on the iron beams D which rest on the girts C and are connected by tie-rods *n* extending diagonally from the upper and lower portions of the beam, respectively to the lower and upper portion of the adjacent beams, as shown in Figs. 10 and 14. An arched formation of Terra Cotta or other fire-proofing material M is built in between the beams, in the usual way, and the tie-rods prevent the spreading or twisting of the beams D. The interior of the framing is covered with a fire-proof tiling O or other material, in the ordinary manner.

Around the entire exterior of the framing, except the window spaces, is a sheathing P of wire-lath or other suitable material for the inner support of a thick covering Q of mineral wood or other non-conducting substance, and this is in turn covered on its exterior surface by a second sheathing P¹ of wire lath or other suitable material.

R is an exterior veneering of stone or other suitable material, supported at each story (and at closer intervals when necessary) by shelves S that rest upon and are secured to projecting portions *c*¹ of the angle-plates *c*. And the veneering is secured at proper points by anchor-rods *t* that are made fast to the braces B B¹.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. A building having a continuous skeleton of metal, a covering of veneer, and a non-conducting packing between the skeleton and veneer, for the purpose set forth.

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2. In a building frame, a continuous diminishing laminated post, formed of layers of metal plates secured together and arranged to break joint and decreasing in number towards the top.

3. In iron building construction, the combination with a framing composed of continuous laminated posts suitably connected by braces and girts of tie-beams secured thereto and to one another, substantially as set forth.

4. In iron building construction the combination with a framing composed of continuous laminated framing-posts suitably connected by braces, of an exterior covering of non-conducting material, for the purpose set forth.

5. In iron building construction the combination with a framing composed of laminated posts suitably connected by braces and girts, of an exterior covering of non-conducting materials and a stone or other veneering exterior and supported on shelves secured to the framing, substantially as set forth.

6. In a frame for a building of two or more stories, a series of tapering posts extending from base to top of the frame and formed of metal plates in layers secured with their flat sides together, and arranged to break joint, and braces and girts for connecting and securing the posts, substantially as set forth.

7. In a building frame, a series of continuous framing posts composed of metal plates secured with their flat sides together and breaking joint, in combination with girts and tie-beams secured thereto at each floor, substantially as set forth.

8. The combination with the laminated plates, of the continuous girts secured thereto, and the tie-beams also secured thereto, and to one another, substantially as set forth.

9. The combination with the framing posts and braces, of the wire-lath or other suitable coverings, the non-conducting packing and the veneering supported by the shelves and anchor-rods, substantially as and for the purpose set forth.

10. The combination with the building frame composed of the laminated posts, girts, tie-beams and pillars, arranged to form a central wall, of the elevator shafts and stairs arranged therein, substantially as set forth.

11. The combination with the building frame constructed with a central well, of elevator shafts arranged in the corners of such well and flights of stairs rising from opposite sides of such well to a central landing, and other flights rising from said landing to the other sides of such well, substantially as set forth.

12. The combination with the posts and girts forming the outer frame, of the beams having their outer ends resting on the girts and secured to the posts and their inner ends secured to beams that are transverse to them, the pillars therefrom and the diagonal tie-rods substantially as set forth.

13. The combination with the posts and girts, of the angle-plates connecting them and forming supports, for the veneer shelves.

14. The combination with the posts and their braces, of the plates forming the shelf supports, the shelves, the veneer, and the anchor-rods, substantially as set forth.

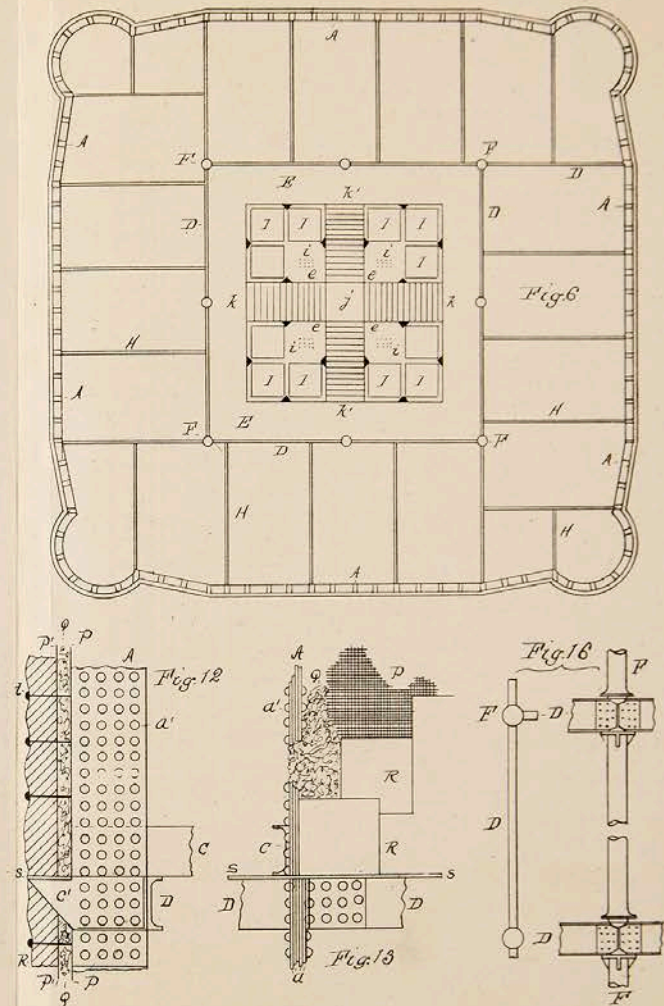
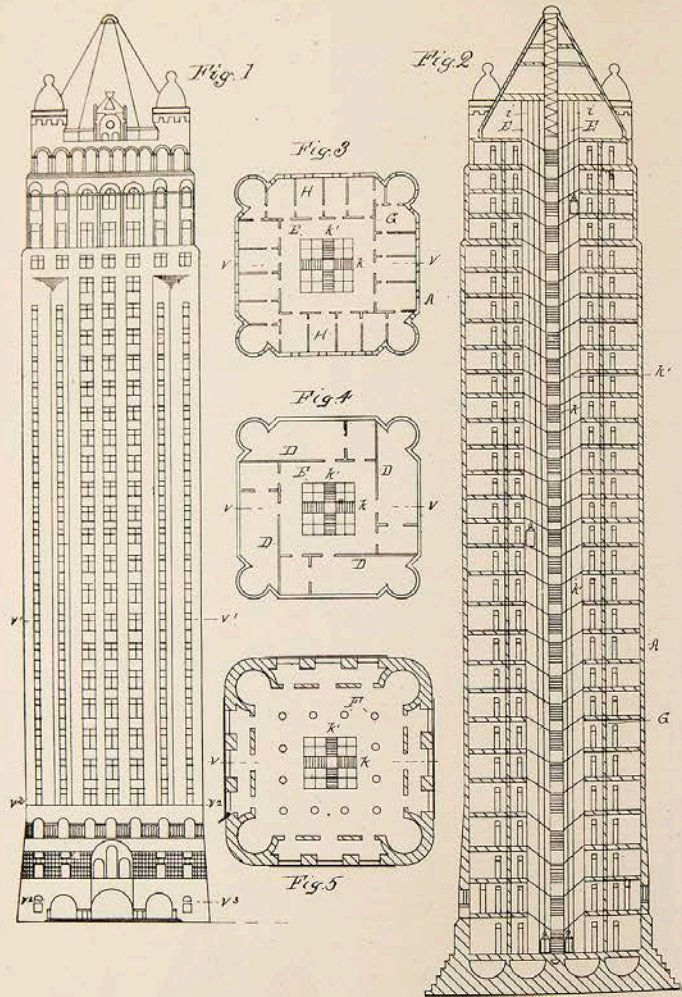
Dated this Thirteenth day of April 1888.

LEROY S. BUFFINGTON.

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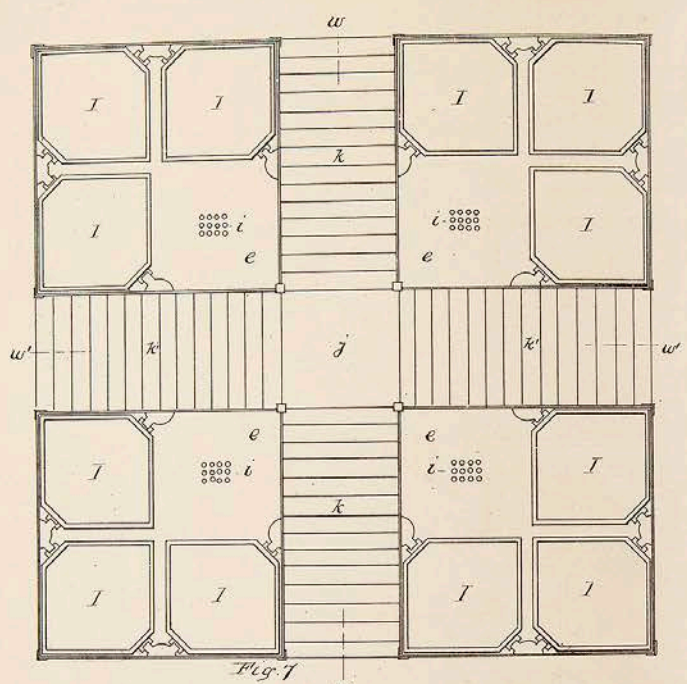


Fig. 7

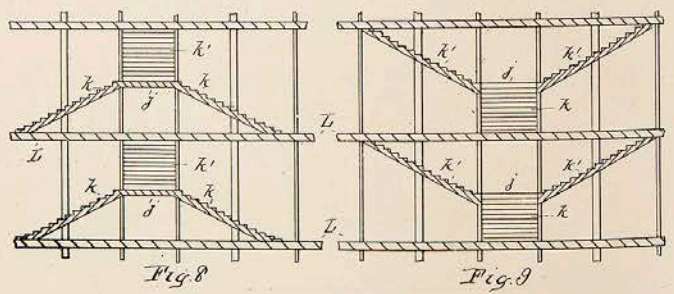


Fig. 8

Fig. 9

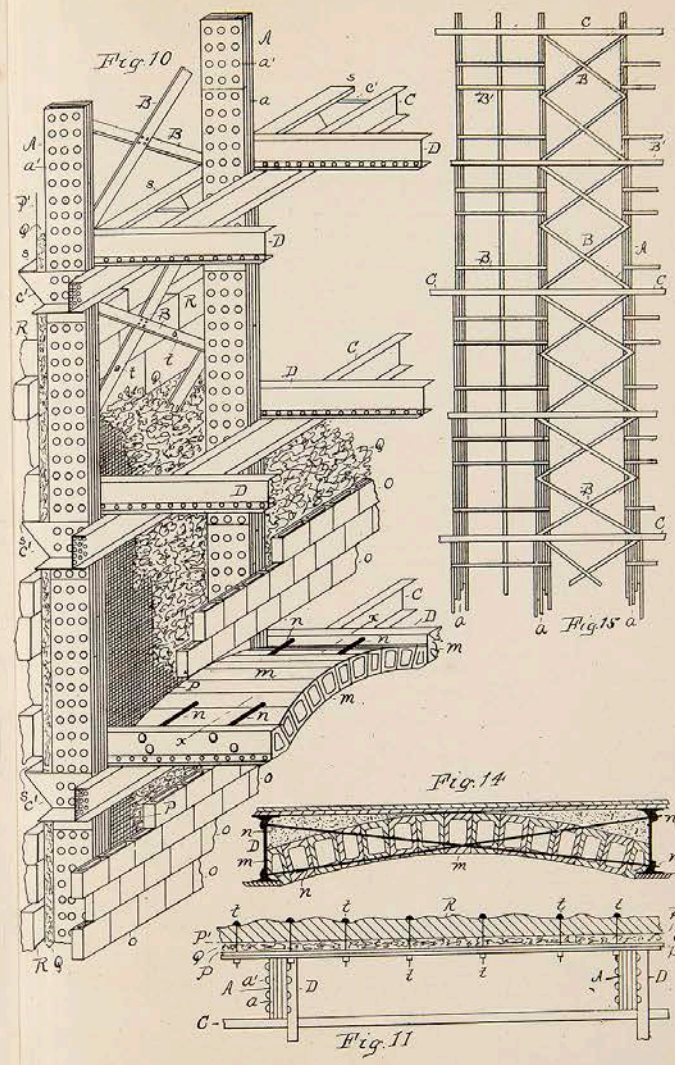
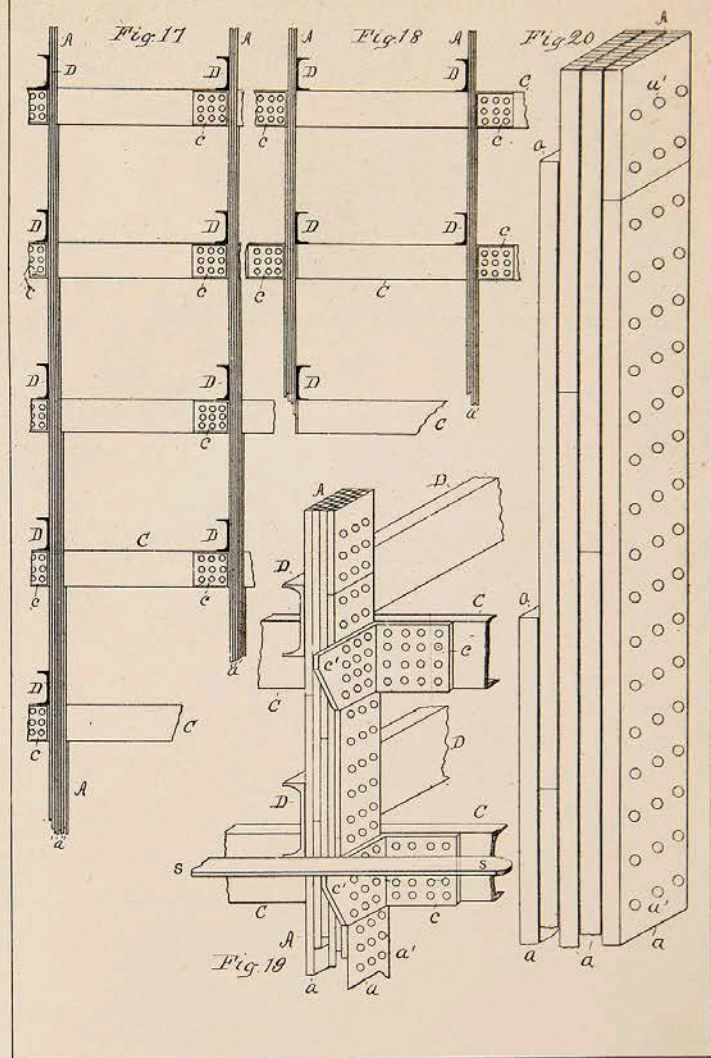


Fig. 10

Fig. 14

Fig. 11

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