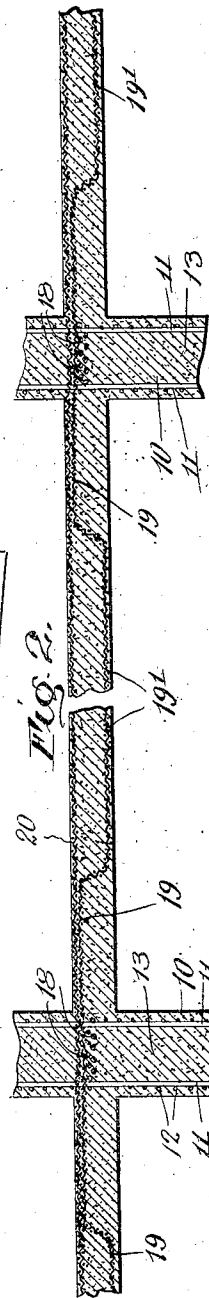
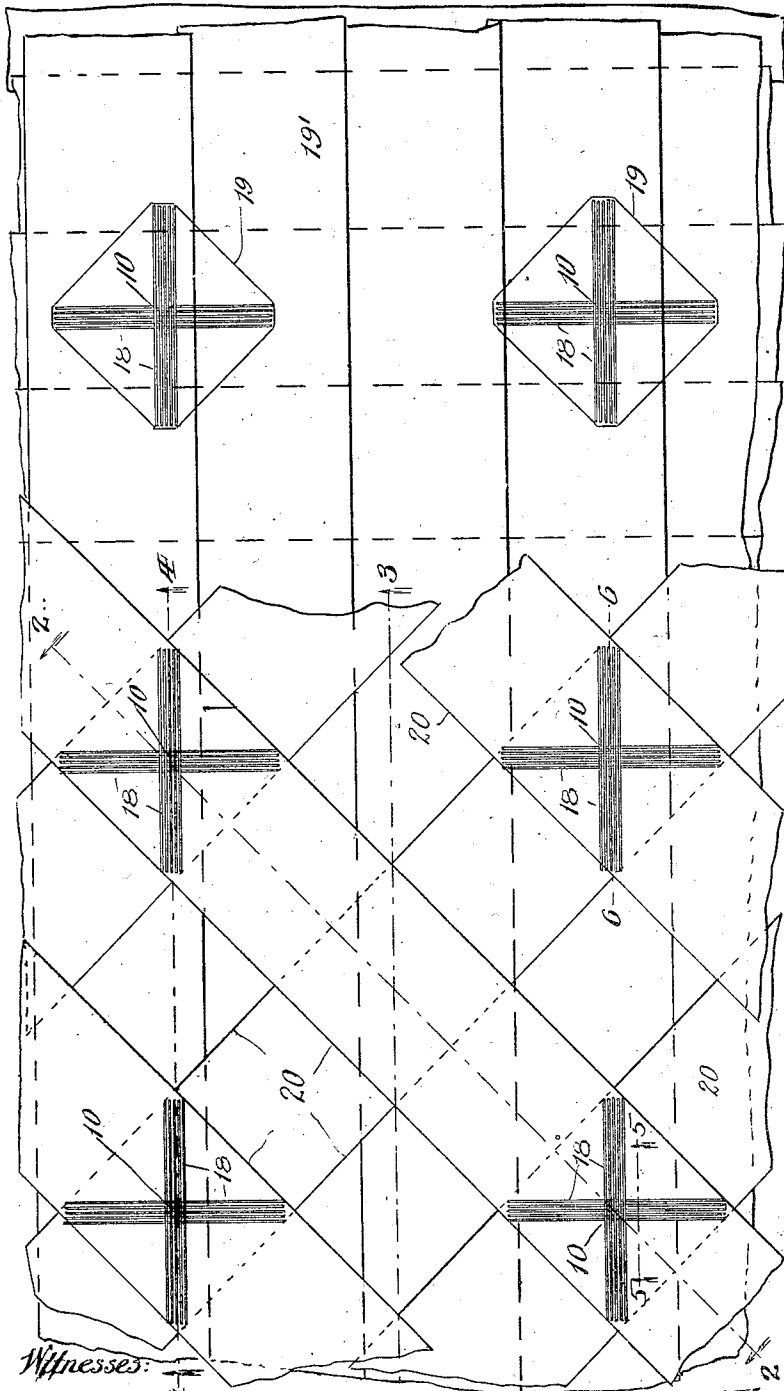


938,393.

Patented Oct. 26, 1909.

3 SHEETS—SHEET 1.



Witnesses:

Jamie F. Richards
A. E. Sherway

Fig. 1.

Inventor:

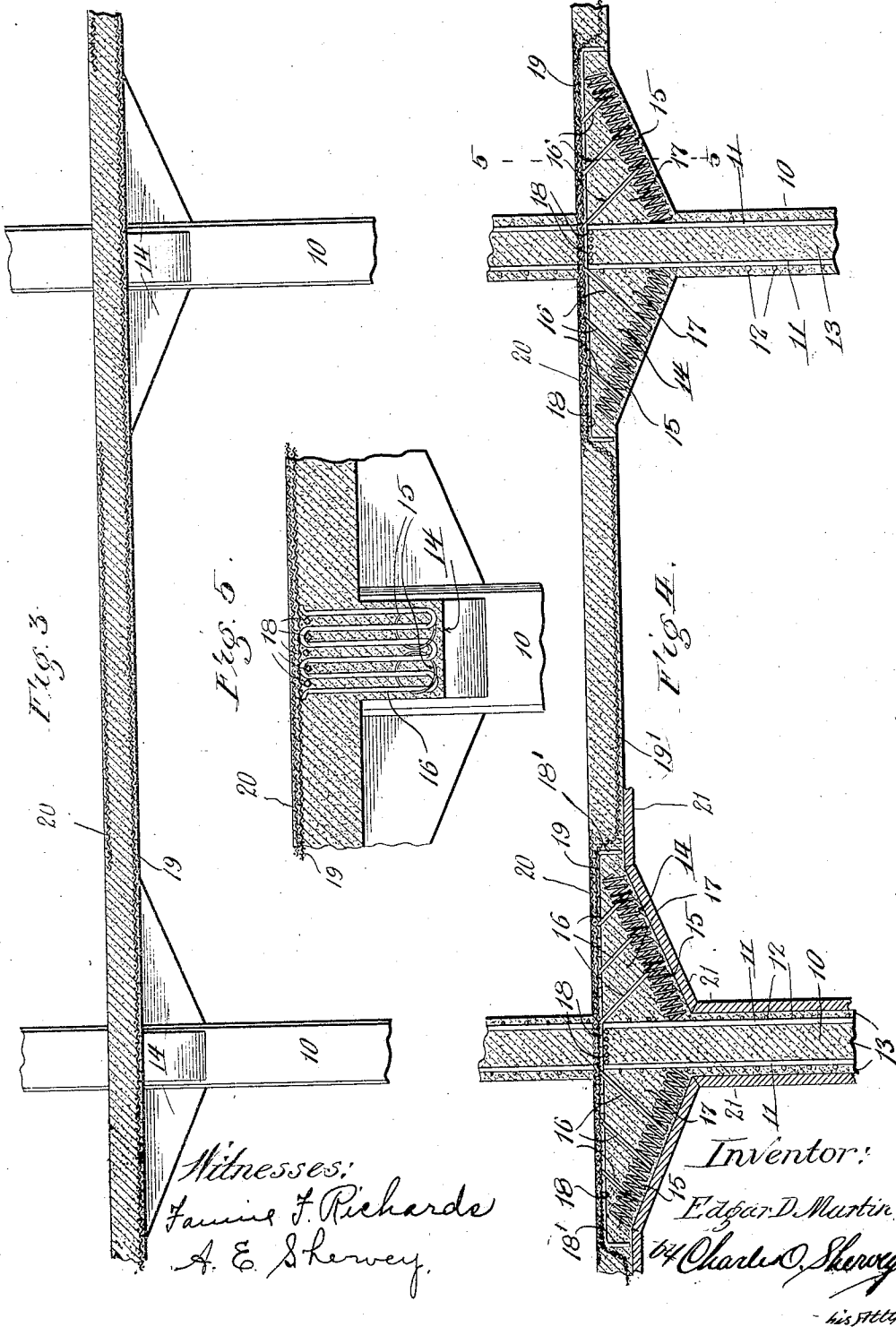
Edgar D. Martin
by Charles O. Sherway
his atty

E. D. MARTIN.
BUILDING CONSTRUCTION.
APPLICATION FILED JAN. 21, 1909.

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3 SHEETS—SHEET 2.

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3 SHEETS—SHEET 3.

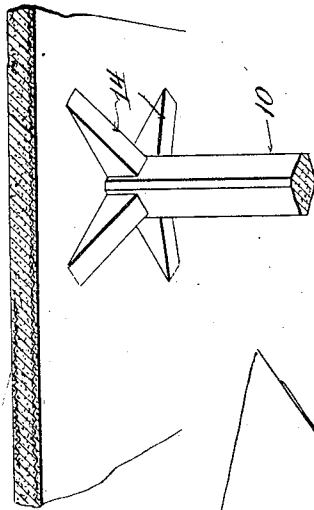


Fig. 8.

Fig. 7.

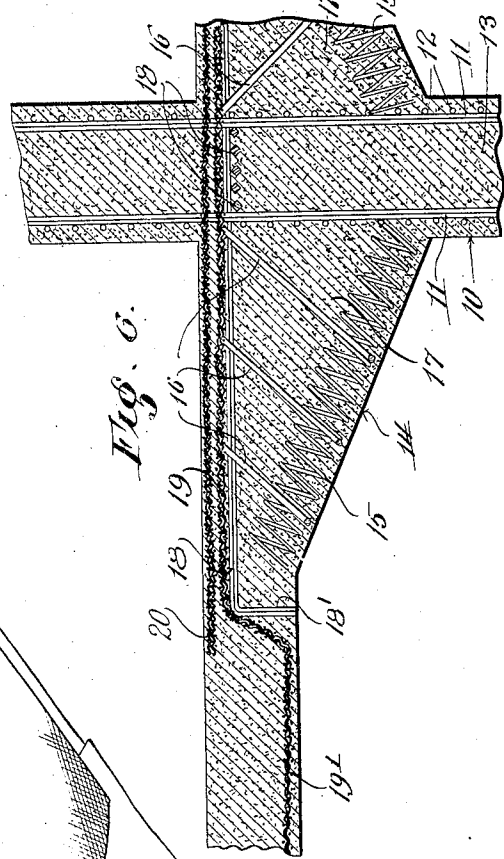
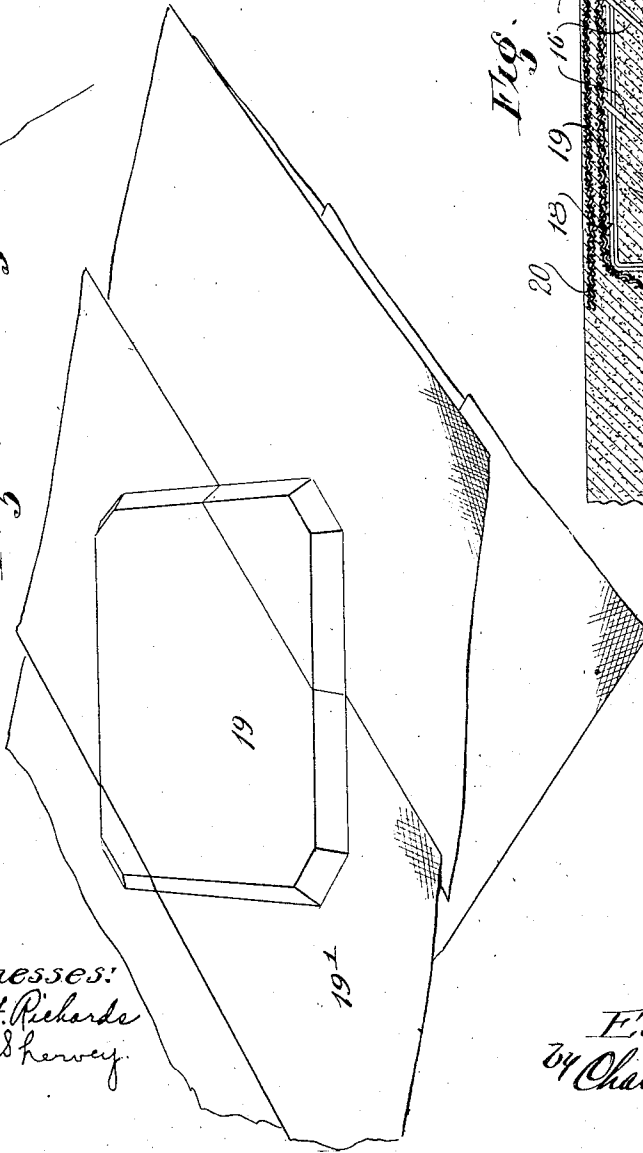


Fig. 6.

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UNITED STATES PATENT OFFICE.

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BUILDING CONSTRUCTION.

938,393

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed January 21, 1909. Serial No. 473,575.

To all whom it may concern:

Be it known that I, EDGAR D. MARTIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Building Constructions, of which the following is a specification.

This invention relates to building constructions of that type which comprise a body of concrete and metallic reinforcements embedded therein.

This invention relates more particularly to that class of building constructions in which the floor is supported wholly upon the columns or upon the columns and inclosing wall of the structure without the use of any structural steel girders, reinforced concrete girders or the like.

One of the objects of this invention is to provide an improved construction of this class which shall be light in weight, easily erected and when complete will be strong, substantial and capable of sustaining very heavy loads.

Another object is to simplify constructions of this type by minimizing and distributing the metal reinforcements in such positions that a minimum amount of metal may be employed to produce a construction which will carry as heavy loads as is borne in structures where a much greater amount of metal is employed.

To such ends this invention consists in certain novel features of construction and arrangement, a description of which will be found in the following specification and the essential features of which will be more definitely pointed out in the claims appended hereto.

The invention is clearly illustrated in the drawings furnished herewith, in which—

Figure 1 is a diagrammatic plan view illustrating one arrangement of the metal reinforcement of the caps of the supporting columns and the metal reinforcements which are laid in the floor, Fig. 2 is a vertical section taken through two columns and the floor, the line of section being indicated at 2—2 Fig. 1, Fig. 3 is a vertical section through the floor taken on the line 3—3 of Fig. 1, Fig. 4 is a vertical section through two columns and the floor taken on the line 4—4 of Fig. 1, Fig. 5 is a detail vertical cross section taken on the line 5—5 of Fig. 4, Fig. 6 is a detail vertical section taken

on the line 6—6 of Fig. 1, Fig. 7 is a perspective view of the lower floor reinforcing material and Fig. 8 is a perspective view of a fragment of a column and the floor supported thereby.

In these views 10, 10, represent a number of columns which are arranged symmetrically about the building and form the vertical supports thereof. As diagrammatically shown in Fig. 1 the columns are arranged to form squares or rectangles and are preferably arranged from about 16 to 24 feet apart, depending of course upon the general plan of the building. The construction of these columns is immaterial to my invention broadly considered, but as shown comprises vertical bars or rods 11, connecting hoops 12, and a body of concrete 13, in which said rods and connecting hoops are embedded. Any well known form of supporting column can be employed in connection with this construction. The columns are provided with widely spreading caps or brackets 14, at their intersections with the various floors and one form of cap is shown in the drawings as comprising metal reinforcements consisting of coiled wires or rods 15, and stirrups 16. The coiled rods extend transversely to the column and incline toward the floor above, whereas the stirrups preferably incline toward the column from their lower edges as clearly indicated in Fig. 4. These metal reinforcements are embedded in a body of concrete 17, and the caps or brackets in their entirety receive and support the floor upon the columns. In certain cases the coiled rods may be dispensed with or it may be found desirable to employ straight rods extending parallel with the lower inclined faces of the brackets and the stirrups may be replaced by other suitable vertical or vertically inclined metal reinforcements.

Rods 18, are placed above the caps or brackets 14, at points near the upper face of the floor, and if desired, said rods may have down turned ends 18', adapted to rest temporarily upon the wooden centers or molds in which the concrete is molded to form the floor. The preferred form of arrangement is to have the rods lie directly above the arms of the caps or brackets, although this arrangement is immaterial to my invention, as they may be arranged in various other forms, as for instance, they

might be arranged in the form of a circle around the column, but by arranging them in the manner in which I have shown them it is possible to use a lighter weight of metal and a comparatively small number of rods. In the preferred form, the rods are arranged to extend through the turns of the stirrups as clearly indicated in Fig. 5, although this is a matter of convenience in erecting the building.

A metal reinforcement, preferably metal fabric, is laid over the area bounded by the columns and in the preferred form is laid throughout the floor, except of course at points where openings are cut through the floor for elevators, stairways, and the like, and said metal fabric may consist of strips of wire mesh, expanded metal or the like, or it may comprise rods which are laid so as to form a fabric. The reinforcement takes the form of a single sheet lying in two planes, which planes are in staggered relation with respect to each other, as seen at 19, 19'. Between the brackets of the columns the reinforcement lies in the lower plane and at points where it passes over the caps or brackets 14, the fabric rises to a plane adjacent to the upper face of the floor, preferably lying upon the rods 18, as clearly indicated in Fig. 6. It is immaterial whether this fabric is above or below the rods 18, but it is essential that it be adjacent to the upper edge of the floor at the points where it extends over the caps. Figs. 6 and 7 illustrate the arrangement of the metal reinforcement 19, 19', where it will be seen that it is offset or folded down at the outer ends of the rods 18, and also folded down along the lines which extend from the ends of the rods 18, of each column. It will thus be seen that a single or unitary reinforcement sheet is employed which takes care of the tensile strains at the upper and lower faces of the floor, and that stresses at any point on the floor will be transmitted in every horizontal direction toward the brackets by the reinforcement. In certain classes of buildings no other reinforcements for the floor are necessary, but where great strength is required, it is desirable to employ a metal reinforcement which is embedded in the floor at a point near its upper face. As shown in Figs. 1 and 2, additional reinforcements 20, extend diagonally across the columns and preferably consist of strips of metal fabric of approximately the width of the caps and as shown the strips of metal fabric cover the greater portion of the floor, although I find that it is not essential to employ very heavy fabric nor is it necessary to have the fabric stretch from column to column as part may comprise loosely laid rods or wires, if desired. In erecting the building, the metal reinforcements are put in place and wooden forms 21, are then secured

around said metal reinforcements and the concrete poured in to the molds in the customary way.

It will be noticed that the reinforcements for the floor are placed only at such points as they are required, thereby reducing to a minimum the amount of metal necessary to make a floor capable of sustaining very heavy loads.

I realize that various alterations and modifications of the structure are possible without departing from the spirit of my invention, and I do not therefore desire to limit myself to the exact construction shown and described, except as may be necessitated by the prior state of the art.

I claim as new and desire to secure by Letters Patent:

1. In a building construction, the combination with columns having suitable caps, of a girderless floor supported thereby and comprising a body of concrete united with the columns and caps, and a sheet of metal reinforcement extending throughout the floor and embedded in the concrete, that portion of the reinforcement which extends between the caps being disposed near the lower face of the floor and that portion which extends over the caps being disposed near the upper face of the floor.

2. In a building construction, the combination with columns having widely spreading caps, of a girderless floor supported thereby, and comprising a body of concrete united with the columns and caps, and a sheet of metal reinforcement embedded in said concrete and extending throughout the floor between the caps in a plane adjacent to the lower face of the floor and having offset portions above the caps which lie in a plane adjacent to the upper face of the floor.

3. In a building construction, the combination with columns having widely spreading caps, of a girderless floor supported thereby, and comprising a body of concrete united with the columns and caps, and a sheet of reinforcement embedded in said concrete and extending between the several column caps in a plane adjacent to the lower face of the floor, and having offset portions above the caps which lie in a plane adjacent to the upper face of the floor.

4. In a building construction, the combination with columns having widely spreading caps, of a girderless floor supported thereby and comprising a body of concrete united with the columns and caps, and a reinforcement comprising a sheet of metal fabric embedded in said concrete, and arranged to lie in a plane adjacent to the lower face of the floor at all points between the caps and having offset portions lying in a plane adjacent to the upper face of the floor at all points above the caps.

5. In a building construction the combination with columns having widely spreading caps, of a girderless floor supported thereby, and comprising a body of concrete united with the columns and caps, and a sheet of reinforcement embedded in said concrete, and extending between the several column caps in a plane adjacent to the lower face of the floor, and having offset portions above the caps which lie in a plane adjacent to the upper face of the floor.

nation with reinforced concrete columns having widely spreading metal reinforced concrete caps, of a girderless floor supported thereby, and comprising a body of concrete and a single sheet of metal fabric reinforcement embedded in the concrete and extending throughout the floor bounded by the columns, the portions of said fabric which lie above the caps being disposed near the upper face of the floor and the portions of the fabric between the caps being depressed to lie adjacent to the lower face of the floor.

6. In a building construction, the combination with columns having widely spreading caps, of a girderless floor supported thereby, and comprising a body of concrete, a sheet of metal reinforcement extending throughout the floor and having portions disposed above the median line of the floor at points above the caps, and below the median line of the floor between the caps, and a second sheet of metal reinforcement extending between the several columns and lying wholly in a single plane above the median line.

7. In a building construction, the combination with columns having widely spreading caps, of a girderless floor supported thereby, and comprising a body of concrete, a sheet of metal fabric extending throughout the floor and having portions above the caps disposed above the median line of the floor, and the portions between the caps depressed below the median line of the floor, and a second sheet of metal fabric extending between the several columns and lying wholly above said median line.

8. In a building construction, the combination with columns having widely spreading caps, of a girderless floor supported thereby, and comprising a body of concrete, a sheet of metal fabric extending throughout the floor and being composed of fabric strips which are laid longitudinally and laterally of the building and have portions above the caps which lie above the median line of the floor, and portions between the caps which lie below said median line, and a second sheet of metal fabric composed of fabric strips laid diagonally across the caps of the several columns and lying in a plane above the median line of the floor.

9. In a building construction, the combination with columns comprising a body of concrete and metal reinforcements, and having widely spreading caps comprising a plurality of radially disposed arms composed of bodies of concrete and metal reinforcements, of a girderless floor supported thereby and

being composed of a body of concrete and two sheets of metal fabric embedded in the concrete, one sheet being disposed wholly above the median line of the floor and extending between the several columns and the other sheet extending throughout the floor and having portions above the caps which are disposed above the median line of the floor, and portions between the caps which are disposed below the median line of the floor.

10. In a building construction, the combination with columns having widely spreading caps, of a girderless floor carried thereby and comprising a body of concrete, a sheet of metal fabric extending throughout the floor and having portions above the caps lying above the median line of the floor and portions between the caps disposed below the median line, and a series of rods extending over the caps in a plane adjacent to the upper face of the floor.

11. In a building construction, the combination with columns having widely spreading caps, of a girderless floor carried thereby and comprising a body of concrete, a sheet of metal fabric extending throughout the floor and having portions above the caps lying above the median line of the floor and portions between the caps disposed below the median line of the floor and a series of rods extending over the caps in a plane adjacent to the upper face of the floor.

12. A building construction, comprising in combination, concrete columns having vertical and transverse metal reinforcements therein, concrete floor carrying arms integral with the columns, coiled rods or bars embedded in said arms and acting as metal reinforcements for the arms, and a metal reinforced, concrete girderless floor slab integral with the columns and arms.

13. A building construction, comprising in combination, concrete columns having vertical and transverse metal reinforcements therein, concrete floor carrying arms integral with the columns, metal reinforcements for said arms, comprising coiled rods or bars and stirrups embedded in said arms, and a metal reinforced, concrete girderless floor which is integral with the columns and arms.

In witness whereof I have hereunto subscribed my name at Chicago, Illinois, this 16th day of January A. D. 1909.

EDGAR D. MARTIN.

Witnesses:

CHARLES O. SHERVEY,
FANNIE F. RICHARDS.