A. J. MEIER.

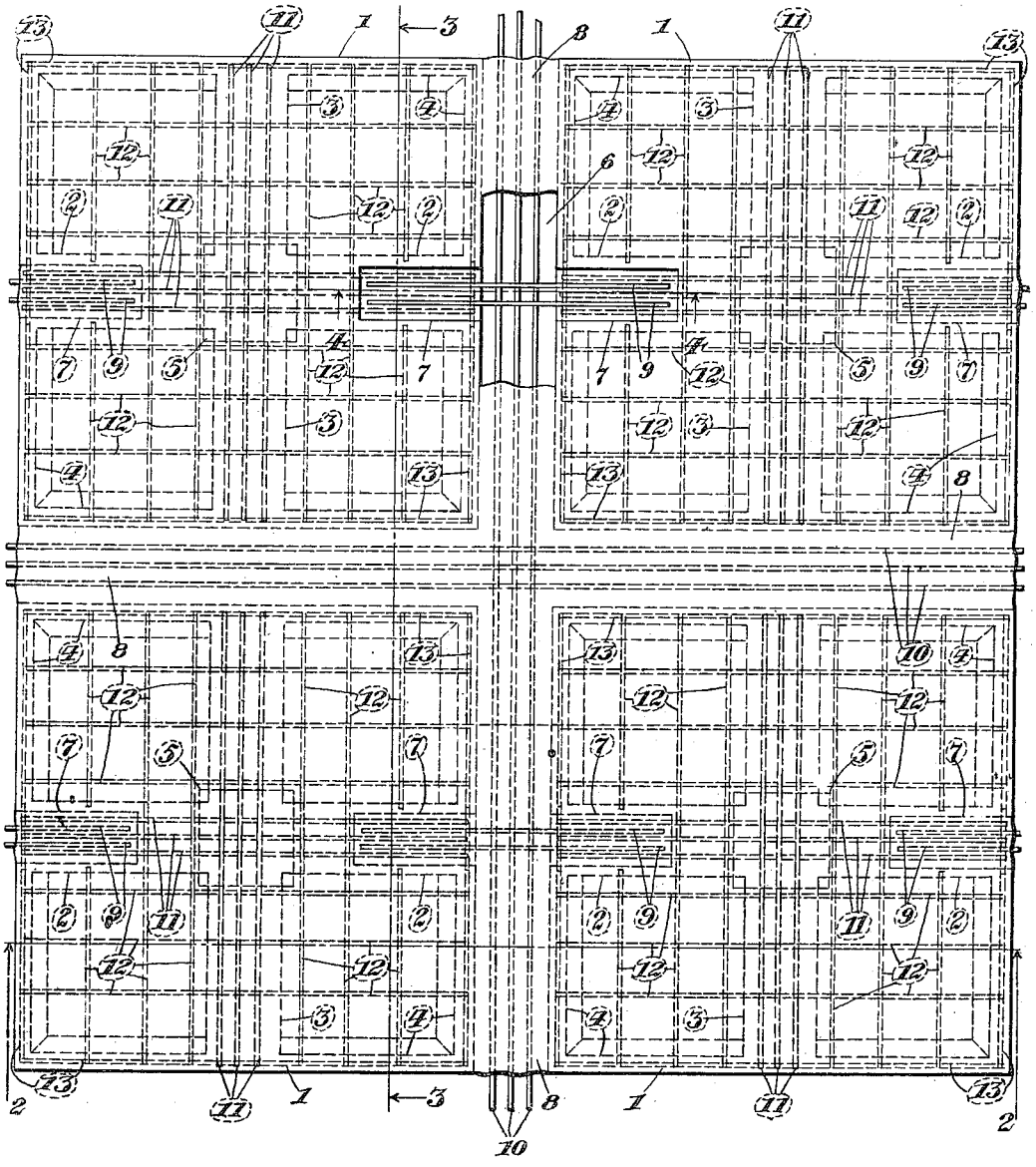
CONCRETE CONSTRUCTION.

APPLICATION FILED NOV. 16, 1909.

961,630. Patented June 14, 1910.

3 SHEETS—SHEET 1.

FIG. 1.



Witnesses:
Chas. A. Becker,
George G. Anderson.

Inventor:
Albert J. Meier,
By Hugh K. Wagner
His Attorney

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3 SHEETS—SHEET 2.

Fig. 2.

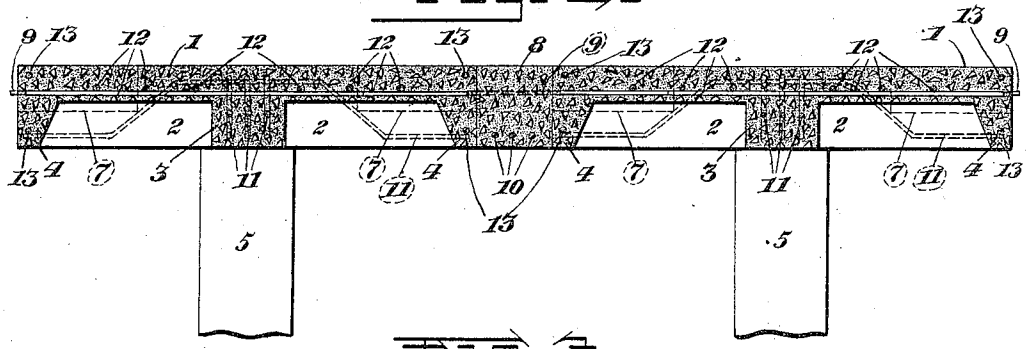


Fig. 3.

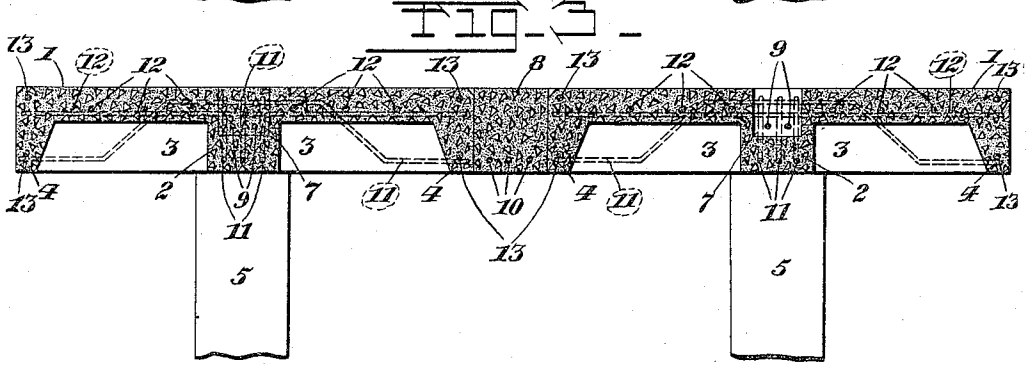


Fig. 5.

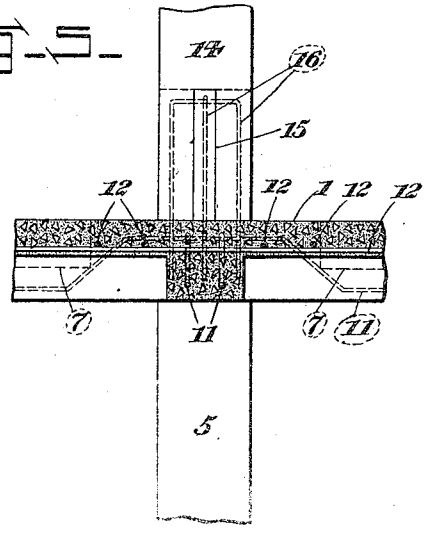
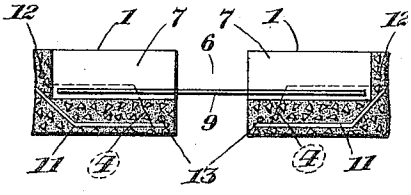


Fig. 4.



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3 SHEETS—SHEET 3.

FIG. 6.

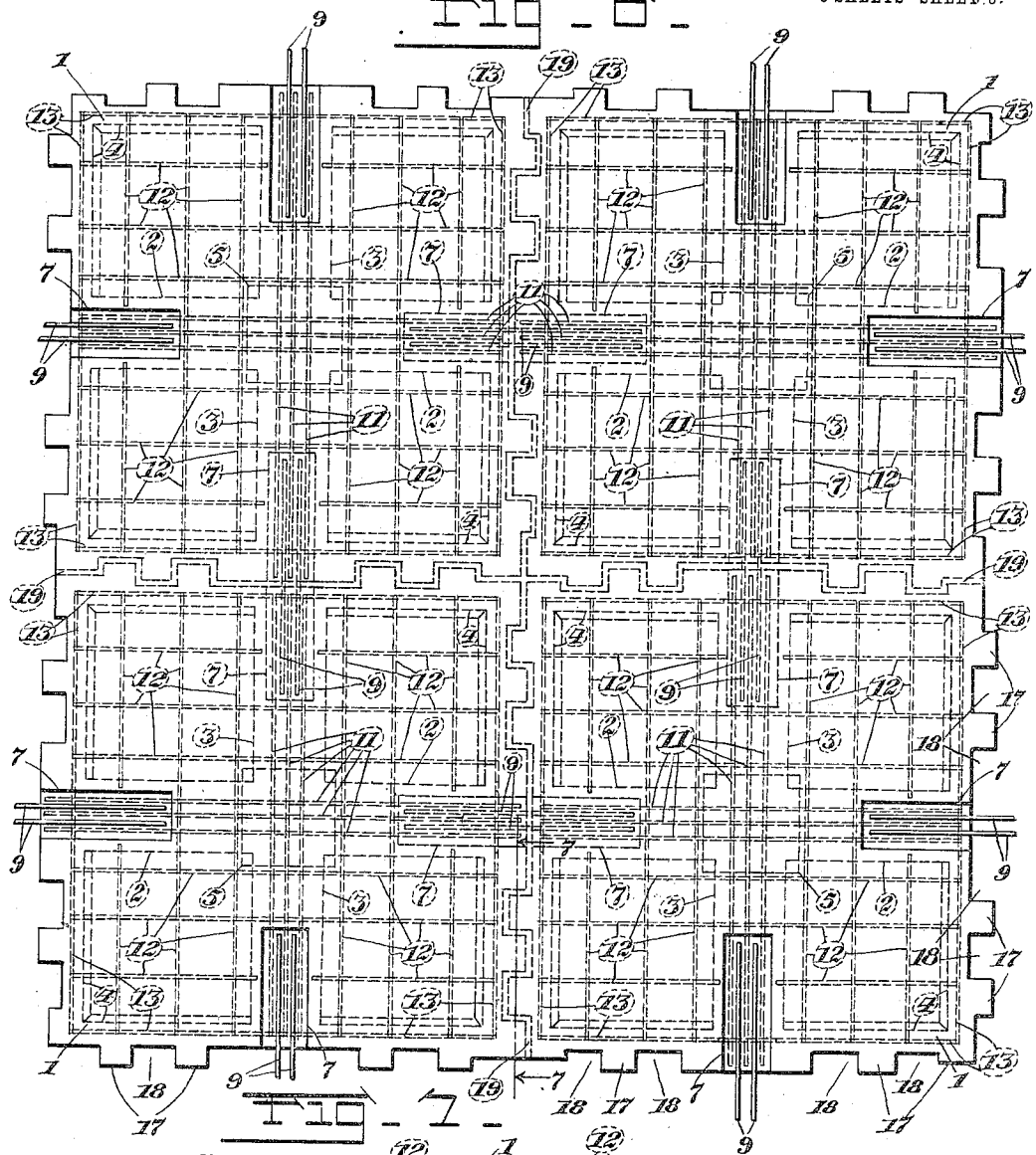
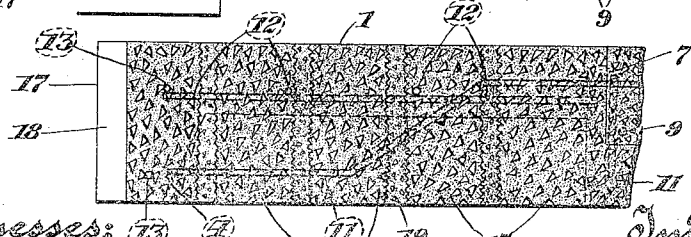


FIG. 7.



Witnesses:
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George G. Anderson.

Inventor:
Albert J. Meier,
By Hugh K. Wagner,
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# UNITED STATES PATENT OFFICE.

ALBERT J. MEIER, OF GLENDALE, MISSOURI. ASSIGNOR TO UNIT CONSTRUCTION COMPANY, OF WILMINGTON, DELAWARE. A CORPORATION OF DELAWARE.

## CONCRETE CONSTRUCTION.

961,630. Specification of Letters Patent. Patented June 14, 1910.

Application filed November 16, 1909. Serial No. 528,273.

*To all whom it may concern:*

Be it known that I, ALBERT J. MEIER, a citizen of the United States, residing at Glendale, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Concrete Construction, (Case B,) of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to concrete building structures and refers particularly to a construction in which concrete slabs are used for ceilings and floors and are supported at or near their centers by uprights or columns.

It is the object of this invention to provide a structure of concrete building elements which are united in the manner hereinafter more fully described to form a rigid, secure and unitary structure.

In the drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a plan view; Fig. 2 is a sectional view on the line 2—2, Fig. 1; Fig. 3 is a sectional view on the line 3—3, Fig. 1; Fig. 4 is a sectional view on the line 4—4, Fig. 1; Fig. 5 is a sectional view showing a slab between a pair of superposed columns; Fig. 6 is a plan view of an alternate form of slab; and Fig. 7 is a sectional view on the line 7—7, Fig. 6.

Each slab 1 is molded with any desired configuration and is provided with a beam 2 and with a beam 3. Said beams, which are formed on the under side of said slab, preferably extend at right angles to each other and intersect each other at or near the center of said slab. A flange 4, which is also formed on the under side of said slab is preferably of the same thickness as said beams, but can be of greater or less thickness than said beams, as may be desired. Each slab 1 is placed upon a column 5 so that the point of intersection of said beams rests on said column. When each adjoining slab 1 is similarly placed upon a column 5, a space 6 is left between each pair of adjoining slabs. Beam 2 under each slab alines with a beam 2 under a slab adjacent the end thereof, and beam 3 under each slab alines with a beam 3 under a slab adjacent an end thereof. Each end of beam 2 is provided with a pocket 7, and, when each slab 1 is placed upon a column 5 in the manner hereinabove described, the pockets in the adjoining ends of beams 2 aline with each other and communicate with space 6. A so-called form (not shown in the drawings) is placed underneath opening 6 between adjoining edges of said slabs 1, and grout or wet concrete is poured upon said form and into space 6 and, also, into pockets 7 in the ends of beams 2. The concrete or other mixture in space 6 is leveled off flush with the surface of slabs 1, and, when it sets, forms beam 8 between each pair of adjoining slabs and unites said slabs integrally together, thus constituting a unitary structure. When the concrete is poured into space 6 to form beam 8, it is, also, poured or runs into the pockets 7 in beams 2 opening into said space 6, which, when set, unites each pair of beams 2 integrally together to form a continuous beam. As an additional strengthening means, bars 9 are laid in pockets 7 and extend across space 6 prior to the pouring of the wet concrete thereinto to form beam 8. Bars 10 are embedded in each beam 8 and preferably lie near the bottom surface thereof.

Reinforcing bars 11 preferably lie near the bottom surface of beam 2 and beam 3 at each end thereof, but, adjacent the intersection of said beams, each bar 11 bends upwardly and extends near the top surface of slab 1 over the point where said slab is supported by a column 5, because at that point the greatest stress is near the top surface. Reinforcing bars 12 lie near the bottom surface of slab 1 and the bars 13 are embedded in each flange 4.

When a column 14 is superposed over column 5, in the manner shown in Fig. 5, a pair of slots 15, which preferably intersect each other, is formed in the bottom of said column 14. A pair of bars 16 having their ends set in slab 1 projects above said slab. When said column 14 is placed in position over column 5 and rests on slab 1, each bar 16 enters a slot 15. Said slots are then covered with forms (not shown in the drawings) and filled with grout or wet concrete, which sets therein and unites said column 14 and slab 1 integrally together.

In the alternate form of slab 1, as shown in Fig. 6, each slab is provided with a toothed perimeter, each tooth 17 of which fits into a depression 18 between adjacent teeth 17 of an adjoining slab 1. In this form of slab 1 each end of beam 3 is, also, provided with a pocket 7. The beam 8 is

omitted entirely and the narrow space 19 between said slabs is filled with grout or wet concrete, which, also, enters each pocket 7. Said slabs are thus united integrally together when said grout or wet concrete sets in said space and pockets, and form a unitary structure. The edges of the teeth 17 are preferably roughened as depicted in Fig. 7, thereby affording a better bonding surface for the concrete in said space.

I claim:

1. A concrete structure comprising a pair of slabs, each of said slabs having a pair of beams formed integrally therewith, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said alining beams being each provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said pockets and space, said slabs constituting a unitary structure when the concrete filler in said pockets and said space has become set.

2. A concrete structure comprising a pair of slabs, each of said slabs having a pair of intersecting beams formed integrally therewith, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said alining beams being each provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said pockets and said space, said slabs constituting a unitary structure when the concrete filler in said pockets and space has become set.

3. A concrete structure comprising a pair of slabs, each of said slabs having a pair of intersecting beams formed integrally therewith, the beams of each of said pairs being disposed at right angles to each other, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said alining beams being each provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said pockets and space, said slabs constituting a unitary structure when the concrete in said pockets and space has become set.

4. A concrete structure comprising a pair of slabs, each of said slabs having a pair of intersecting beams formed integrally therewith, a pair of columns, the point of intersection of each pair of intersecting beams resting on one of said columns, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said alining beams being each provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said pockets and said space uniting said slabs integrally together.

5. A concrete structure comprising a plurality of columns, a plurality of slabs, each of said slabs having a pair of intersecting beams formed integrally therewith, the point of intersection of each pair of intersecting beams resting on one of said columns, the beams of each slab alining with a beam of an adjoining slab, each end of one of said beams of each slab being provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in each of said pockets and extending across said space, and a concrete filler for said pockets and space to unite said slabs integrally together.

6. A concrete construction comprising a plurality of columns, a plurality of slabs, each of said slabs having a pair of intersecting beams formed integrally therewith, the point of intersection of each pair of intersecting beams resting on one of said columns, the beams of each slab alining with a beam of an adjoining slab, each end of each beam being provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in each of said pockets and extending across said space, and a concrete filler for said pockets and space to unite said slabs integrally together.

7. A concrete structure comprising a pair of slabs, each of said slabs having a beam formed integrally therewith, said beams alining with each other, the adjoining ends of said beams being each provided with a pocket, the adjoining edges of said slabs being each provided with teeth, there being a space between the adjoining edges of said slabs, and a concrete filler for said space and pockets, said slabs constituting a unitary structure when the concrete filler in said space and pockets has become set.

8. A concrete structure comprising a pair of slabs, each of said slabs having a pair of beams formed integrally therewith, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said alining beams being each provided with a pocket, the adjoining edges of said slabs being each provided with teeth, there being a space between the adjoining edges of said slabs, and a concrete filler for said space and pockets, said slabs constituting a unitary structure when the concrete filler in said space and pockets has become set.

9. A concrete structure comprising a pair of slabs, each of said slabs having a pair of beams formed integrally therewith, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said beams being each provided with a pocket,

the adjoining edges of said slabs being each provided with teeth, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said space and pockets, said slabs constituting a unitary structure when the concrete in said space and pockets has become set.

10. A concrete structure comprising a pair of columns, a pair of slabs, each of said slabs having a pair of intersecting beams formed integrally therewith, the point of intersection of each pair of intersecting beams resting on one of said columns, a beam of one of said slabs alining with a beam of the other said slab, the adjoining ends of said alining beams being each provided with a pocket, the adjoining edges of said slabs being each provided with teeth, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said pockets and space to unite said slabs integrally together.

11. A concrete structure comprising a plurality of columns, a plurality of slabs, the adjoining edges of said slabs being each provided with teeth, each of said slabs having a pair of intersecting beams formed integrally therewith, the point of intersection of each pair of intersecting beams resting on one of said columns, the beams of each slab alining with a beam of an adjoining slab, the adjoining ends of said beams being each provided with a pocket, there being a space between the adjoining edges of said slabs, reinforcing bars located in said pockets and extending across said space, and a concrete filler for said space and pockets to unite said slabs integrally together.

12. A concrete structure including a slab formed with a pair of beams which extend at right angles to and intersect each other, said beams extending central of the length of the sides and ends of the slabs, a column on which the slab seats, the point of seating being at the point of intersection of the beams, and a second column arranged over the first and seating on top of the slab.

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

ALBERT J. MEIER.

Witnesses:
GLADYS WALTON,
GEORGE G. ANDERSON