J. E. CONZELMAN

CONCRETE CONSTRUCTION.

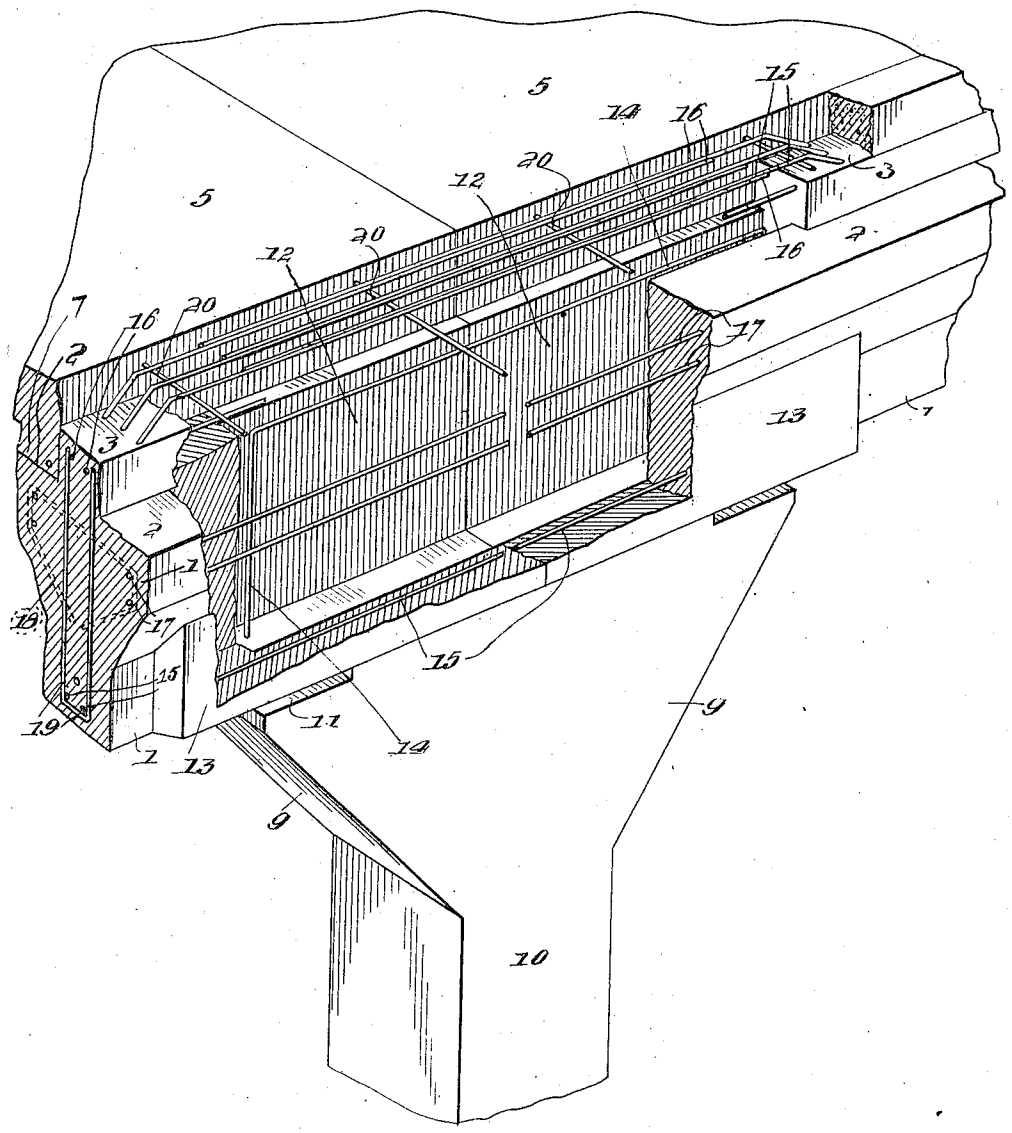
APPLICATION FILED JUNE 5, 1911.

1,031,046.

Patented July 2, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Lottie M. Fox.
Bertha von Behrens.

Inventor:
John E. Conzelman,
By Hugh K. Wagner,
His Attorney.

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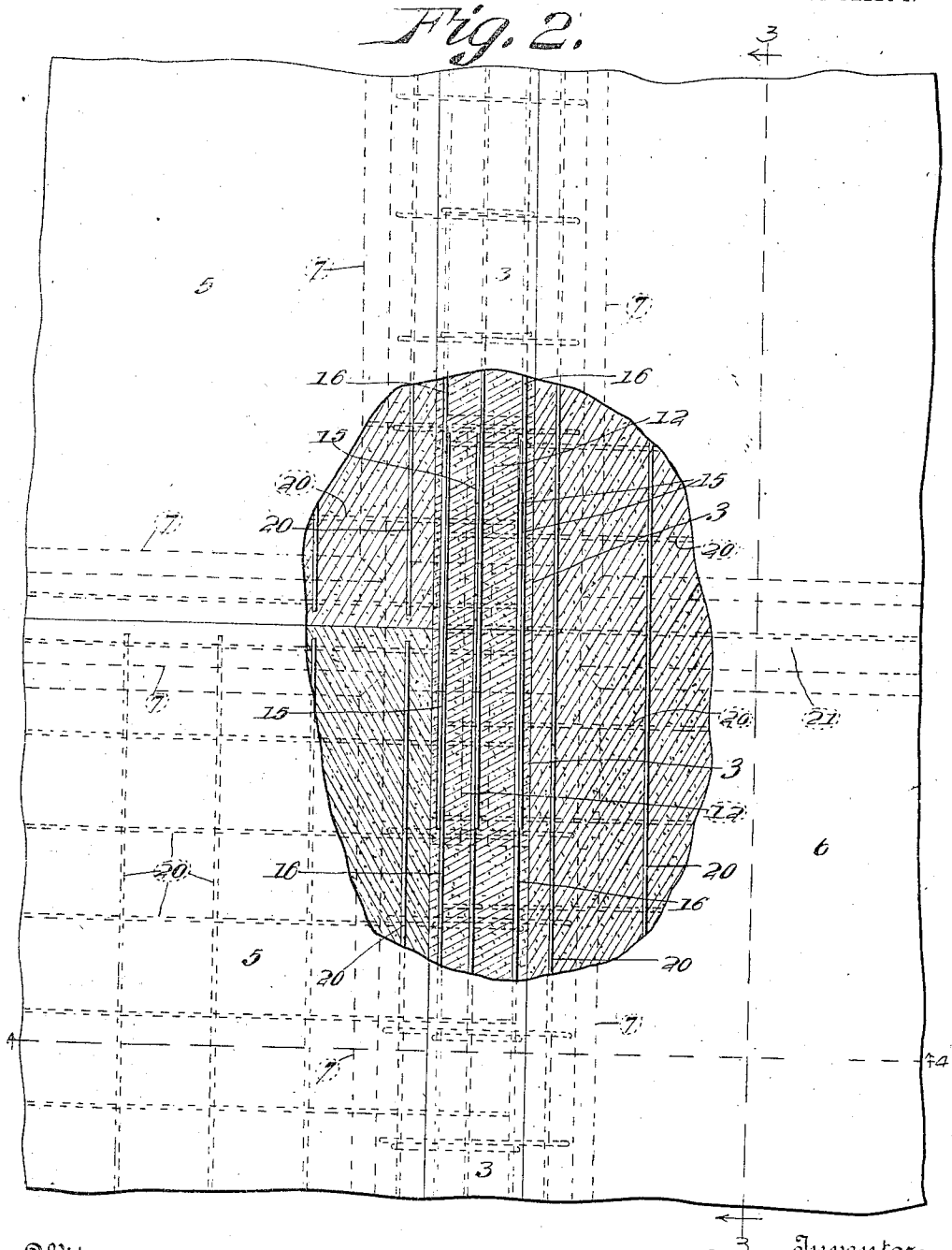
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

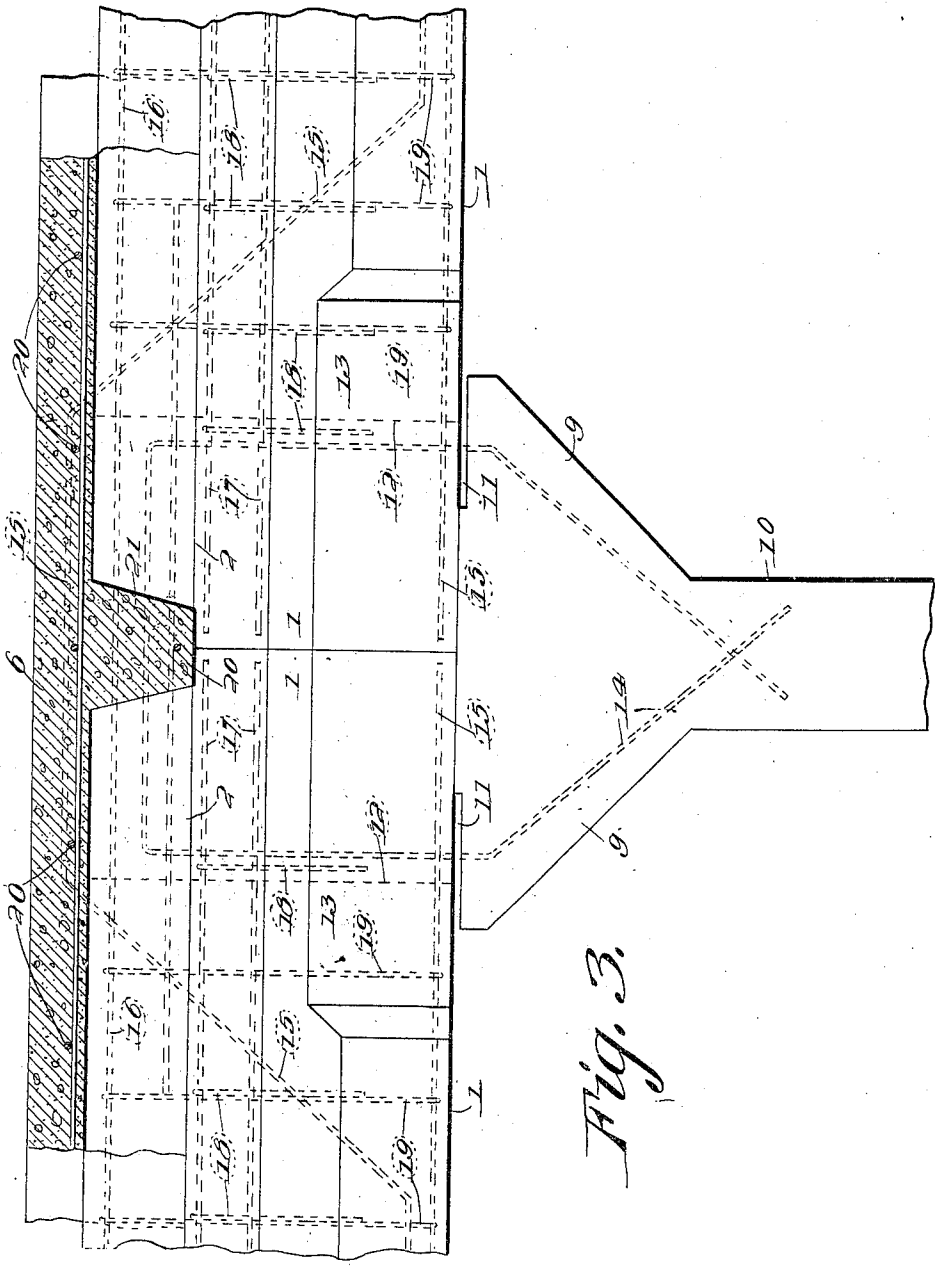

Fig. 3.

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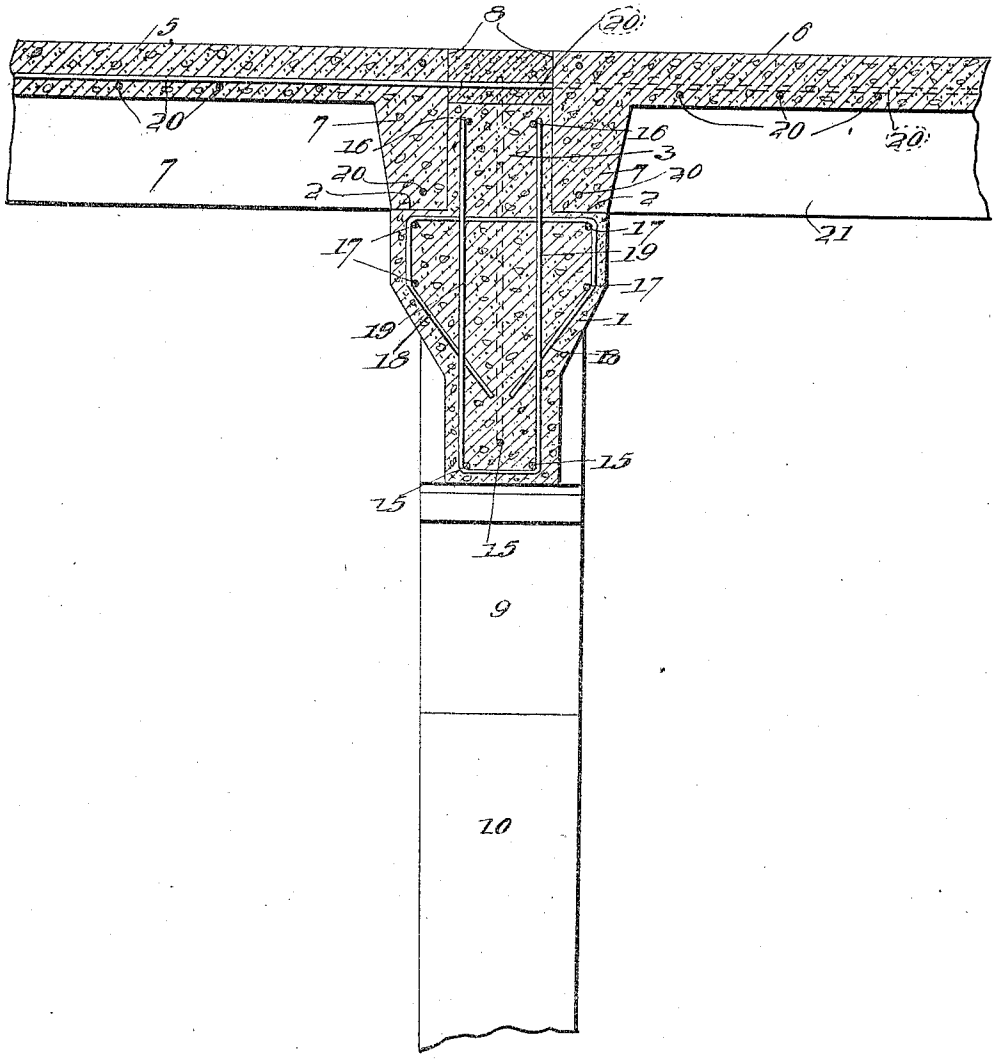
4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN E. CONZELMAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO UNIT CONSTRUCTION COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF DELAWARE.

CONCRETE CONSTRUCTION.

1,031,046. Specification of Letters Patent. Patented July 2, 1912.

Original application filed November 16, 1909, Serial No. 528,298. Divided and this application filed June 5, 1911. Serial No. 631,276.

To all whom it may concern:

Be it known that I, JOHN E. CONZELMAN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Concrete Construction, (Divisional Case M,) of which the following is a specification.

This application is a division and continuation of my Patent No. 992733 granted May 16, 1911, application filed by me Nov. 16, 1909, Serial No. 528,298.

This invention relates to certain new and useful improvements in concrete construction, and pertains particularly to a construction in which concrete slabs and beams are used for ceilings and floors.

It is the object of this invention to provide a structure of concrete building elements which coöperate and are interengaged to form a unitary and rigid structure, and further to provide a structure in which the beams support the slabs in a novel manner to be hereinafter more fully described.

In the drawings: Figure 1 is a view in perspective, some of the parts being broken away and shown in section, Fig. 2 is a top plan view, illustrating parts broken away and in section, Fig. 3 is a section on the line 3—3 of Fig. 2 and Fig. 4 is a section on the line 4—4 of Fig. 2.

It is to be understood that the slabs and beams hereinafter referred to may be made at any desired place, but preferably away from the location where the building in which they are used is being constructed.

Each beam 1 is provided with shoulders 2 and a tenon 3, the latter being preferably shorter than the length of beam 1 and terminates within a short distance of each end of the beam.

In the present invention there is employed a pair of small slabs 5 and a large slab 6 of a length approximately equal to that of the combined lengths of both slabs 5, the latter seating on the shoulders 2 on one side of the beams and the large or long slab 6 seating on the shoulders 2 on the opposite sides of said beams. The slabs are preferably molded or formed with depending flanges 7 on their under faces which latter seat on the shoulders 2, and act to obviously strengthen the slabs. The flanges 7 raise the top faces of the slabs so that the same are located above the tops of the tenons 3, so that, when a slab is placed upon each shoulder 2 of a beam, a space 8 is left above tenon 3 and between the two slabs supported by said beam. Grout or wet concrete is poured into space 8, and is leveled off flush with the top faces of the slabs, which grout or wet concrete becomes set in said space between the slabs and the beams and thereby unites said parts and constitutes a monolithic structure. The flanges 7 may be omitted, and the slabs 5 and 6 formed of such thickness that the top faces thereof will be raised to a higher elevation than the top of tenon 3, when the slab edges are placed on shoulders 2, in a manner above described.

A gusset 9, or a plurality of such gussets are formed on column 10, the gussets being provided with cutaway portions 11 on their upper ends which communicate with a slot 12 formed in the inner end of each beam 1. The inner ends of the beams abut as seen in Fig. 2, and the slots 12 register with each other. Further the slots 12 communicate with space 8, so that, when grout or wet concrete is poured into space 8, it enters and fills each slot 12 and each cutaway portion 11, which latter communicate with said slots 12.

An enlarged portion 13 is formed on the lower part of the end of each beam 1, and is preferably of such thickness that each side of the enlarged portion is in alinement with the adjacent side of the adjacent gusset 9 upon which the end of the said beam rests. Should the beam 1 sag after it is placed in position on a column 10, the cutaway portion 11 prevents contact of the beam with the gusset, whereby the load is imparted directly to the column.

A reinforcing bar 14 is embedded in the top of column 10 and is provided with a bent or looped portion which projects above the column and into the registering slots 12. Reinforcing bars 15 are embedded in the lower part of each beam 1, and, adjacent the end thereof, one or more of the bars turn upwardly and project from tenon

3 and extend preferably above the bar 14. Reinforcing bars 16 are embedded in the upper parts of tenons 3, and protrude from the tenon ends, being located preferably above reinforcing bar 14. The bars 15 and 16 are preferably of sufficient length to overlap the similar bars 15 and 16 projecting from the tenon of a beam extending in the same direction, as shown in Figs. 1 and 2.

The shoulders 2 are provided with reinforcing bars 17 which are encircled at intervals by bars 18. U-shaped reinforcing bars 19 are spaced at intervals in the beams 1, and the lower part of each bar 19 preferably underlies bars 15. The ends of each bar 19 extend within a short distance of the top of tenon 3, as depicted in Figs. 1, 3, and 4, or said ends can project above the tenons 3 into space 8. Reinforcing bars 20 are embedded in each of the slabs 5 and 6, and those rods which extend at an angle to space 8 preferably project into said space. In Fig. 2, the dotted lines indicating reinforcing bars 20 have been shown complete in but one slab 5, though it will be understood that the bars 20 of the other slabs are, in practice, similarly provided.

The slabs 6 are reinforced with a central beam 21 formed on its under face and extending transverse to the beams 1 and alining with the center of the column.

In forming a structure according to the present invention, the column 10 is erected, and the beams placed thereon in abutting relation so that their slots 12 register and bar 14 projects into said registering slots 12. The slabs 5, 5, and 6 are then positioned on the shoulders 2 of the two beams so that their flanges 4 abut tenons 3. The outer ends of the beams are supported by uprights or any other suitable means of support, not shown. The sides of the cutaway portions 11 are then covered with so called forms, not shown, whereupon grout or wet concrete is poured into slots 12 and the spaces 8. When the grout or wet concrete has become set, a unitary structure comprising the above mentioned elements is obtained, and the juncture of the elements is greatly strengthened by virtue of the reinforcing bars.

What is claimed is:

1. In concrete construction, a column, a pair of beams seating on the column and having their ends in abutting engagement, each of said beams being formed with a tenon and shoulders on opposite sides of the tenon, a pair of slabs on one side of the beams seating on said shoulders thereof, a third slab of approximately double the length of said pair of slabs seating on the opposite shoulders of the beams, and a reinforcing beam formed on the under face of said third slab and located in alinement with the center of the column and resting on the adjacent shoulders of said pair of beams.

2. In concrete construction, a column, a pair of beams seating on the column, each beam having a tenon and shoulders on their opposite sides located below the top face of the tenon, a pair of slabs seating on the shoulders on one side of the beams having their top faces extending above said tenons, a third slab of approximately the length of the combined lengths of the pair of slabs seating on the shoulders on the opposite sides of the beams and having its top face extending above said tenons, transverse reinforcing rods carried by each slab and extending over the top face of said tenons of the beams, and a concrete filler seating on the tenons, engaging the sides of the slabs which project above said tenons and inclosing said reinforcing rods.

3. In concrete construction, a column, a pair of beams seating thereon, each of said beams being formed with shoulders on their opposite sides, a pair of slabs seating on one side of the beams on said shoulders of the latter, a third slab disposed at right angles to said pair of slabs and seating on the other side of the beams on said shoulders of the latter, said slabs projecting above the top faces of said shoulders, and a concrete filler engaged between the sides of the slabs and the projecting portions of the beams, said third slab extending across the joint between the pair of slabs.

4. In concrete construction, a column, a pair of beams having their inner ends abutting and formed with registering slots which overlie the column, said beams each having a tenon and shoulders on opposite sides thereof located below the tenon, a pair of slabs seating on the shoulders on one side of the beams and having their upper faces extending above the top faces of the tenons, a long slab seating on the shoulders on the other sides of the beams and having its top face extending above the top faces of the tenons, and concrete filling said slots of the beams seating on the top faces of the tenons and engaging between the side faces of the slabs which project above said tenons.

5. In concrete construction, a column, a pair of beams having their inner ends abutting and formed with registering slots which overlie the column, said beams each having a tenon and shoulders on opposite sides thereof located below the tenon, a pair of slabs seating on the shoulders on one side of the beams and having their upper faces extending above the top faces of the tenons, a long slab seating on the shoulders on the other sides of the beams and having its top face extending above the top faces of the

tenons, reinforcing rods carried by the tenons and arranged in overlapping engagement over the column, reinforcing rods carried by the slabs and extending over the top faces of the tenons, and concrete filling said slots of the beams seating on the top faces of the tenons and engaging between the side faces of the slabs which project above said tenons and inclosing all of said reinforcing rods.

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

JOHN E. CONZELMAN.

Witnesses:

ARCHER M. RICHARDS,

D. P. LANE.