

J. E. CONZELMAN.
CONCRETE RESERVOIR.
APPLICATION FILED NOV. 9, 1911.

1,031,050.

Patented July 2, 1912.

5 SHEETS—SHEET 1.

Fig. 1.

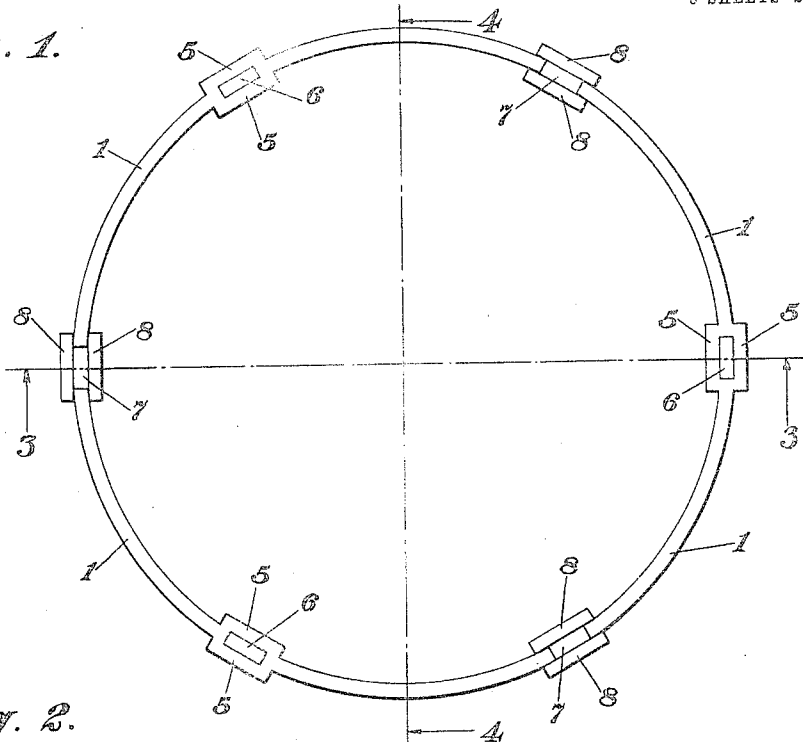
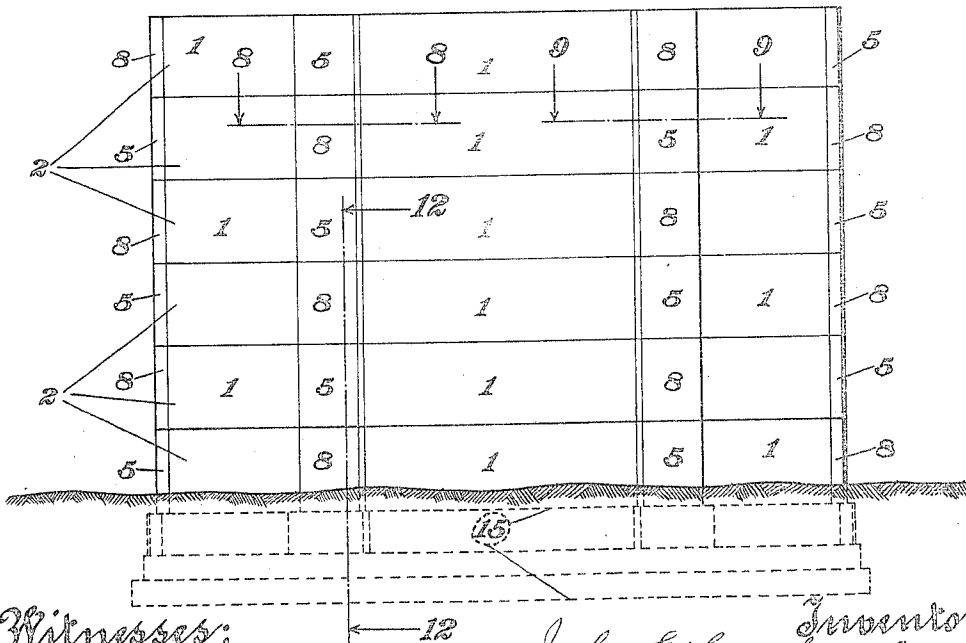


Fig. 2.



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By Hugh N. Wagner,
His Attorney.

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5 SHEETS—SHEET 2.

Fig. 3.

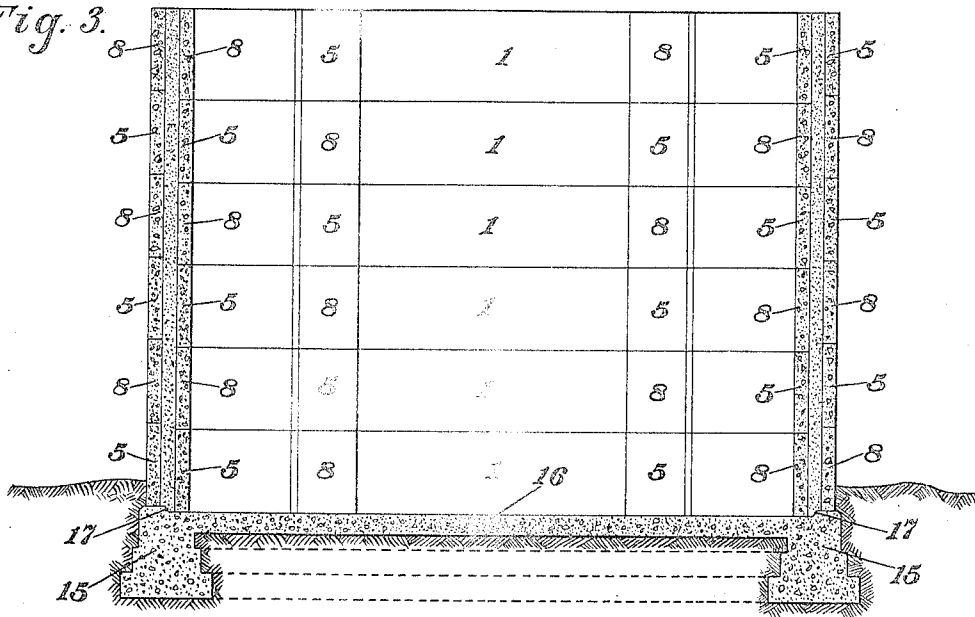
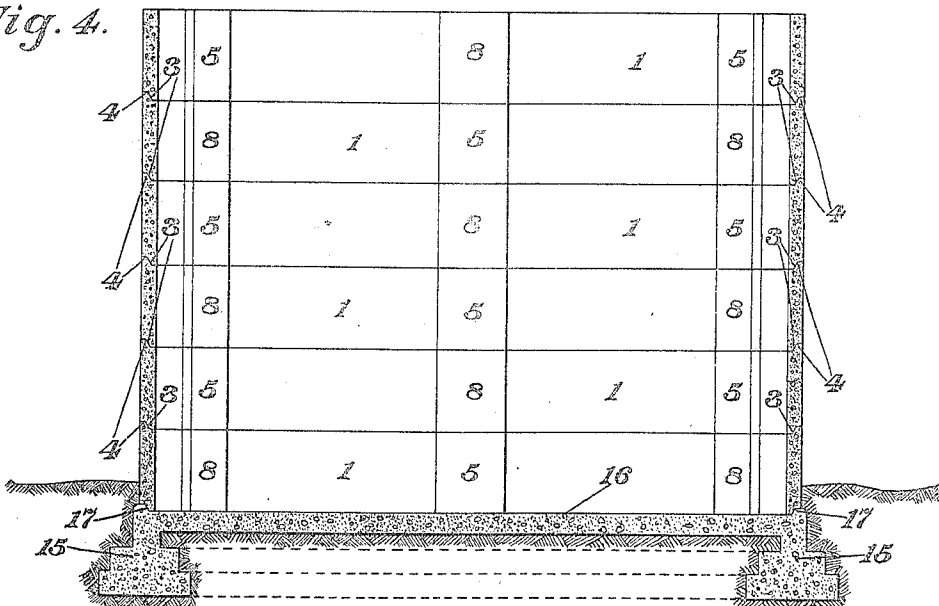


Fig. 4.



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5 SHEETS—SHEET 3.

Fig. 5.

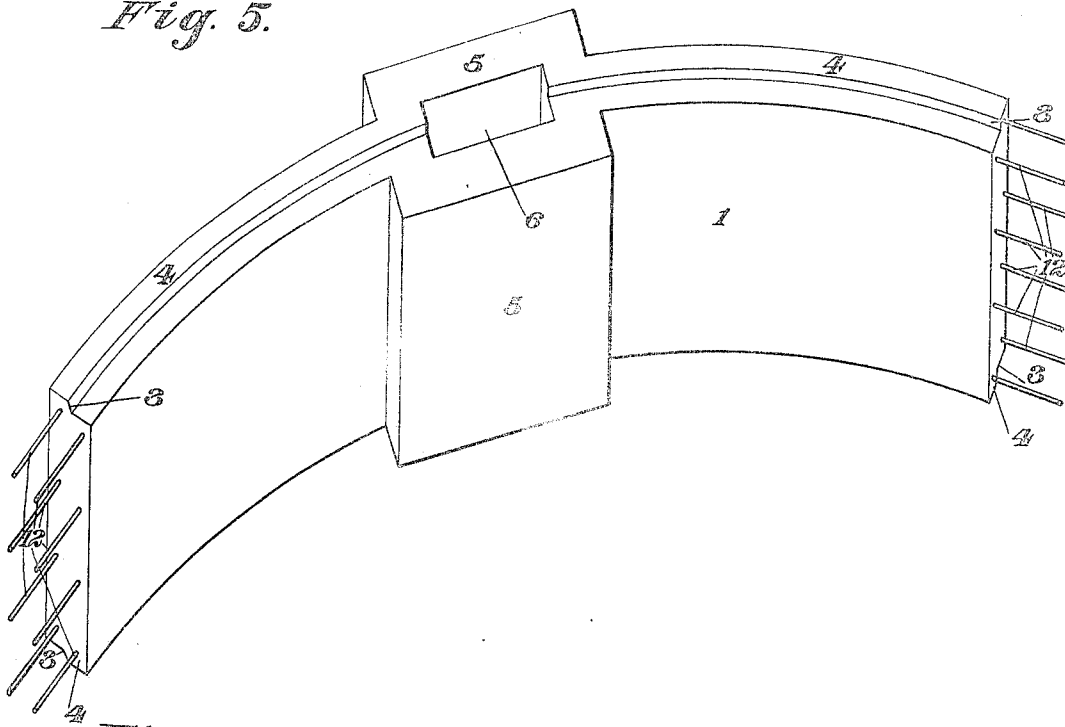


Fig. 6.

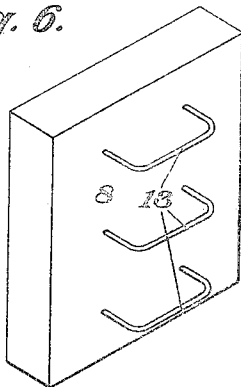
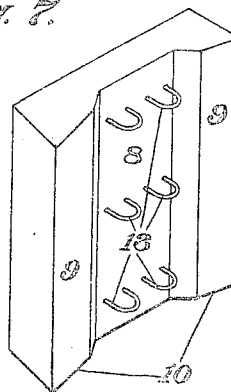


Fig. 7.



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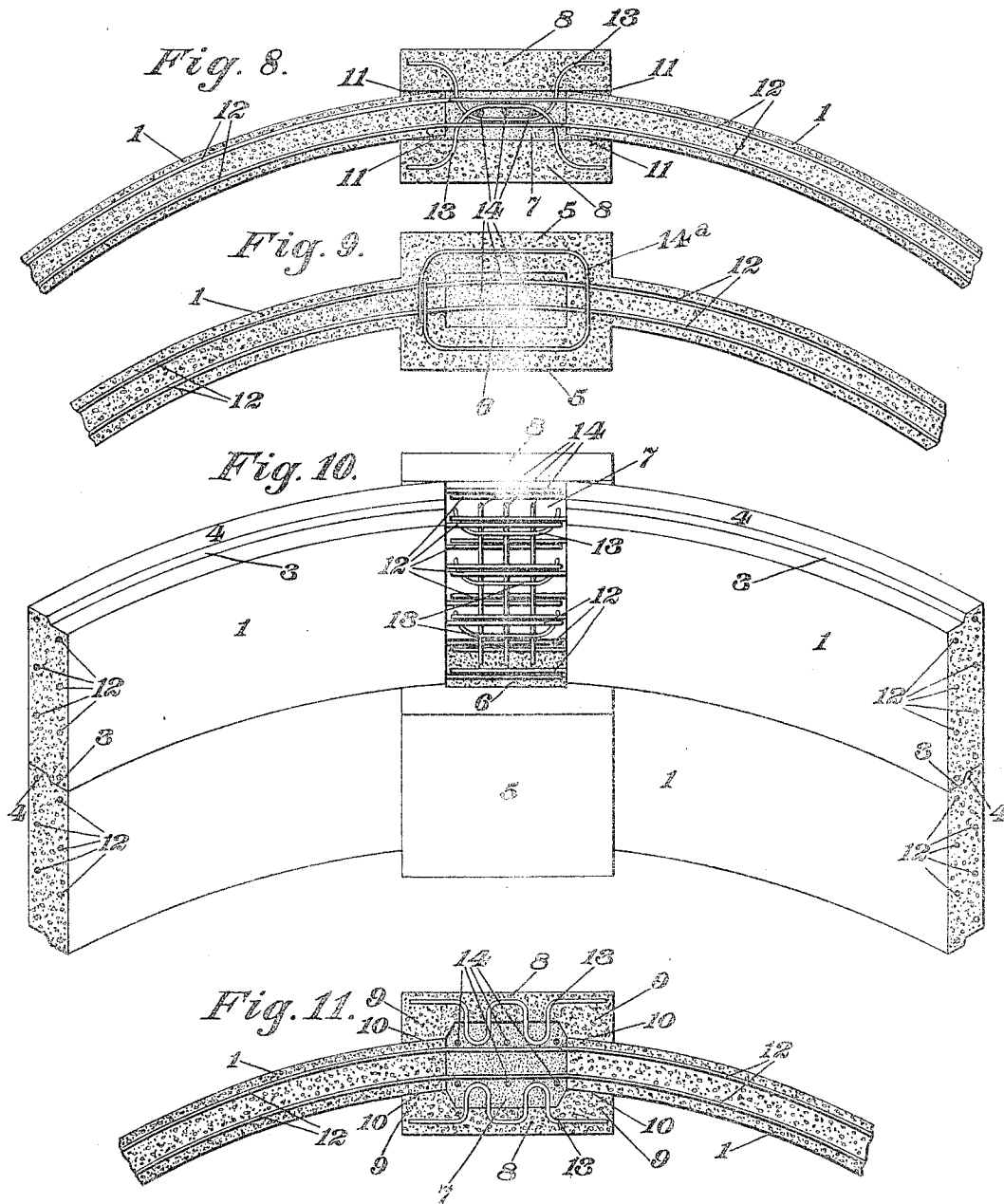
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5 SHEETS--SHEET 4.



Witnesses:
Lottie M. Fox
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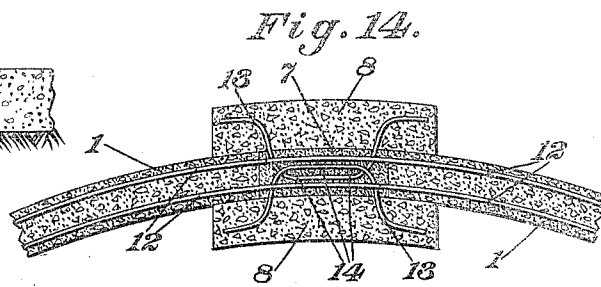
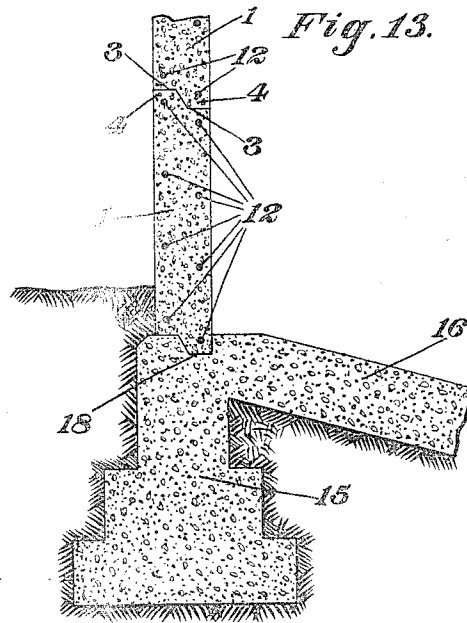
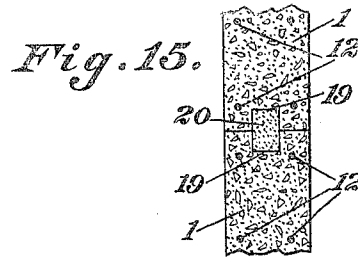
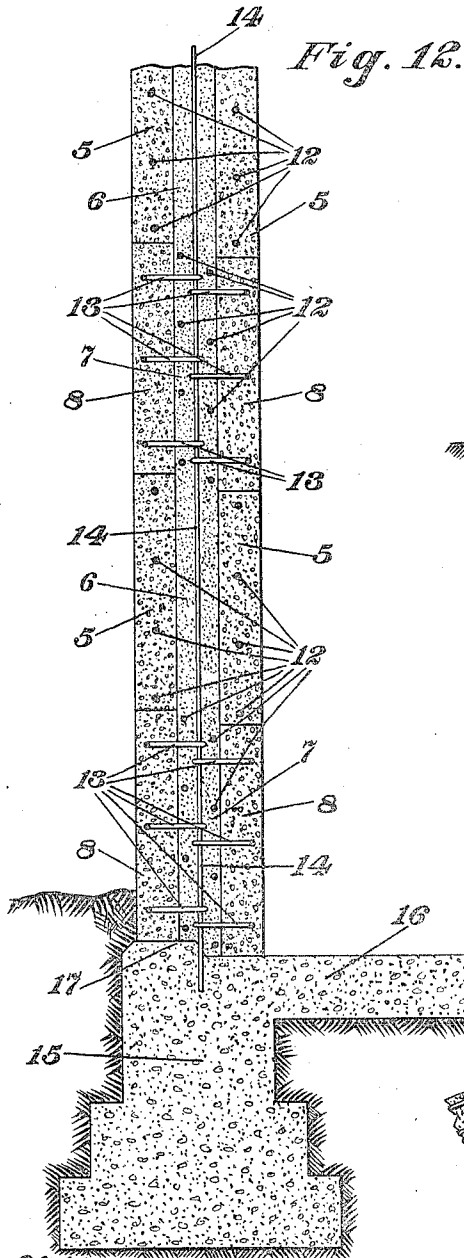
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5 SHEETS—SHEET 5.



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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 RESERVOIR.

1,031,050.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed November 9, 1911. Serial No. 659,297.

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 Reservoirs, of which the following is a specification.

This invention relates to concrete building structures and has particular reference to a construction in which concrete slabs are used for the walls of a reservoir, tank, cistern, and the like.

It is an object of this invention to provide a structure of concrete building elements, which cooperate and are interengaged to form rigid, secure, and lasting junctures of said elements.

It is, also, an object to provide a concrete building structure in which the general construction of the cooperating elements is generally improved to present a neat appearance as well as to prove of strong and durable nature.

Further, this invention consists of the novel features of construction and arrangement of parts, as hereinafter more fully described and pointed out in the claims.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a plan view of a concrete reservoir embodying this invention; Fig. 2 is a side elevation of same; 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 perspective view, on an enlarged scale, of one of the slabs; Fig. 6 is a perspective view, on an enlarged scale, of one of the concrete blocks; Fig. 7 is a perspective view, on an enlarged scale, of an alternate form of concrete block; Fig. 8 is a sectional view, on an enlarged scale, on the line 8—8, Fig. 2; Fig. 9 is a sectional view, on an enlarged scale, on the line 9—9, Fig. 2; Fig. 10 is a fragmentary perspective view, on an enlarged scale, showing the junction of three slabs, one of the concrete blocks being removed. Fig. 11 is a horizontal sectional view showing the junction of two slabs with the alternate form of concrete block; Fig. 12 is a sectional view, on an enlarged scale, on the line 12—12, Fig. 2, showing the reinforcement; Fig. 13 is a vertical sectional

view showing an alternate form of junction between the bottom slab and the foundation; Fig. 14 is a horizontal sectional view showing the junction of two slabs with an alternate form of concrete block; and Fig. 15 is a vertical section showing an alternate form of the invention.

The reservoir is preferably formed with a cylindrical configuration, and consists of a plurality of arcuated slabs 1 that are arranged in annular rows 2, as hereinafter described, said rows being supported one on top of another. Each slab 1 is provided with a rabbet 3 and rib 4 that extend longitudinally of its upper edge and, also, with a rabbet 3 and rib 4 that extend longitudinally of its lower edge. A surface-rib 5 is provided on each face of said slab 1 and is arranged to extend substantially vertically at the middle of said slab. The surface-rib 5 on the inner face of slab 1 is preferably located directly opposite the surface-rib 5 on the outer face of same, and both of said surface-ribs form opposite walls of an opening 6 that extends substantially vertically through said slab, said opening being preferably formed with a rectangular cross-sectional configuration. Each row 2 has its slabs 1 arranged in arcual alinement and spaced apart so as to leave a space 7 between the ends of each two adjacent slabs, said space being approximately as long as the opening 6. The sides of the space 7 are closed by a pair of concrete blocks 8, and said space is then filled with grout, or similar cement mixture, or wet concrete, which, when set, unites said blocks and the ends of slabs 1 adjacent said space integrally. Each block 8 is preferably molded with a rectangular configuration and, also, with substantially the same width as surface-rib 5, and, when said slab is placed in position to close a side of space 7, same overlaps the ends of the slabs 1 adjacent thereto. Said block 8 may be flat, as depicted in Figs. 6 and 8, or same may be molded with the same curvature as slab 1, as illustrated in Fig. 14, or, if desired, same may bear a pair of flanges 9 that extends vertically on one face of said block, said flanges being located adjacent the sides of said block and having curved or beveled faces 10, as shown in Figs. 7 and 11. When a flat block 8 is used to close a side of the space 7, cracks 11 are left between the

face of said block and the faces of each slab 1 adjacent thereto, and same are filled with grout, which sets integrally with said block and said slabs. When an arcuated block 8 is used, same fits snugly against the faces of each slab 1 adjacent thereto, and when a slab 8 having flanges or ribs 9 is used, the curved or beveled faces of said flanges or ribs fit snugly against the faces of each slab 1 without intervening cracks 11. Each block 8 is preferably formed with such height that the top surface thereof registers in substantially the same plane with the upper edge of the slab 1 adjacent thereto. Reinforcing bars 12 extend into space 7 from slabs 1 and other bars 13 extend into said space from blocks 8. The bars 12 extend longitudinally through slab 1 and, also, through the opening 6 in said slab 1, and the reinforcing bars 12 that enter said space from one end thereof may overlap bars 12, which enter said space from the opposite end thereof. The reinforcing bars 13 are preferably U-shaped and those that enter said space from one side thereof may overlap others that enter said space from the opposite side thereof, so as to allow a bar or bars 14 extending vertically in said space to pass through all of said U-shaped bars, as shown in Fig. 8. If desired, the bars 13 may have a plurality of U-shaped parts that project into said space, said U-shaped parts being preferably arranged so same enter said space without overlapping, as illustrated in Fig. 11, the bars 14 being located adjacent said U-shaped parts without passing therethrough. Bars 14^a are embedded in the surface-ribs 5 and are bent, so as to encircle the opening 6 between said surface-ribs.

The slabs 1 that constitute the lower annular row 2 are preferably supported on a monolithic foundation wall 15 having a concrete floor 16 formed integrally therewith and are arranged in arcual alinement, said wall 15 being provided either with an annular rib 17 that fits in the rabbets 3 in the lower edges of each slab 1 in the lower row 2, as best seen in Fig. 4, or with an annular groove 18, in order to allow the ribs 4 on the lower edges of each slab 1 in the lower row 2 to fit therein, as depicted in Fig. 13. Just previous to the placing of the slabs 1 in the lower row 2 in place on the foundation wall 15, the lower edges of each of said slabs are "battered" with grout, which, when set, unites said slabs and said foundation wall integrally, thus constituting a monolithic structure. The slabs 1 that constitute the second row 2 are placed in position on the lower row 2, so that the ribs 4 on the lower edges of each slab 1 in the second row and the ribs 4 on the upper edges of each slab 1 in the lower row fit in the rabbets 3 in the upper edges of each slab 1 in the lower

row and the rabbets 3 in the lower edges of each slab 1 in the second row, respectively, the adjoining edges of said rows being "battered" with grout, which, when set, unites said rows integrally. Said slabs 1 in the second row 2 are arranged so that the openings 6 therein register in vertical alinement with the spaces 7 between the blocks 8 and the ends of the slabs 1 in the lower row 2, and the spaces 7 between the blocks 8 and the ends of the slabs 1 in the second row register in vertical alinement with the openings 6 in the slabs 1 in the lower row 2, with the result that the surface-ribs 5 and blocks 8 in the second row register in vertical alinement with the blocks 8 and surface-ribs 5 in the lower row, respectively. The third row 2 is similarly placed in position on the second row 2 and, so on, until the reservoir is completed, so that the surface-ribs 5, blocks 8, openings 6, and spaces 7 in each row register in vertical alinement with blocks 8, surface-ribs 5, spaces 7, and openings 6, respectively, in the row adjacent thereto, the adjoining edges of each two adjacent rows being "battered" with grout and all of the openings 6, spaces 7, and cracks 11 being filled with grout, so that, when the grout sets, the rows 2 and slabs 1 and blocks 8 are integrally united thereby, thus constituting a monolithic structure. The rabbets 3 and ribs 4 are preferably omitted entirely from the upper edges of each slab 1 in the top row 2 of the reservoir and the upper surfaces of each block 8 in the top row are flush with the upper edges of said slabs. The bars 14 extend substantially the entire height of the reservoir, and may have their lower ends embedded in the foundation wall 15, as depicted in Fig. 12. If desired, a cover (not shown in the drawings) may be placed on top of the reservoir.

By reason of the slabs 1 being joined by means of rabbeted junctures, the monolithic concrete structure herein described is rendered suitable for use as a reservoir tank, cistern, or other receptacle for holding any kind of fluid or the like.

In the alternate form depicted in Fig. 15, the rabbets 3 and ribs 4 are omitted entirely from the top and bottom of each slab 1, and grooves 19 are substituted in lieu thereof, so that, when one slab is placed on top of another, the grooves 19 in the adjoining edges of said slabs register with each other. Said grooves are filled with grout or concrete which, when set, forms a concrete key 20 that integrally unites said slabs and prevents lateral movement of same.

I claim:

1. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, each of said slabs having an opening extending vertically therethrough, the slabs

of each row being arranged to have intervening spaces between the ends thereof, the slabs of each alternate row being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces, and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

2. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, each of said slabs having an opening extending vertically therethrough, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of each alternate row being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces, surface-ribs borne by said slabs and registering in vertical alinement with said blocks, and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

3. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, each of said slabs having an opening extending vertically therethrough and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, reinforcing bars projecting from said slabs into said spaces, and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

4. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, each of said slabs having an opening extending vertically therethrough and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, reinforcing bars projecting from said slabs into said spaces, reinforcing bars projecting from said blocks into said spaces, and a concrete filler for said spaces and said openings

adapted to set integrally with said blocks and said slabs.

5. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, each of said slabs having an opening extending vertically therethrough and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, reinforcing bars projecting from said slabs into said spaces, reinforcing bars projecting from said blocks into said spaces, reinforcing bars extending vertically through said spaces and said openings, and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

6. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, a foundation supporting the lower row of slabs and having a rabbeted connection therewith, each of said slabs having an opening extending vertically therethrough and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

7. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, a foundation supporting the lower row of slabs having a rabbeted connection therewith, each of said slabs having an opening extending vertically therethrough and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, reinforcing bars extending vertically through said spaces and said openings and having their lower ends embedded in said foundation,

and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

8. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, a foundation supporting the lower row of slabs and having a rabbeted connection therewith, each of said slabs having an opening extending vertically therethrough and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, reinforcing bars extending vertically through said spaces and said openings and having their lower ends embedded in said foundation, reinforcing bars projecting from said slabs into said spaces, reinforcing bars projecting from said blocks into said spaces, and a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs.

9. A concrete reservoir comprising a plurality of annular rows of arcuated slabs, said rows being supported one on top of another, a foundation supporting the lower row of slabs and having a rabbeted connection therewith, each of said slabs having an opening extending vertically therethrough

and surface-ribs extending vertically adjacent the sides of said opening, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of the alternate rows being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, blocks closing the sides of said spaces and registering in vertical alinement with said surface-ribs, a concrete filler for said spaces and said openings adapted to set integrally with said blocks and said slabs, and a cementing substance integrally uniting said rows and, also, integrally uniting the lower row with said foundation.

10. A concrete reservoir including a plurality of rows of slabs arranged in superimposed order, each slab having a vertical opening therethrough, the slabs of each row being arranged to have intervening spaces between the ends thereof, the slabs of each alternate row being arranged so that the openings therein register in vertical alinement with the spaces between the ends of the slabs of the other rows, means for closing the sides of the spaces between the ends of adjacent slabs, and a concrete filler for said spaces and said openings.

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

JOHN E. CONZELMAN.

Witnesses:

D. P. LANE,
ARCHER W. RICHARDS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."