

C. A. P. TURNER.  
 REINFORCED CONCRETE CONSTRUCTION.  
 APPLICATION FILED APR. 17, 1912.

1,072,532.

Patented Sept. 9, 1913.

FIG. 1.

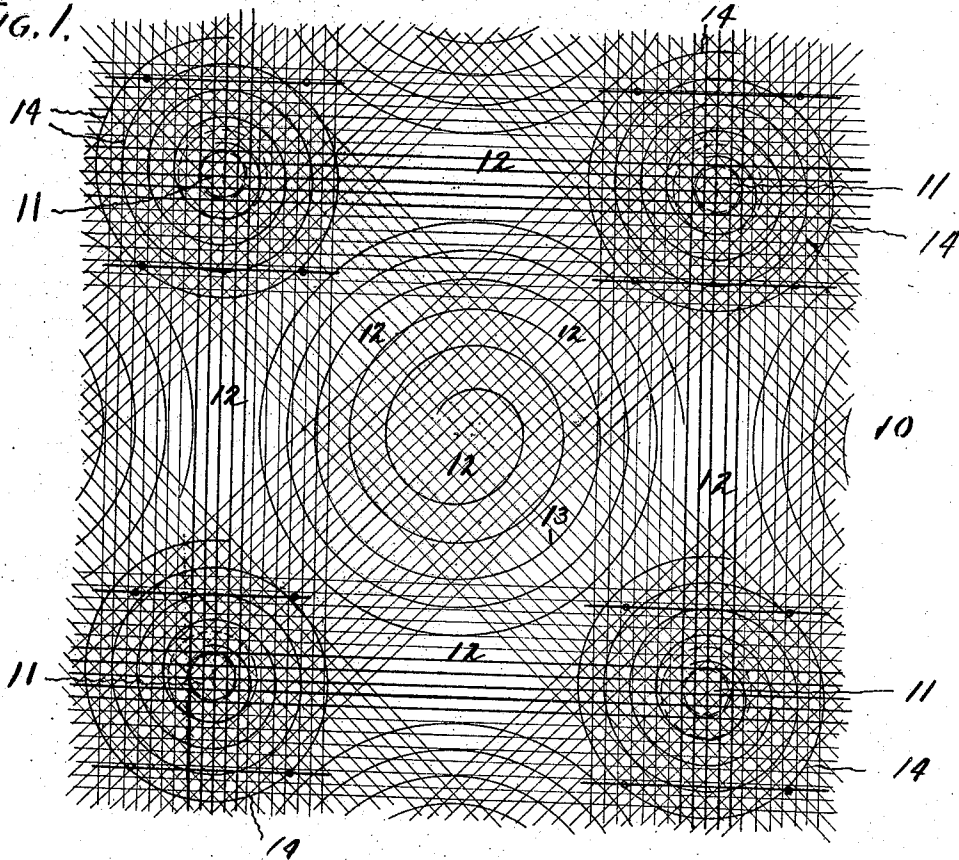


FIG. 2.

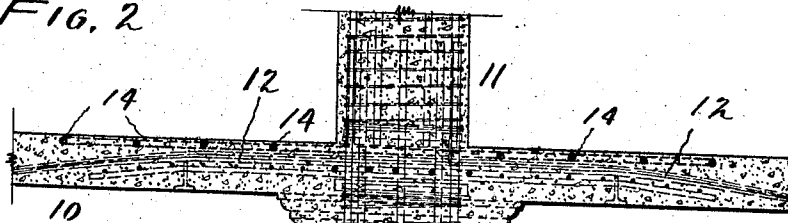
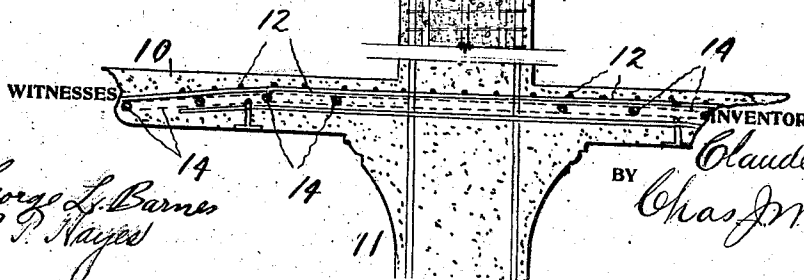


FIG. 3.



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# UNITED STATES PATENT OFFICE.

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REINFORCED CONCRETE CONSTRUCTION.

1,072,532.

Specification of Letters Patent.

Patented Sept. 9, 1913.

Continuation of application Serial No. 603,562, filed January 19, 1911. This application filed April 17, 1912. Serial No. 691,273.

To all whom it may concern:

Be it known that I, CLAUDE A. P. TURNER, of Minneapolis, in the county of Hennepin, and in the State of Minnesota, have invented a certain new and useful Improvement in Reinforced Concrete Construction, and do hereby declare that the following is a full, clear, and exact description thereof.

This application is a continuation of my application No. 603,562, filed January 19, 1911, and is addressed particularly to the subject-matter disclosed, but not claimed in the said application, which has to do with the form of reinforcement in the slab over the columns or piers, when the slab is supported by means of columns or piers, the object of my invention, in that behalf, being to provide an efficient arrangement of reinforcement which will take care of the peculiar radial and circumferential stresses which develop under a load that tends to bend a circular section of the floor concentric with the support downward and which results in stretching or straining the fibers in the upper tension zone both radially and circumferentially.

In the accompanying drawings—Figure 1 is a top plan view of a column-supported floor slab embodying one form of my invention; Fig. 2 is a vertical section on a larger scale through a portion of the slab and portions of contiguous columns; and Fig. 3 is a similar view showing a different location of the spiral cantaliver head.

In the form of my invention shown in the drawings, the flat floor slab 10 of reinforced concrete is supported by reinforced concrete columns 11, the slab reinforcement comprehending belts of rods 12 running directly from column to column in the shortest directions, and diagonally from column to column forming a four way reinforcement, and a circular, openwork framework 13 concentric with the slab center between supports. No claim is made herein to the arrangement of the slab reinforcement as that forms the subject of the parent application.

Concentric with each column in the tension zone of the slab above the column, is a wide-spreading cantaliver head in the form of a flat, or substantially flat spiral 14 that is concentric with the column and extends beyond the same into the slab, and said head

is crossed by the belts of slab rods. The head-forming spirals 14 may be either above the slab rods or below them.

The cantaliver-head forming spirals 14 differ substantially from a series of concentric rings, such as has heretofore been used, as will be evident from the following: In cases of unequal stresses on different sides of the column the spiral tends through its continuous form, with the coils reducing in diameter, to transfer this unequal stress toward the column center or support, whereas in the case of a series of mere concentric rings no action of this kind, except through the concrete or other reinforcement can occur, nor would the action of the spiral be exactly identical with the concentric ring even were the rings tied together with radial rods, because the action of the spiral would be to draw together or cause a certain amount of compression in the concrete due to the tension in the spiral as against merely causing some tension in a radial member, such as a radial rod. My flat spiral clearly differs from the axially elongated spiral which is used for column reinforcement, in that it acts in the tension zone alone of the slab over the support, while the spiral of the column or a spiral which increases in diameter around the capital acts on concrete which is essentially in compression and merely to hold the concrete in place or restrain it under compression, while the action of the flat coil is to throw compression into the concrete or offset to some extent tension actually existing therein due to the nature of the bending stress in the slab.

As shown in Fig. 2, the spiral 14 has all its coils in the same plane and it lies above the slab rods which intersect or cross each other at the columns, while as shown in Fig. 3 the spiral 14 dips down slightly toward its rim so that the coils do not all lie in the same horizontal plane and the belts of slab rods cross above the spiral 14.

Having thus described my invention what I claim is—

1. An arrangement of reinforcement for a column-supported flat plate floor of concrete, comprising floor slab reinforcement, slab-supporting columns, and cantaliver heads comprising each a spiral rod situated wholly between the planes of the top and

bottom of the slab above the column, and extending into the slab beyond the column, the slab reinforcement also extending above the column so that the slab at the column has embedded in it the spiral rod forming the cantaliver head and the slab reinforcement.

2. An arrangement of reinforcement for a column-supported flat plate floor of concrete, comprising floor slab reinforcement, slab-supporting columns, and cantaliver heads comprising each a spiral rod situated wholly between the planes of the top and bottom of the slab above the column, and extending into the slab beyond the column, the slab reinforcement consisting of belts of rods that extend from column to column and cross each other and cross said cantaliver heads where the said belts cross each other.

3. In reinforced concrete construction, the combination of a floor slab, a slab reinforcement therefor, slab supporting columns, and a supporting head for each of said columns that supports the slab reinforcement con-

sisting of a spiral rod whose coils are in substantially the same horizontal plane.

4. In reinforced concrete construction, the combination of a floor slab, a slab reinforcement therefor, slab supporting columns, and a column head consisting of a spiral whose coils are in substantially the same horizontal plane crossed by said slab reinforcement.

5. In reinforced concrete construction, the combination of a floor slab, slab supporting columns, a column head consisting of a spiral rod whose coils are in substantially the same horizontal plane, crossed by said slab reinforcement, the latter consisting of groups of rods running in multiple directions crosswise of the column heads.

In testimony that I claim the foregoing I have hereunto set my hand.

CLAUDE A. P. TURNER.

Witnesses:

CHAS. J. WILLIAMSON,  
JAMES H. MARR.

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