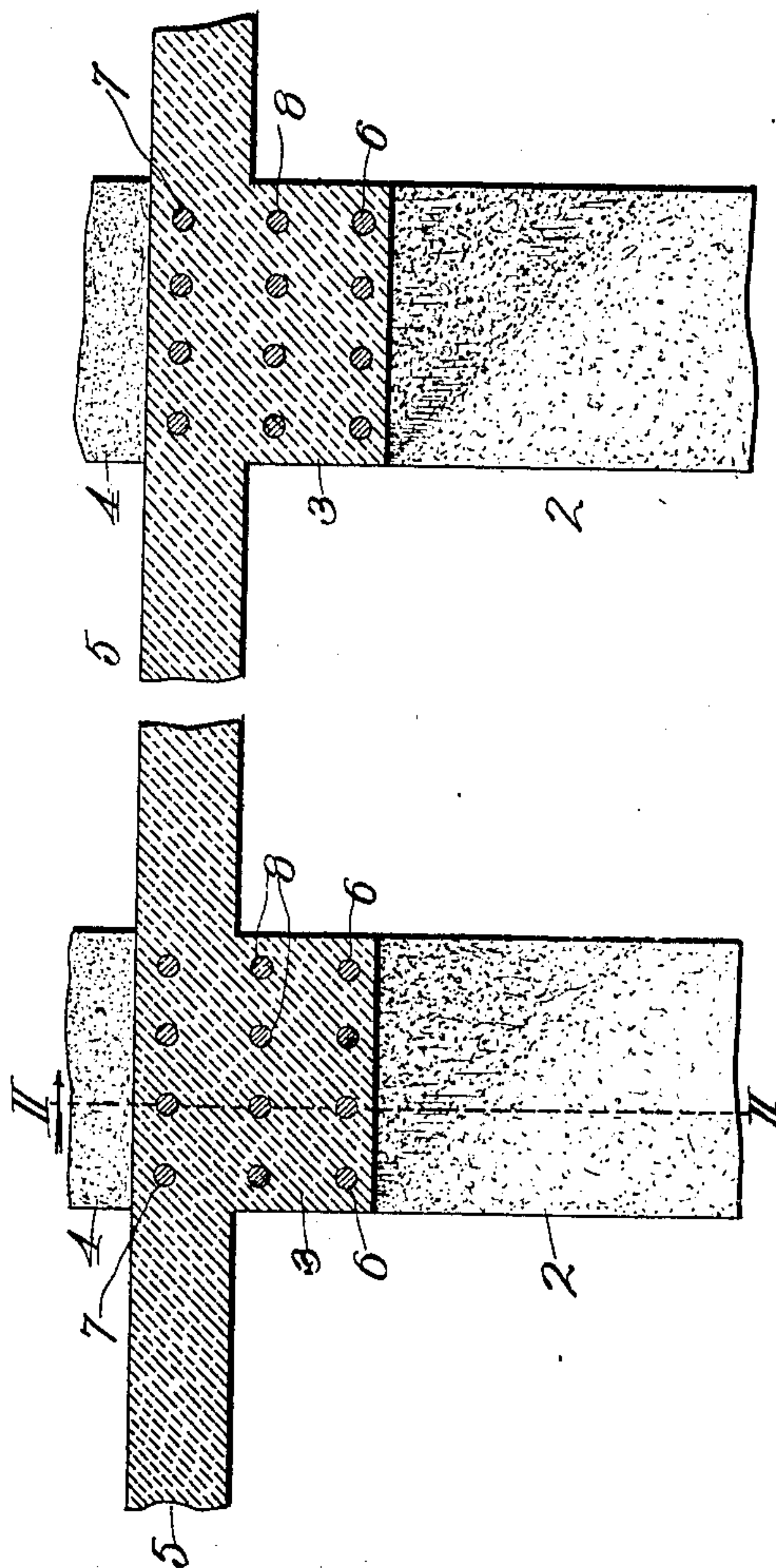
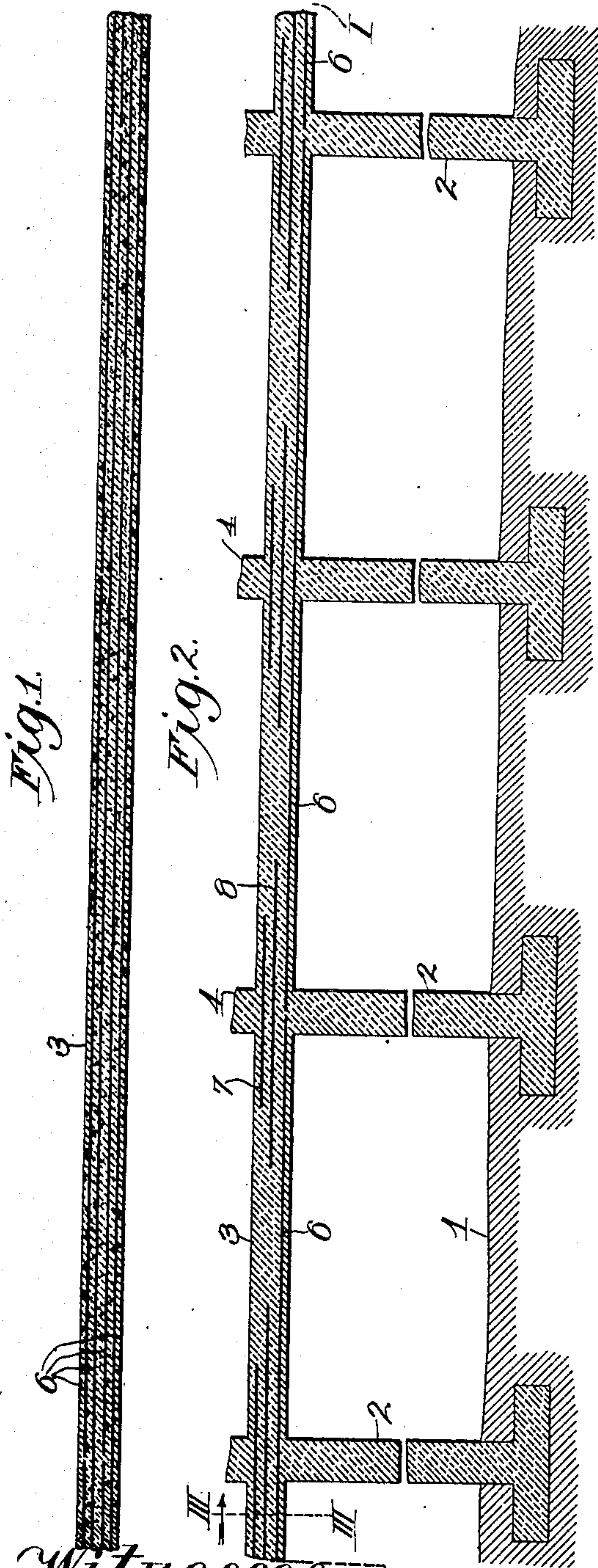


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 REINFORCED CONCRETE CONSTRUCTION.  
 APPLICATION FILED JUNE 1, 1908.

913,083.

Patented Feb. 23, 1909.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## REINFORCED CONCRETE CONSTRUCTION.

No. 913,083.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed June 1, 1908. Serial No. 436,083.

*To all whom it may concern:*

Be it known that I, ELBERT F. WILCOX, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Reinforced Concrete Construction, of which the following is a specification.

This invention relates to reinforced concrete construction and more especially to the construction of the concrete beams of buildings, my special object being to produce beams capable of sustaining the load imposed upon them and having the minimum tendency to shear.

A further object is to expeditiously and economically produce beams possessing the features of advantage mentioned.

To these ends the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which:—

Figure 1 is a horizontal section of a beam embodying my invention, on the line 1—1 of Fig. 2. Fig. 2, is a vertical longitudinal section taken on the line 11—11 of Fig. 3. Fig. 3, is an enlarged vertical transverse section on the line 111—111 of Fig. 2.

In the said drawing, 1 indicates a suitable foundation upon which is erected vertical columns 2, preferably of concrete.

3 indicates concrete beams extending parallel with each other and formed integral with or resting upon series of alined columns 2, the beams of one tier of columns forming the supports for the next tier of columns as indicated at 4. The parallel series of beams are connected by the usual concrete floor slabs 5, suitable false-work or form-work, not shown, being employed in the erection or production of the columns, beams and slabs, which false or form-work while constituting no part of my invention, is available afterward for the production of similar concrete structures or for other purposes. The beams, by preference, correspond in width to the columns and their depth is preferably less than their width, as I have found in practice that beams of such dimensions properly reinforced, as hereinafter explained, possess the requisite strength for building purposes and may be produced at less

expense for material and labor than the deeper and narrower beams commonly employed, as in the latter the shearing stress or the tendency of the upper and lower portions of the beam to separate is so great as to require special reinforcement.

I have found that the broad shallow beams have less tendency to shear and furthermore that in such beams the area of concrete opposed to the shearing action is increased and when such a beam is provided with suitable reinforcements, such as straight bars or rods, it is sufficiently strengthened at the shearing points to compel the beam if overloaded to break at its naturally weak point, that is midway between its columns or supports. As the tensile strain of the main reinforcing members in a shallow beam is obviously greater than in a deeper beam, more reinforcing bars or rods are required but this is offset where the wide shallow beam is employed, by the saving of labor in the placing of the reinforcements, and by avoiding the use of the specially manufactured and bent bars that are necessary to prevent shearing in deeper beams, and in the diminished amount of reinforcing needed for the concrete floor slab between the adjacent parallel beams, which slab obviously being narrower than if deep and narrow beams are employed, needs less reinforcement.

The reinforcing of the beams, as customary, must occur during their formation. For reinforcing purposes I employ by preference, straight reinforce bars or rods, which of course are the cheapest obtainable. For the principal reinforcement and strengthening of the beams I employ bars 6, of length to bridge the spaces between three columns and these bars are laid horizontally in or slightly above the plane of the undersides of the beams, it being noticed by reference to Fig. 1, where four of such reinforce bars appear, that two of the bars of the beam break joint with the other two in order to provide a continuous reinforcement of the beam from wall to wall of the building. To coöperate with said bars 6, I provide other reinforce bars 7, the same paralleling bars 6 and embedded in the beam near its upper surface, said bars passing over the top of the columns or supports and extending on either side of same to points beyond where the shearing tendency in the beam exists which is, as is well known, near the



support. To still further strengthen said beams, they may be provided with intermediate reinforce bars 8, arranged substantially parallel with and between bars 6 and 7 and by preference projecting beyond each side of the supporting column somewhat further than the bars 7.

From the foregoing, it will be apparent that a monolithic skeleton reinforced concrete structure is provided in which provision is made for all of the strains which take place in a beam except those of direct compression which are of course taken care of by the concrete itself.

It will be apparent of course, that by having the beams correspond in width to the columns, the form or false-work may be of the simplest and most economical construction and arrangement and that unskilled labor may be employed in placing the reinforcing bars in position, as such bars are independent of each other and are not connected to each other other than by embedment in the concrete.

From the above description it will be apparent that I have produced a concrete construction possessing the advantages enumerated and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:—

1. A monolithic concrete structure, comprising vertical columns and horizontal beams and a flooring, a straight rod extending longitudinally through the lower portion of each beam over one column and terminating at its ends over the adjacent columns at opposite sides of the first-named column, and pairs of short straight rods arranged over each of said columns and extending longitudinally of and respectively embedded in the central and upper parts of said beams, and terminating at opposite sides of the underlying columns and short of the adjacent columns in the vertical plane of said beams.

2. A monolithic concrete structure, comprising vertical columns and horizontal beams and a flooring, the latter of less depth than the beam, a straight rod extending longitudinally through the lower portion of each beam over one column and terminating at its ends over the adjacent columns at opposite sides of the first-named column, a short straight rod extending longitudinally of and embedded in the upper part of each beam over each column and terminating at opposite sides of the column short of the adjacent columns in the vertical plane of said beam, and a straight rod of greater length than the said short rod and extending longitudinally of and embedded in each beam substantially at the center thereof between the first-named rod and the short rod embedded in such beam and over a column and terminating beyond the ends of the short rod overlying said column but short of the columns at opposite sides of said column and in the vertical plane of said beam.

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

ELBERT F. WILCOX.

Witnesses:

H. C. RODGERS,  
G. Y. THORPE.