C. A. P. TURNER.

SHORT SPAN FLAT SLAB BRIDGE.

APPLICATION FILED OCT. 1, 1909.

1,002,945. **Patented Sept. 12, 1911.**

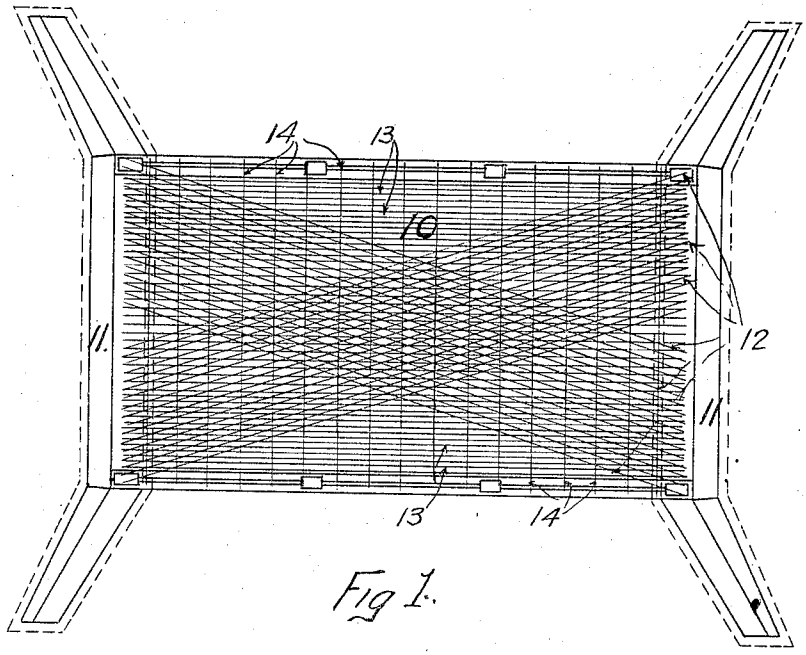

Fig 1.

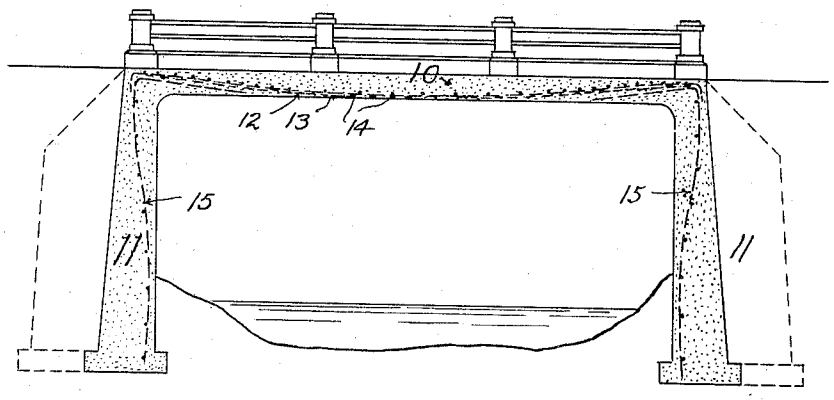

Fig 2.

WITNESSES

K. H. Burnside.

Pierce P. Turner

M. L. Augh

INVENTOR

C. A. P. Turner

Attorney

Chas. J. Williamson

UNITED STATES PATENT OFFICE.

CLAUDE A. P. TURNER, OF MINNEAPOLIS, MINNESOTA.

SHORT-SPAN FLAT-SLAB BRIDGE.

1,002,945. Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed October 1, 1909. Serial No. 520,592.

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 Short-Span Flat-Slab Bridges, and do hereby declare that the following is a full, clear, and exact description thereof.

In the construction of flat slab spans of reinforced concrete, particularly for bridge work, the practice prior to my invention has been to carry the main lines of reinforcements directly from abutment to abutment, and in parallel lines through the slab. This arrangement of the reinforcement is faulty, in that it fails to secure a satisfactory distribution of the strains under a concentrated load.

The object of my invention is to so arrange the reinforcement that under any concentrated load the entire reinforcement of the slab will be brought into action, and thus vibration reduced to a minimum, and in the attainment of my object, my invention consists in a flat slab of concrete reinforcement substantially as hereinafter specified and claimed.

In the accompanying drawings, Figure 1 is a top plan view of a short span highway bridge embodying my invention; and Fig. 2 a vertical longitudinal section thereof.

In the embodiment of my invention which I have selected for illustration, the flat slab 10 and the two abutments 11 are composed of an integral body or mass of concrete. Running through the slab diagonally are two belts or groups of parallel rods 12 which extend from abutment to abutment, the rods of one group, of course, crossing or intersecting the rods of the other group. In addition to the diagonally extending reinforcements, I employ reinforcements which also may be in the form of parallel rods 13, that extend directly from abutment to abutment across and filling the triangular spaces between each outer side edge of the slab and the central portion thereof, and I also employ transversely extending reinforcements likewise consisting of parallel rods 14. Of course the reinforcements may be in other forms than that of rods.

With a flat slab supported at two sides, as in the case of a bridge span, and reinforced in accordance with my invention, the strains are borne by all the reinforcements under any concentrated load, and besides this, there is a certain amount of flat plate action in the concrete which results in greater strength than is secured by the same section of metal when run directly from abutment to abutment as in the old practice, to which I have before referred. An important factor in securing the results mentioned is the diagonal arrangement of reinforcements running through the slab.

The abutments are preferably reinforced vertically, as by rods 15, which at their upper ends are bent downward into the slab, and extend horizontally thereinto.

The casting or formation of the abutments and slab in an integral mass or body, is of especial advantage in that it restrains the abutments at the top, and results in economy of the quantity of material required in the abutment as a retaining wall.

Having thus described my invention, what I claim is—

1. As an improvement in flat slab bridges of reinforced concrete, the combination of a flat slab, abutments for the slab supporting it at two sides, reinforcements extending in two belts diagonally through the slab from abutment to abutment, one diagonal belt crossing the other, the opposite sides of each belt extending, respectively, from diagonally opposite corners of the slab to or near the transverse center of the opposite abutment end of the slab, whereby the two diagonal reinforcements have a width equal to or substantially equal to the width of the slab at each abutment, reinforcements extending transversely of the slab and distributed therethrough from abutment to abutment, and reinforcements extending directly from abutment to abutment from the outer side of the slab inward.

2. As an improvement in flat slab bridges of reinforced concrete, the combination of

a flat slab, abutments supporting the slab at two opposite sides, groups of intersecting diagonal rods running through the slab from one abutment side thereof to the other, and extending at the abutment side over the entire, or substantially the entire width of the slab, and rods crossing the slab at right angles.

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

CLAUDE A. P. TURNER.

Witnesses:
L. KING,
A. T. FAY.