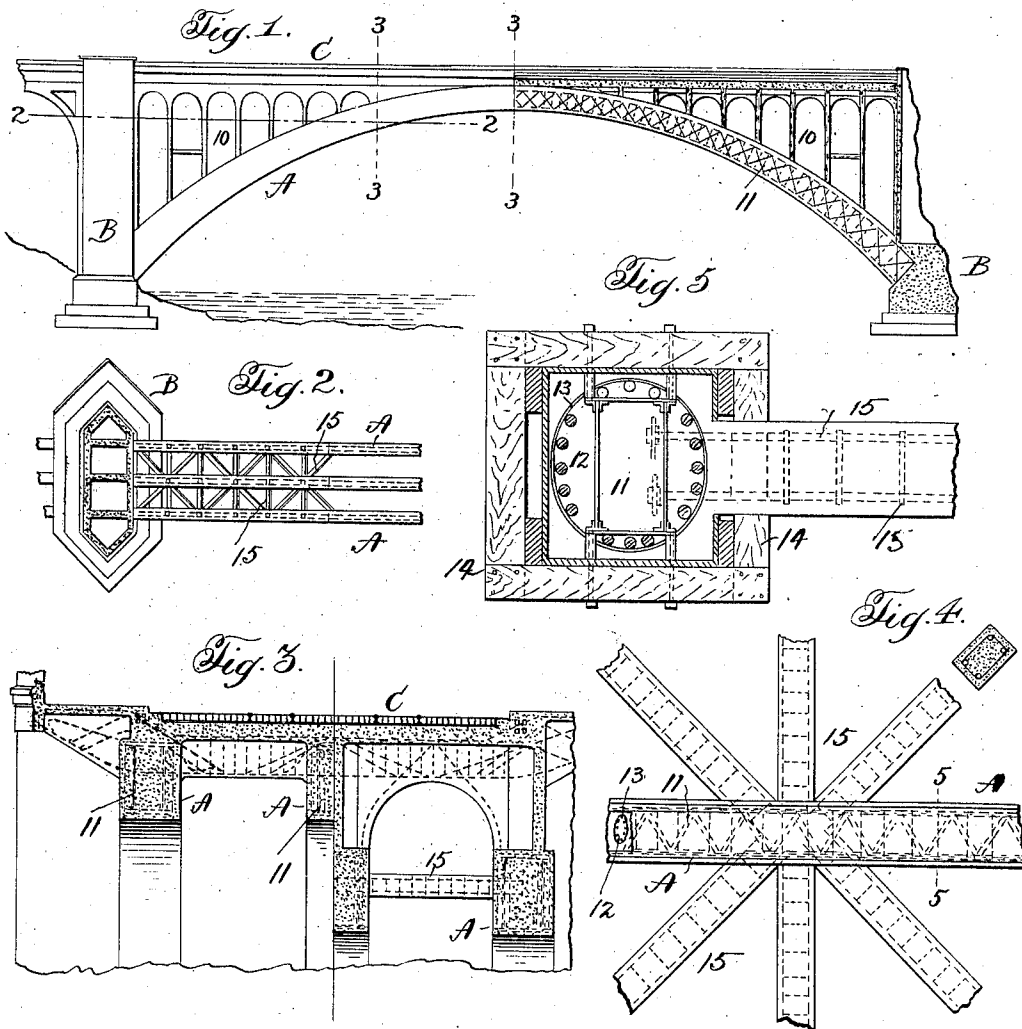


C. A. P. TURNER.
CONCRETE ARCH BRIDGE.
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1,002,944.

Patented Sept. 12, 1911.



Witnesses:
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Jm Bong.

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att'y

UNITED STATES PATENT OFFICE.

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

CONCRETE ARCH-BRIDGE.

1,002,944.

Specification of Letters Patent.

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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 Concrete Arch-Bridges, and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a view partly in side elevation and partly in section of a concrete bridge constructed in accordance with my invention; Fig. 2 a horizontal section on the line 2—2 of Fig. 1; Fig. 3 a cross section on the lines 3—3 of Fig. 1, the sections being taken at different points longitudinally of the bridge; Fig. 4 a detail view of a portion of one of the main ribs viewed in a plane tangent thereto, and of the lateral struts or braces; and Fig. 5 a detail view in cross section on the line 5—5 of Fig. 4, showing the manner of supporting the centering from the rib reinforcement.

The objects of my invention, generally stated, are to enable the construction of reinforced concrete arch structures, such as bridges, without connecting the floor and the ribs throughout their length as has been the practice heretofore, whereby the lateral stresses are carried by the floor, and to enable the rib centering to be supported in a more economical manner than by the methods or expedients hitherto employed, and for the attainment of these objects, as well as others which will hereinafter appear, my invention consists in the reinforced concrete arch constructed substantially as hereinafter specified and claimed.

The bridge which I illustrate in the drawings as exhibiting an embodiment of my invention, is one which I designed in which the span of the arch is three hundred and fifty feet, and it comprises three main ribs A, springing from abutments B, and a flat floor C consisting of a slab extending from abutment to abutment, and touching the ribs or arches only at their middle portions, vertical struts 10 rising at suitable intervals from the extrados of the ribs to the floor slab, such struts being of suitably reinforced concrete.

The rib reinforcement consists of a lattice box 11 and encircling the latter is a series of longitudinally extending rods 12 which in turn are encircled or inclosed by rings or

bands 13, so that the ribs are of hooped reinforced concrete, the rings or bands being secured together in any of the usual ways. I use the lattice box reinforcement for the ribs because it is well adapted for supporting the centering 14, one of the objects of my invention being to support the centering from the rib reinforcement instead of supporting the centering in the customary manner, for by supporting the centering from the rib reinforcement I reduce the cost of construction. The lattice box reinforcement may be erected from abutment to abutment, and suitably braced, or sustained by temporary supports, or it may be trussed at suitable intervals.

The ribs at points intermediate their central portions and the abutments are braced or supported for lateral strains by struts 15, preferably of reinforced concrete, that extend horizontally from rib to rib at right angles thereto and obliquely, or at an incline, and are secured or anchored to the ribs by having the strut-reinforcing rods embedded at their ends in the ribs. Between the floor and the ribs from the point toward the center where the trusses formed by the members 15 begin and inward from such inner limit of the trusses, brackets or diaphragm-braces 16 (see Fig. 3) connect the floor and ribs. An important result of the connection between the floor and ribs at the crown of the arch is that it reduces the extent of the lateral trusses that are required between the ribs.

Having thus described my invention, what I claim is—

1. In a concrete arch construction, the combination of reinforced concrete, spaced, arch-form ribs, a reinforced floor slab integral with the ribs at the central portion of the span, and a lateral system of trusses composed of members of reinforced concrete extending between the ribs at right angles and obliquely thereto, said system being situated intermediate said integral central portion of the structure and the abutments.

2. In a concrete arch construction, the combination of reinforced concrete, spaced, arch-form ribs, a reinforced floor slab integral with the ribs at the central portion of the span, and a lateral system of trusses composed of members of reinforced concrete extending between the ribs at right angles and obliquely thereto, said system being situated intermediate said integral central portion of

the structure and the abutments, and diaphragm braces connecting the floor slab and the ribs at a point inward from said system of trusses toward the center of the span.

5 3. In a concrete arch construction, the combination of arch-form lattice box reinforcement, longitudinally extending ribs distributed around said lattice box reinforcement, and hoops encircling said ribs.

10 4. In a concrete arch construction, the combination of arch-form lattice box rein-

forcement, longitudinally extending ribs distributed around said lattice box reinforcement, hoops encircling said ribs, and centering for casting the concrete supported directly from the lattice box reinforcement. 15

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

CLAUDE A. P. TURNER.

Witnesses:

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