No. 762,361. PATENTED JUNE 14, 1904.

J. B. STRAUSS & G. J. S. COLLINS.

BRIDGE.

APPLICATION FILED JAN. 25, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

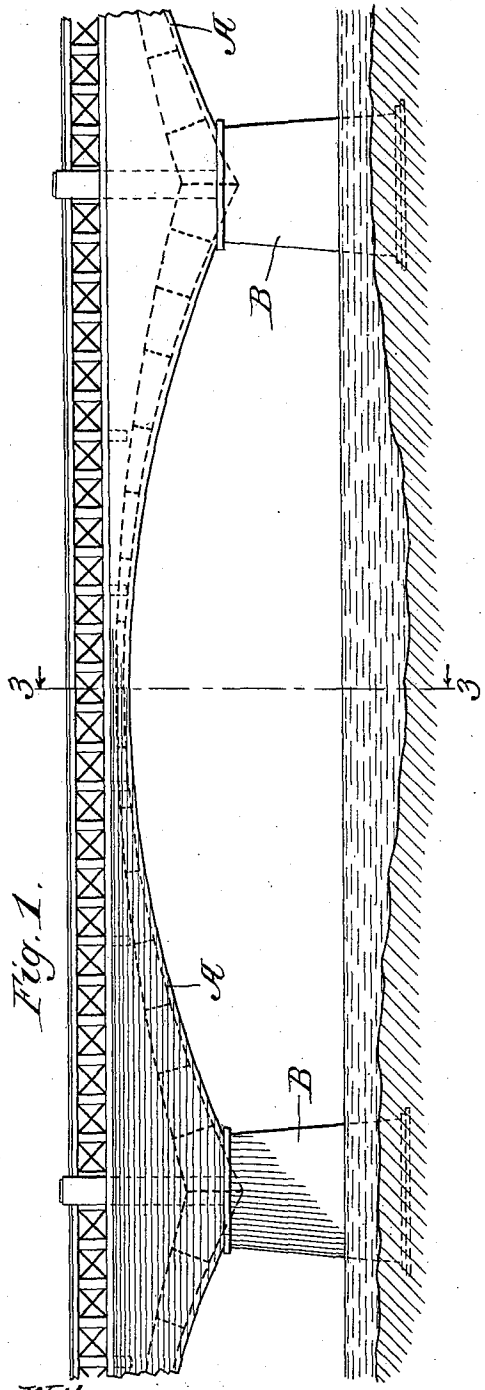

Fig. 1.

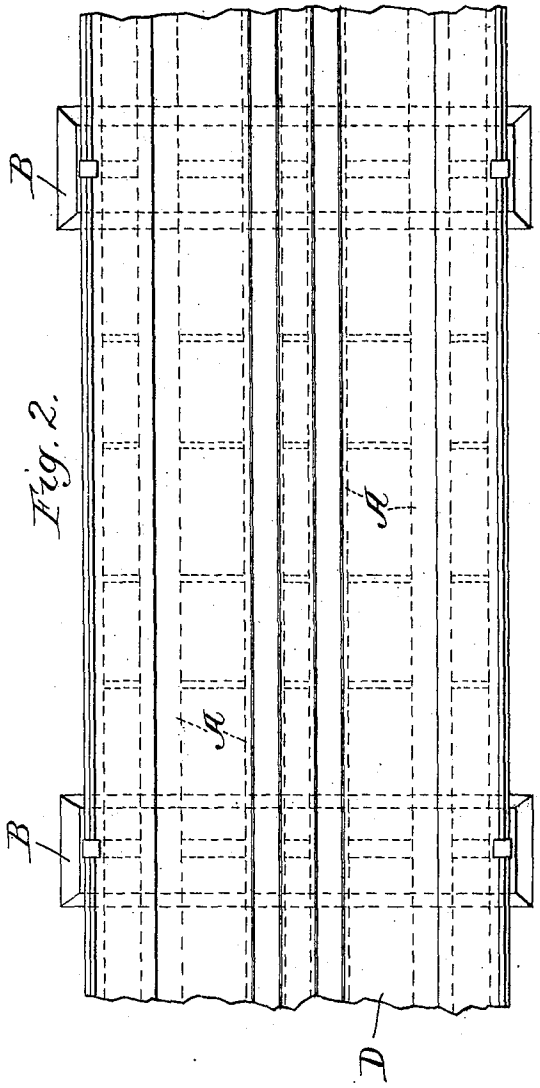

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

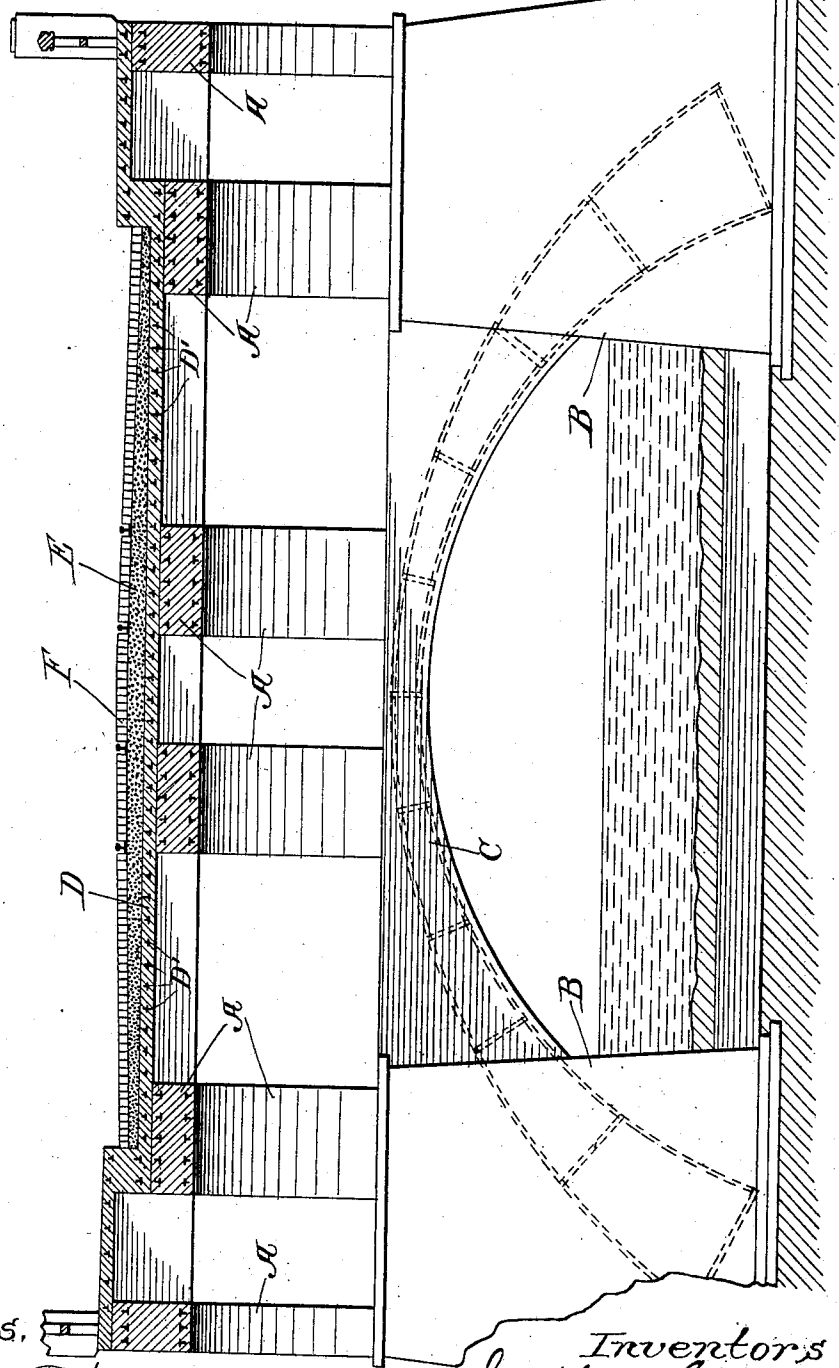

Fig. 3.

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No. 762,361. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

JOSEPH B. STRAUSS AND GEORGE J. S. COLLINS, OF CHICAGO, ILLINOIS.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 762,361, dated June 14, 1904.

Application filed January 25, 1904. Serial No. 190,513. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH B. STRAUSS and GEORGE J. S. COLLINS, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bridges, of which the following is a specification.

This invention relates to bridges, particularly those made from concrete, cement, and the like, and has for its object to provide a new and improved bridge of this description.

Our invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a portion of a bridge embodying our invention. Fig. 2 is a plan view of a portion of the bridge shown in Fig. 1. Fig. 3 is a section taken on line 3 3, Fig. 1.

Like letters refer to like parts throughout the several figures.

One of the objects of our invention is to provide a steel and concrete bridge which shall be cheap, strong, and durable.

As shown in the drawings, the bridge is provided with a series of substantially parallel longitudinal arched ribs or girders A, which extend from pier to pier. The piers instead of being continuous across the width of the bridge are separated, there being a series of such piers B, separated by a space, said piers being connected by a transverse arched rib or girder C. The longitudinal ribs or girders are connected by a deck or flooring D, which extends all the way across the bridge and which supports the roadway, which may be of any suitable construction.

In making the bridge we may, for example, first construct the piers and the transverse arched ribs or girders C. The longitudinal girders are then placed in position and are supported upon the piers and the cross-ribs. These longitudinal girders may be made up in any desired form, and, as shown, consist of a series of beams, which may be T or I beams or the like, and which are connected together by suitable cross-pieces and the like. Said beams are also used to form the floor or decking, as shown, and when in position the concrete or cement is run in place, so as to surround the metal and make a solid homogeneous stone or concrete structure having these separated longitudinal arched ribs and the continuous decking and the transverse ribs all combined, so as to form a monolithic structure. It will be noted that there are a series of metal beams D', forming the outline of the floor, and that the concrete is formed around these beams. It will be seen that in this structure the longitudinal arched ribs are mounted on piers which are separated both transversely and longitudinally, thus effecting a great saving in material and cost of construction. The transverse ribs strengthen and stiffen the supports and form a support for the longitudinal ribs, which in turn support and are stiffened by the decking or flooring, so that the structure produced is light, rigid, strong, and thoroughly monolithic. By this construction the strains on each part of the bridge can be accurately ascertained and provided for, while at the same time the essential feature of the structure acting as a unit is preserved. This construction permits the bringing of the line of thrust within the limits of the arched ribs, and thus secures the full arch action. We prefer to locate the longitudinal arched ribs or girders so as to be beneath the railroad-tracks, as shown, when such tracks are used. In this construction it will be seen that one part of the structure may give way without causing the destruction of adjacent parts. This construction also adapts itself to the settlement of the foundations and to variations in temperature without causing cracks or failures.

The steel or metal members preferably project from one part into the other, so as to more firmly unite the parts together.

The roadway may be made up in any desired manner, and as shown herein consists of a layer of sand or the like E, upon which rests a pavement F, of brick or other material.

We have illustrated a particular construction embodying our invention; but it is of course evident that the parts may be varied without departing from the spirit thereof. In some instances, for example, the bridge can be made without the steel or iron beams.

We have used the word "concrete" in the claims; but we use this term to include any

construction where cement or the like, either alone or in connection with other material, is placed in position in a plastic form and then allowed to set so as to form a solid structure.

We claim—

1. In a concrete bridge the combination of a series of substantially parallel, longitudinal ribs or beams, a solid transverse floor of less thickness than the ribs connecting them together, the whole united so as to form a homogeneous structure.

2. A concrete bridge comprising a series of substantially parallel, longitudinal, arched ribs or beams and a series of transverse arched ribs or beams, the transverse ribs or beams acting to support the longitudinal ribs or beams.

3. A concrete bridge comprising a series of piers separated longitudinally and transversely, a rib or beam spanning the transverse space between the piers and a series of ribs or beams spanning the longitudinal space between the piers, a solid transverse floor connecting the longitudinal ribs or beams the whole formed into a monolithic structure.

4. A concrete bridge comprising a series of separated metal girders, a series of metal beams forming the outline of the floor, the whole embedded in concrete so as to form a bridge provided with separated ribs having an integral, united floor of less thickness than the ribs.

5. A bridge comprising a series of substantially parallel, longitudinal ribs each composed of metal and concrete in combination, a series of transverse ribs composed of metal and concrete in combination, a series of supports for said ribs and a continuous floor spanning the distance between the longitudinal ribs and integral therewith, and composed of metal and concrete, the various portions of the metal framework adapted to interlock so as to unite the elements into a solid, homogeneous structure.

6. A concrete bridge comprising a series of piers separated longitudinally and transversely, a superstructure supported upon said piers and comprising a series of longitudinal ribs connected by a floor integral therewith and having a less thickness than the ribs.

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