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PATENTED APR. 30, 1907.

H. M. RUSSELL, JR.
REINFORCED CONCRETE ARCH.
APPLICATION FILED MAR. 23, 1906.

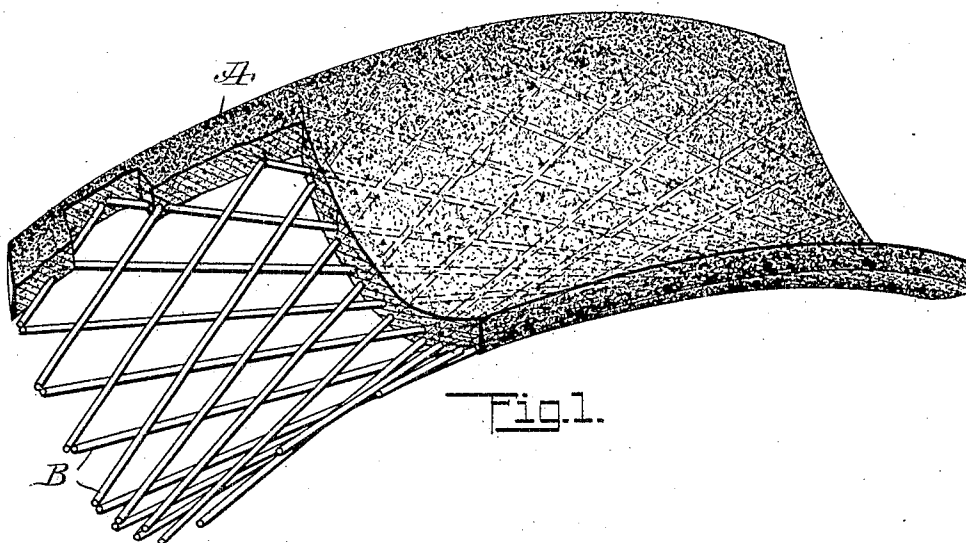


Fig. 1.

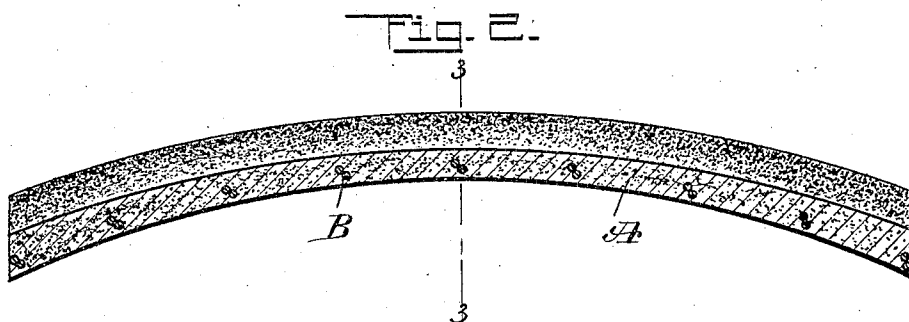
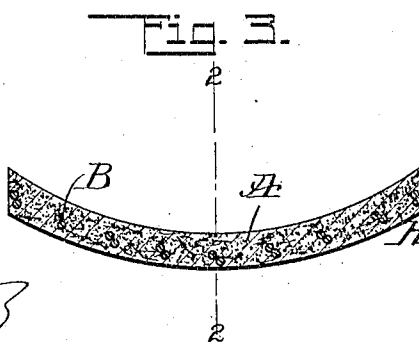


Fig. 2.



WITNESSES:

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HENRY M. RUSSELL, JR., OF WHEELING, WEST VIRGINIA.

REINFORCED CONCRETE ARCH.

No. 852,202.

Specification of Letters Patent.

Patented April 30, 1907.

Application filed March 23, 1906. Serial No. 307,610.

To all whom it may concern:

Be it known that I, HENRY M. RUSSELL, Jr., a citizen of the United States, and a resident of Wheeling, in the county of Ohio and State of West Virginia, have invented a new and Improved Reinforced Concrete Arch, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved concrete arch reinforced by steel or other material, and arranged to reduce the thickness of the arch to a minimum and still contain wholly within the concrete body the straight reinforcing metallic members, located in such a manner as to take up tensile stresses in the most effective manner.

The invention consists of novel features and parts and combinations of the same which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented on the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the improvement, part of the concrete body being removed; Fig. 2 is a longitudinal sectional elevation of the improvement on the line 2—2 of Fig. 3, and Fig. 3 is a transverse section of the same on the line 3—3 of Fig. 2.

The arch illustrated in the drawings consists essentially of a concrete body A and metallic reinforcing members B, preferably in the form of straight steel bars or rods. The cross section of the concrete body A is of an inverted arch shape, preferably of hyperbolic curvature, and the longitudinal section of the concrete body is preferably in the form of an ellipse, but I do not limit myself to either of the forms mentioned. The reinforcing metallic members B are straight and extend diagonally across each other to form a lattice or a network wholly embedded in the concrete body A. Some of the metallic members B extend diagonally from the abutment ends of the arch to the sides thereof, and some of the said members B extend diagonally from side to side of the arch, and by this arrangement it is possible to have the members B wholly embedded in the concrete body A notwithstanding that the arch is curved both in a longitudinal and in a transverse direction.

By the arrangement described an exceed-

ingly strong, and durable arch is provided in which the metallic reinforcing members take up tensile stresses, and the upward curvature of the cross section of the concrete body A besides increasing the strength of the arch permits of making the arch comparatively thin, thus saving considerable concrete material.

The concrete body may be made thickest at the abutment ends and graduated down to the top of the arch, at which it will be finished.

The arch described will be very useful as a bridge since it will, owing to the better bracing, permit of longer spans with less concrete material. The arch will also be useful in constructions where it is desirable to take the thrust off the abutments.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A reinforced concrete arch comprising a concrete body having a cross section of an inverted arch shape, and metallic reinforcing members embedded in the said concrete body, the said reinforcing members being straight.

2. A reinforced concrete arch comprising a concrete body having a cross section of an inverted arch shape, and metallic reinforcing members embedded in the said concrete body, the said reinforcing members being straight and crossing each other diagonally.

3. A reinforced concrete arch comprising a concrete body having a cross section of an inverted arch shape, and metallic reinforcing members embedded in the said concrete body, the said reinforcing members being straight and extending diagonally from the sides to the abutment ends.

4. A reinforced concrete arch comprising a concrete body having a cross section of an inverted arch shape, metallic reinforcing members embedded in the said concrete body, the said reinforcing members being straight, and sundry of the reinforcing members extending from one side to the other, and sundry of the said members extending from the sides to the abutment ends.

5. A reinforced concrete arch comprising a concrete body having a cross section of an inverted arch shape, metallic reinforcing members embedded in the said concrete body, the said reinforcing members being straight, and sundry of the reinforcing members extending from one side to the other,

and sundry of the said members extending from the sides to the abutment ends, the reinforcing members crossing each other to form a net work.

5 6. A concrete arch having its longitudinal section in the form of an ellipse and its cross section in the form of an inverted arch of hyperbolic shape.

10 7. A concrete arch comprising a concrete body having its longitudinal section in the form of an ellipse and its cross section in the form of an inverted arch of hyperbolic shape, and reinforcing members wholly embedded in the said concrete body.

15 8. A concrete arch comprising a concrete body having its longitudinal section in the form of an ellipse and its cross section in the form of an inverted arch of hyperbolic shape,

and reinforcing members wholly embedded in the said concrete body, the said members 20 being straight.

9. A concrete arch comprising a concrete body having its longitudinal section in the form of an ellipse and its cross section in the form of an inverted arch of hyperbolic shape, 25 and reinforcing members wholly embedded in the said concrete body, the said members crossing each other diagonally to form a net work.

In testimony whereof I have signed my 30 name to this specification in the presence of two subscribing witnesses.

HENRY M. RUSSELL, Jr.

Witnesses:

HENRY M. RUSSELL,
MARIA L. HOLLIDAY.