

D. B. LUTEN.
CONCRETE BRIDGE.
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1,060,920.

Patented May 6, 1913.

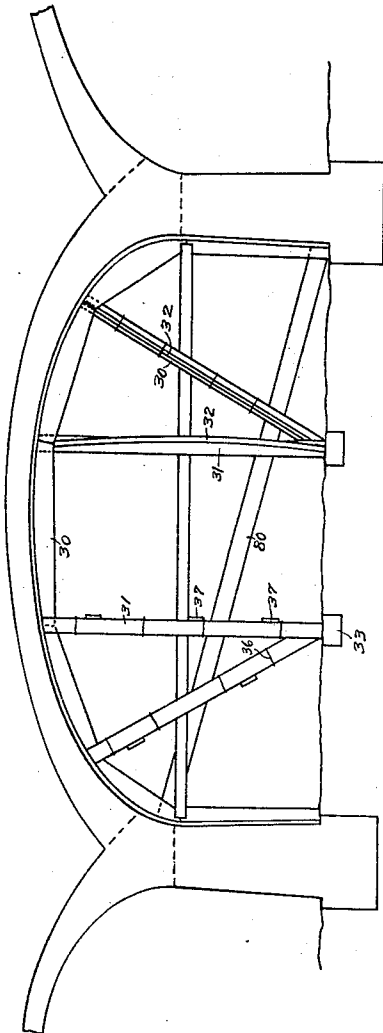


Fig. 1.

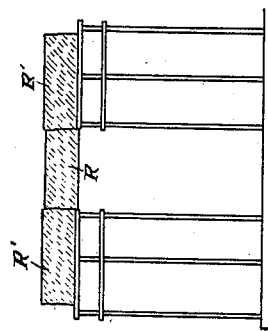


Fig. 2.

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UNITED STATES PATENT OFFICE.

DANIEL B. LUTEN, OF INDIANAPOLIS, INDIANA.

CONCRETE BRIDGE.

1,060,920.

Specification of Letters Patent.

Patented May 6, 1913.

Original application filed November 1, 1906, Serial No. 341,605. Divided and this application filed March 29, 1909. Serial No. 486,643.

RECEIVED

To all whom it may concern:

Be it known that I, DANIEL B. LUTEN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Concrete Bridges, of which the following is a specification.

The object of my invention is to produce a concrete structure under such conditions that the loads thereof will be properly sustained and, if there be any cracking it will be along predetermined lines which will neither reduce the strength of the structure nor affect its appearance; to construct an arch structure in successive rings which will be subjected to the stresses of their own weight at different periods in order that the settling and load stresses in one section of arch ring may be caused to counteract similar stresses in the adjacent arch ring or spandrel; and to provide such improvements in details and methods of construction as shall hereinafter be pointed out.

This application is a division of an application filed by me Nov. 1, 1906, Serial No. 341,605.

The accompanying drawings illustrate my invention.

Figure 1 is a longitudinal vertical section of an arch supported upon its centering. Fig. 2, is a transverse section of an arch showing the preferred manner of constructing the same in longitudinal rings.

The abutment or piers 21 are built to about the springing lines s and centering is erected for one of the arches at the middle of the axis thereof, the centering being wide enough to support a ring of reasonable width. The concrete is laid upon this centering and, in order that the load of the concrete may be uniformly applied I prefer to place the concrete simultaneously at the crown and the haunches, depositing concrete in opposite directions from these points until the entire ring is produced from skewback S to skewback S' , thus forming a ring R . By depositing the concrete in this way the arch is loaded at the crown and haunches simultaneously and there is but slight tendency for the ring to become distorted. After a ring has been produced the centering will be struck, the arch ring thereupon assuming the stresses of its own load generally by sinking slightly at the crown and corre-

spondingly rising at the haunches. Two sets of centering may then be arranged at opposite ends of the completed arch ring (see Fig. 2) and additional arch rings $R' R'$ are then produced in the same manner, allowed to set, and the centering then withdrawn, the operation being repeated as many times as may be necessary to complete the span.

The arches are completed in succession from skewback to skewback in the manner already described, the spandrel walls and the spandrel posts being left until the last. The adjacent sections having taken their settlement the spandrels will not settle materially and the usual cracks which occur in the spandrels near the haunches do not appear. After the end rings of the arches are completed the centering may be eased off before the spandrels are completed. A saving in centering may thus be effected by the repeated use of the centering in the same span.

I claim as my invention:

1. That improvement in the art of building a concrete arch, comprising erecting on supports an intermediate longitudinal section, permitting it to harden, then lowering the supports under that section, and subsequently constructing longitudinal sections contiguous to said intermediate section and on opposite sides thereof.

2. That improvement in the art of building an arch, comprising erecting on supports an intermediate longitudinal section, permitting it to harden, then lowering the supports under that section, and subsequently constructing longitudinal sections and bonding them to the first sections contiguous to said intermediate section and on opposite sides thereof.

3. That improvement in the art of erecting concrete arches, which consists in separately erecting upon supports three contiguous arch rings in two sets, one set comprising two rings and the other set comprising one ring, one of the sets being allowed to harden and its supports being removed before the erection of the other set, thereby balancing the effect of one set in its hardened condition against the effect of the other set.

4. That improvement in the art of building a concrete arch, comprising erecting on false-work supports an intermediate longitudinal section between proposed end sections, permitting it to harden, then lowering

the false-work supports under that section, and subsequently constructing on false-work supports the proposed end sections and bonding them to the intermediate section.

- 5 5. That improvement in the art of building an arch, comprising erecting on false-work supports an intermediate longitudinal section between proposed end sections, then
10 lowering the false-work supports under that section, subsequently constructing on false-work supports the proposed end sections and

bonding them to the intermediate section, and erecting superstructures on said end sections.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this fifteenth day of March, A. D. one thousand nine hundred and nine.

DANIEL B. LUTEN. [L. S.]

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."