

1,060,921.

2 SHEETS—SHEET 1.

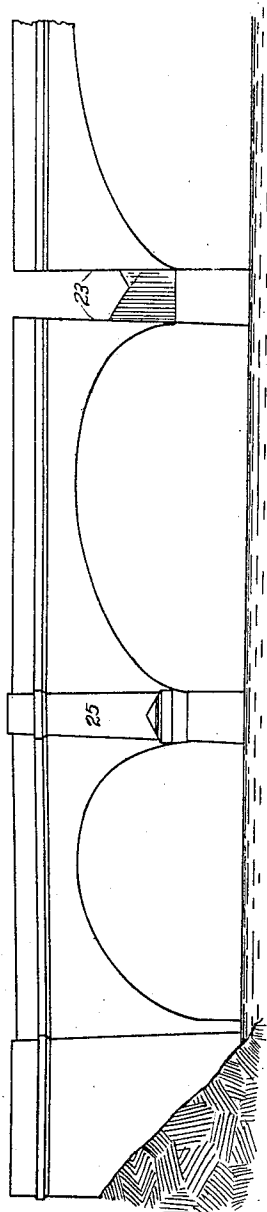


Fig. 1.

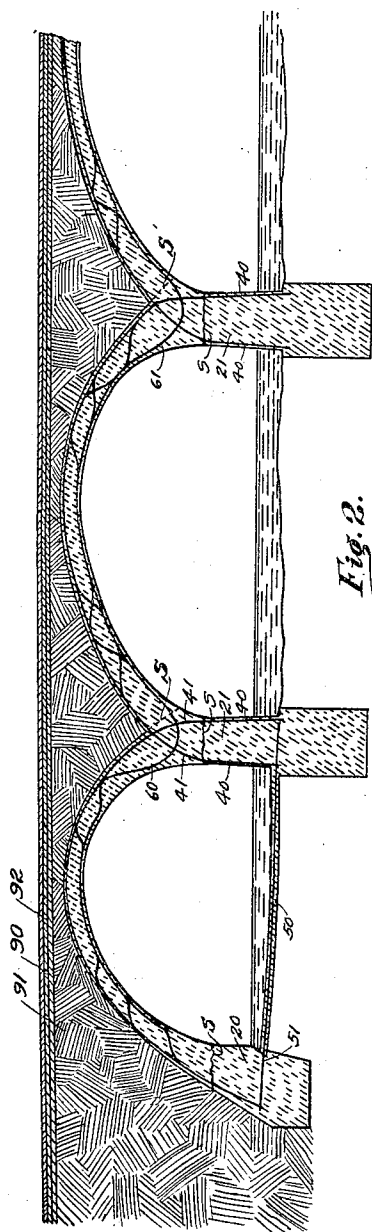


Fig. 2.

Witnesses
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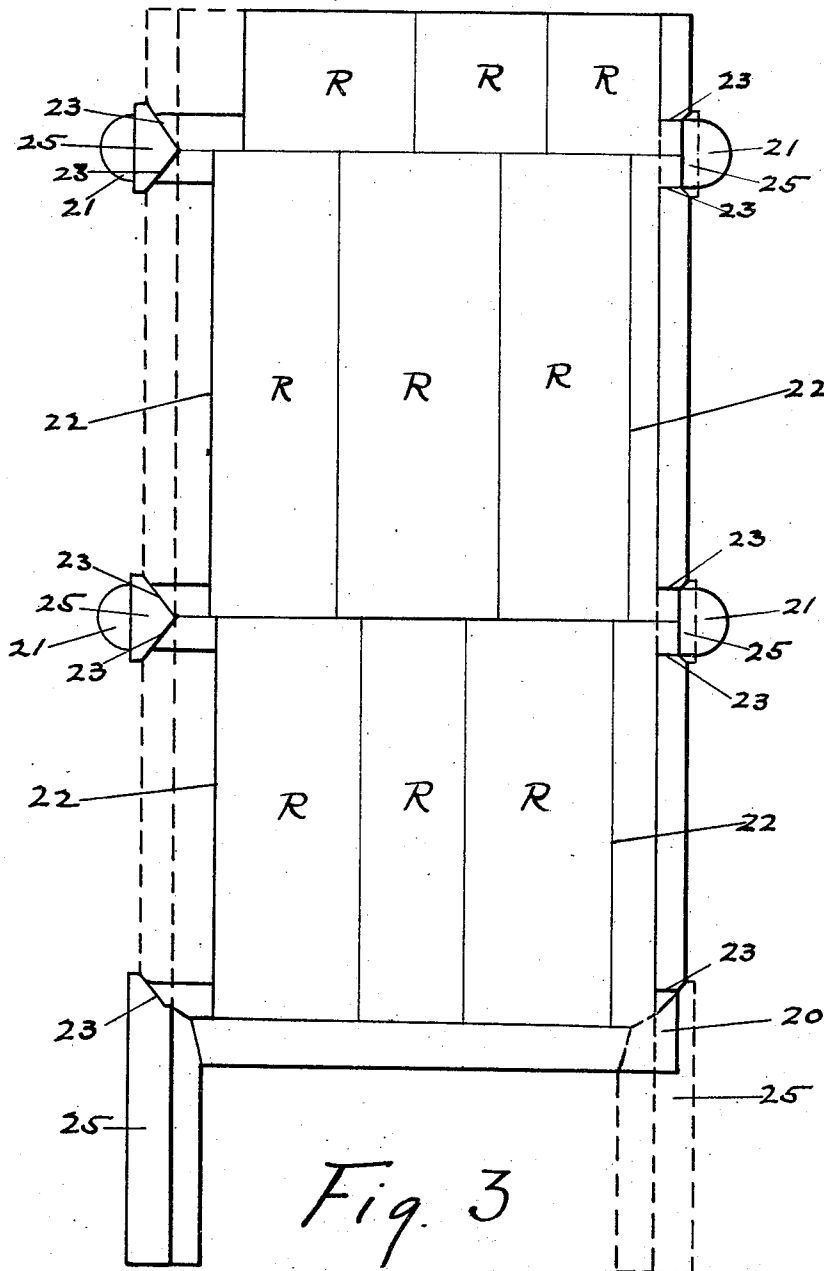
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CONCRETE BRIDGE.
APPLICATION FILED MAR. 29, 1909.

1,060,921.

Patented May 6, 1913.

2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

DANIEL B. LUTEN, OF INDIANAPOLIS, INDIANA.

CONCRETE BRIDGE.

1,060,921.

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. 486,645.

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 or hardened plastic 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 so construct an arch structure from concrete or other plastic that the joints between the work of different days will occur at points which will not injuriously affect the strength of the structure; 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 side elevation of a partially completed bridge structure showing several stages of construction; Fig. 2 a longitudinal vertical section; and Fig. 3 a plan showing steps in the construction.

The abutment 20 and piers 21 are built to the springing lines *s* and centering is erected for the arches. The concrete is laid upon this centering forming a ring *R* continuous from skewback to skewback. The intermediate rings *R*, *R*, of 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 ring built monolithically with the spandrel is continued from skewback to skewback similar to the other rings, but the spandrel is made continuous only from expansion joint to expansion joint, that is from end to end of span, the spandrels being completed to the vertical line 23 of the spandrel posts. After the spandrel walls have been allowed to set sufficiently to permit removal of the forms from the ends the spandrel posts 25 may

then be formed as indicated at the left of Fig. 1. By this means the joints in the arch are made parallel to the lines of thrust, the arch proper being divided into longitudinal rings as by vertical planes parallel to the roadway. The spandrels or side walls are monolithic with the outside rings, joints occurring only between an outside ring and its neighbor, and at the expansion joints which may be of any usual form as simply a vertical plane joint transverse to the wall near the ends of the span. The expansion joint does not, of course, continue across the arch ring but the arch ring is continuous to its skewbacks or to its springing. Thus the entire arch may be divided into rings and sections such that each one may be concreted continuously during a working day, and the construction discontinued at night at the joints as indicated. The extreme rings may be concreted, with the spandrel from expansion joint to expansion joint, one day for each spandrel wall. And finally the posts over the piers and abutments which I have designated as spandrel posts, may be concreted, thus providing for a distinct line of separation at the expansion joints, such that they will open readily when the arches settle, and not crack at other points.

My process consists then in concreting the spandrel walls continuously from expansion joint to expansion joint, and after hardening, placing the concrete on the other side of the expansion joint, and resting upon the pier or abutment.

I claim as my invention;

That improvement in the art of concrete arch construction, comprising the erection of a spandrel wall integral with the arch ring and ending near the end of the span, and after hardening, the subsequent erection of a spandrel end resting upon but not integral with, the abutment of the arch.

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:

C. H. KNIGHT,
THOMAS W. McMEANS.

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