No. 693,280. Patented Feb. 11, 1902.

L. LANE.

ARCH.

(Application filed Oct. 28, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

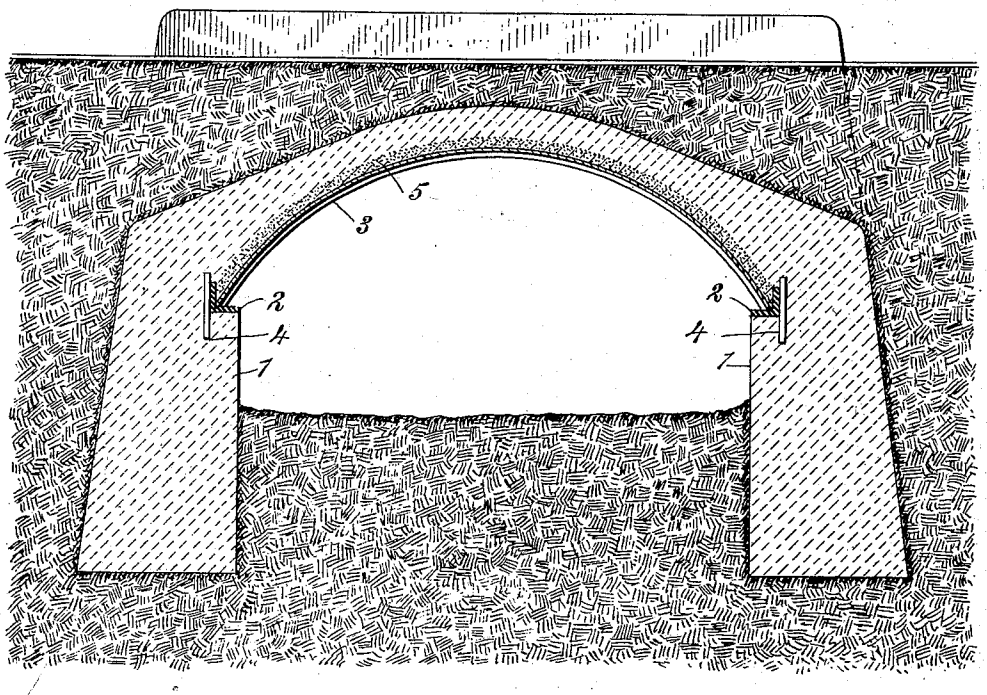
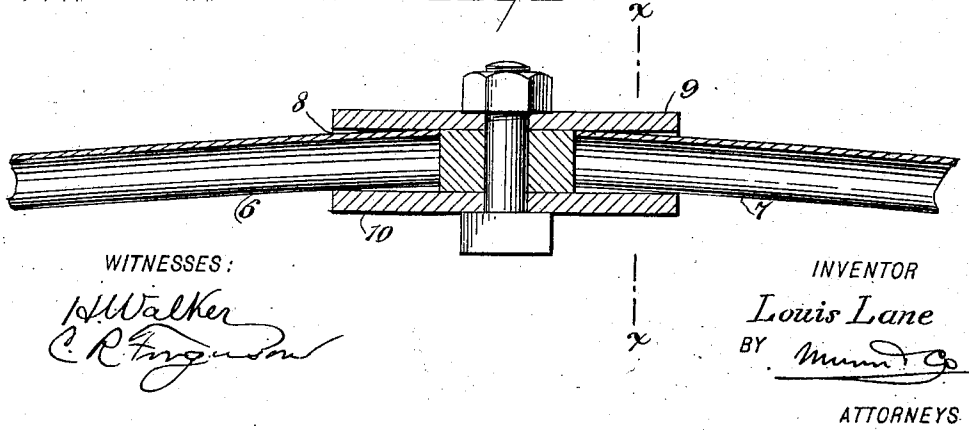


Fig 3



WITNESSES:

H. Walker

C. R. Ferguson

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Fig 2

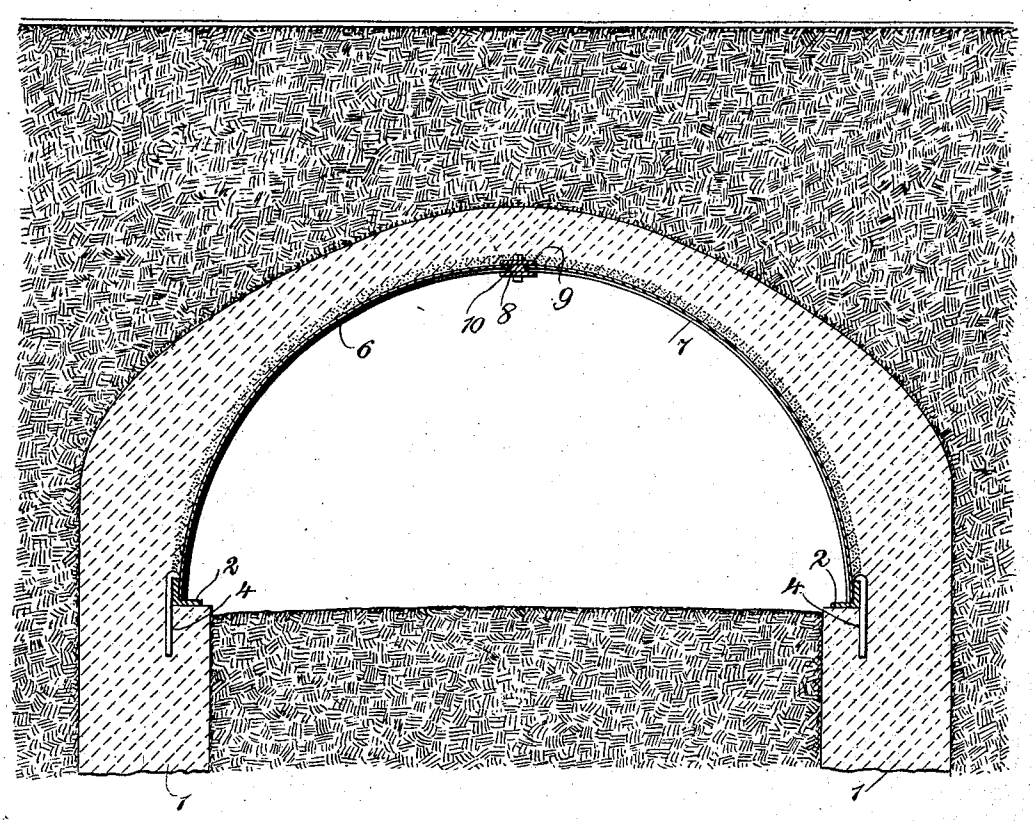
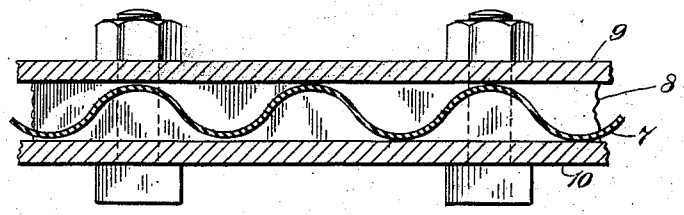


Fig 4



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UNITED STATES PATENT OFFICE.

LOUIS LANE, OF TOLEDO, OHIO.

ARCH.

SPECIFICATION forming part of Letters Patent No. 693,280, dated February 11, 1902.

Application filed October 28, 1901. Serial No. 80,273. (No model.)

To all whom it may concern:

Be it known that I, LOUIS LANE, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a new and Improved Arch, of which the following is a full, clear, and exact description.

This invention relates to improvements in the construction of small arch bridges, culverts, and the like, the object being to provide an arch for such structures of simple construction, easy to build, durable, and cheap.

I will describe an arch embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of an arch embodying my invention. Fig. 2 is a sectional elevation showing a modification. Fig. 3 is a sectional detail showing a form of key employed in the structure illustrated in Fig. 2, and Fig. 4 is a section on the line $x\,x$ of Fig. 3.

Referring to the drawings, 1 designates the abutments, on the upper portions of which are placed the angle-irons or skewback-bearings 2 to receive the ends of the arch-plates 3. In the construction of the arch dowels 4 may be placed in the material rearward of the angle-irons, so as to prevent any possible displacement of the angle-irons during such construction. The plates 3 are of any suitable thickness, and to provide for a considerable strength with a comparative lightness of a plate or plates the said plate or plates are corrugated from side to side—that is, in the direction of their curve. After placing the plate or plates 3 the arch ring 5 is placed in position, this arch ring consisting of concrete, and between the concrete and the plate or plates a rich mortar is used, the metal and concrete being structurally united by reason of the well-known property of adhesion of cement to iron, and forms a compounded structure of great strength and efficiency. The metal also being on the under exposed side forms a shell to protect the concrete from the elements or from other injury. The metal arch I prefer to have a rise of approximately one-fourth its span and is one that may be of the so-called "lineal-arch" form. By thus proportioning and employing the metal arch-plates I save the trouble and expense of temporary centering, which has rendered the use of such arches impractical in many localities, owing to the great diversity of size and proportions.

In Fig. 1 I have shown the arch-plate as made in one length from side to side, and this is used where a limit of one hundred and twenty inches for such sheets will permit it. Where the span exceeds this, I overcome the difficulty by a special construction, as illustrated in Fig. 2.

In Fig. 2 I show the arch as comprising two corrugated plates 6 and 7, which at their upper ends connect with a key comprising a bar 8, having flanges 9 10 at the upper and lower sides, which project to engage the upper and lower surfaces of the arch-plates, these plates 9 and 10 being bolted to the bar 8, as clearly shown in the drawings.

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

1. An arch, comprising abutments, bearing-irons on said abutments, dowels with which the rear sides of the irons engage, an arch-plate mounted on said bearing-irons, the said plate being corrugated in the direction of its curve, and a concrete-arch ring, substantially as specified.

2. An arch, comprising abutments arch-plates resting on the abutments and extended at their upper ends to the center of the arch, and a key connection between said upper ends, and engaging with the upper and under sides of the plates, substantially as specified.

3. An arch, comprising abutments, arch-plates springing from said abutments, the said plates being corrugated in the direction of their curve, a key-bar arranged between the upper ends of the plates, and plates secured to said bar and engaging against the upper and under surfaces of the arch-plates, substantially as specified.

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

LOUIS LANE.

Witnesses:
ROY GARFIELD LANE,
MYTLE E. FASHBAUGH.