

W. S. LEVACK,

TRUSS BRIDGE.

No. 104,969.

Patented July 5, 1870.

Fig. 1.

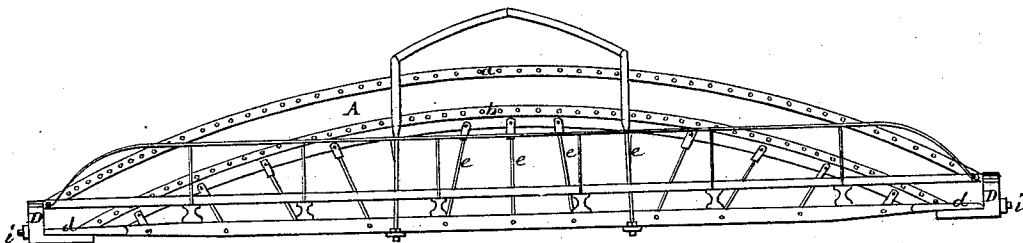
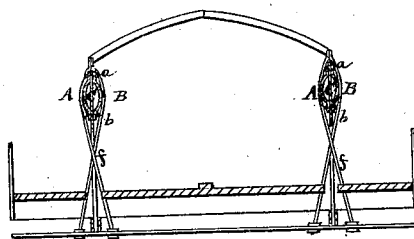


Fig. 3.



Fig. 2.



Attest,  
Geo. W. Tibbitts

J. Holmes

Inventor,  
W. S. Levack

# United States Patent Office.

WINFIELD SCOTT LEVAKE, OF CLEVELAND, OHIO.

Letters Patent No. 104,969, dated July 5, 1870; antedated June 2, 1870.

## IMPROVEMENT IN TUBULAR-ARCHED BRIDGES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WINFIELD SCOTT LEVAKE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Tubular-arch Bridges; and I do hereby declare that the following is a full and complete description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a side view.

Figure 2 is a vertical cross-section.

Figure 3 is a detached view of the foot-block.

Like letters refer to like parts.

The nature of this improvement relates to the construction of tubular arches for iron bridges and other suitable purposes, and consists of three plates of iron, two of said plates being bent in such a manner as to form grooved or channel plates, and, at the same time, being curved or arched edgewise, the other or third plate being flat and curved edgewise to correspond to the curve of the channel-plates.

These plates being put together and riveted, as seen in figs. 1 and 2 in the accompanying drawing, form a tubular arch, having the center plate vertical, the object of which is to give great strength to the arch in supporting a bridge or other structure.

The method of constructing these tubular arches is as follows:

The plates A and B are to be rolled in a mill for that purpose, in the form of a half-round or semi-oval channel-plate, having flanges *a b*; these plates, at the same time, are to be curved edgewise at any required degree to form the arch, thus making, as they come from the mill, plates already arched, and bent to form, when two of these are placed together, a tubular arch.

The center plate C is rolled or cut curved or arched, similar to the plates A B, and, when constructing the arch, is placed between them, and forms a partition vertically through the entire length of the tube, the same rivets holding them all together.

It will be observed that this plate C being in a vertical position, gives very great strength to the arch, as it will support much greater weight edgewise than

otherwise, while the plates A B, which form a tubular arch, are capable of resisting lateral swaying.

The plate C may be wider than the plates A B, and project lower, for the purpose of attaching the rods *e e*, for supporting the floor and other parts of the bridge.

A foot-block, D, fig. 3, is provided, having grooves, in which the ends of the arch sit; the rods *d d* of the chords of the bridge passing through them, and secured by nuts *i i*, fig. 1.

Cross-beams or rods *f* may also be used, if necessary, on large bridges, to prevent any lateral swaying.

By this mode of constructing tubular arches much time and labor are saved, as the iron may be rolled ready for the purpose, and a less amount of riveting or bolting is required; it also makes a much neater appearing piece of work.

These arches are also very useful as steamboat arches, and for all uses to which arches are put.

Constructing arches as above described enables them to be very easily made proportionate in strength to the weight to be sustained, as the center plate C may be varied in width and thickness, as circumstances require, as upon it depends, to a considerable degree, the weight of the structure of the bridge, or it might be made wider and thicker in the central portion where the greater strain would be.

A swing or turn-table bridge can be easily made by uniting two of the herein-described arches in the form of an ellipse, one arch being above and the other below the floor of the bridge, the ends of the arches being secured in double foot-blocks, one pair of chord-rods, *d d*, being sufficient, the rods *e e* reaching through from one arch to the other.

What I claim as my improvement, and desire to secure by Letters Patent, is—

A tubular arch, constructed of the grooved arch-plates A B and center plate C, substantially as described, and for the purpose set forth.

W. S. LEVAKE.

Witnesses:

GEO. W. TIBBITTS,  
GEO. HESTER.