(No Model.)

W. A. NICHOLS.

BRIDGE OR CULVERT.

No. 538,432. Patented Apr. 30, 1895.

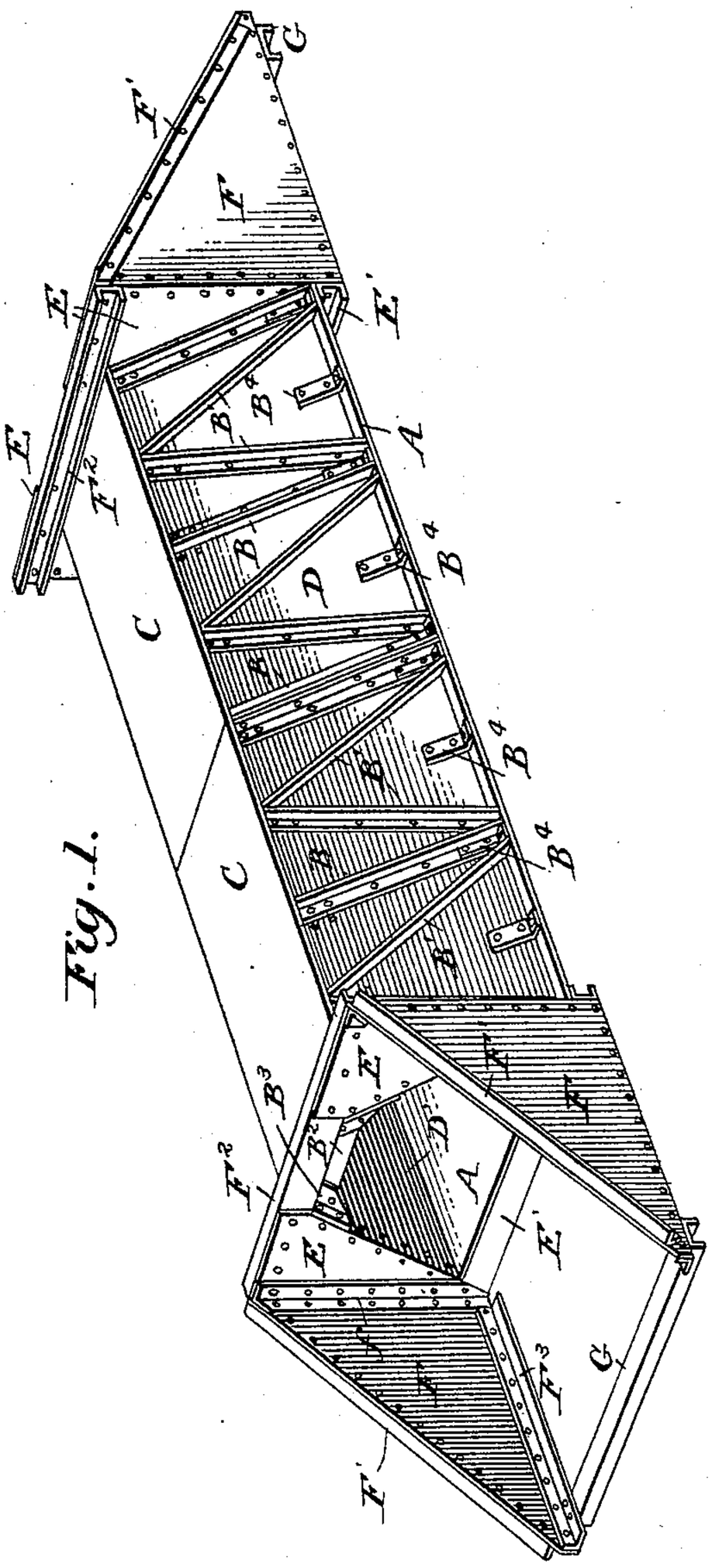

Fig. 1.

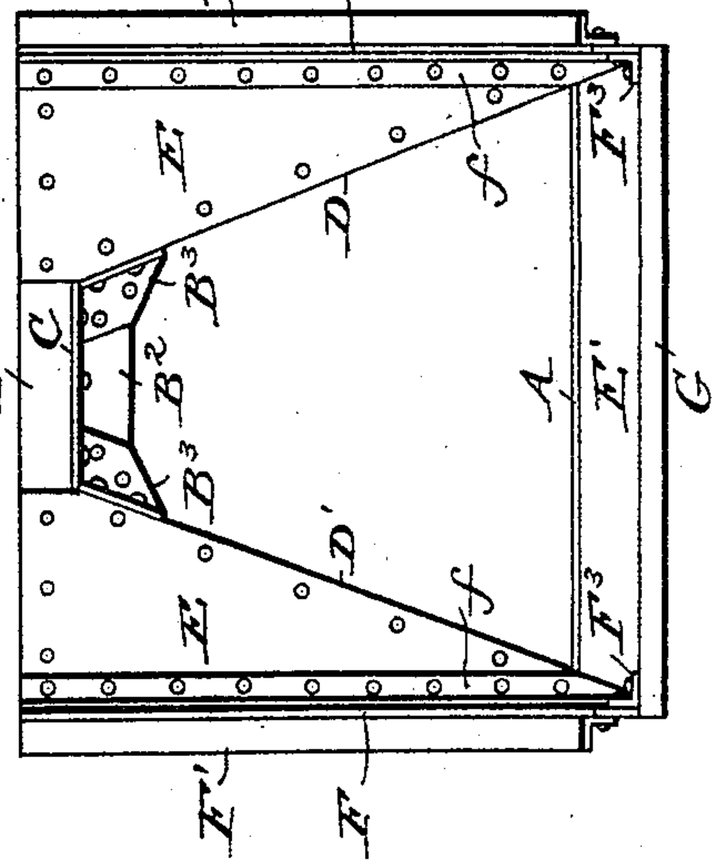

Fig. 3.

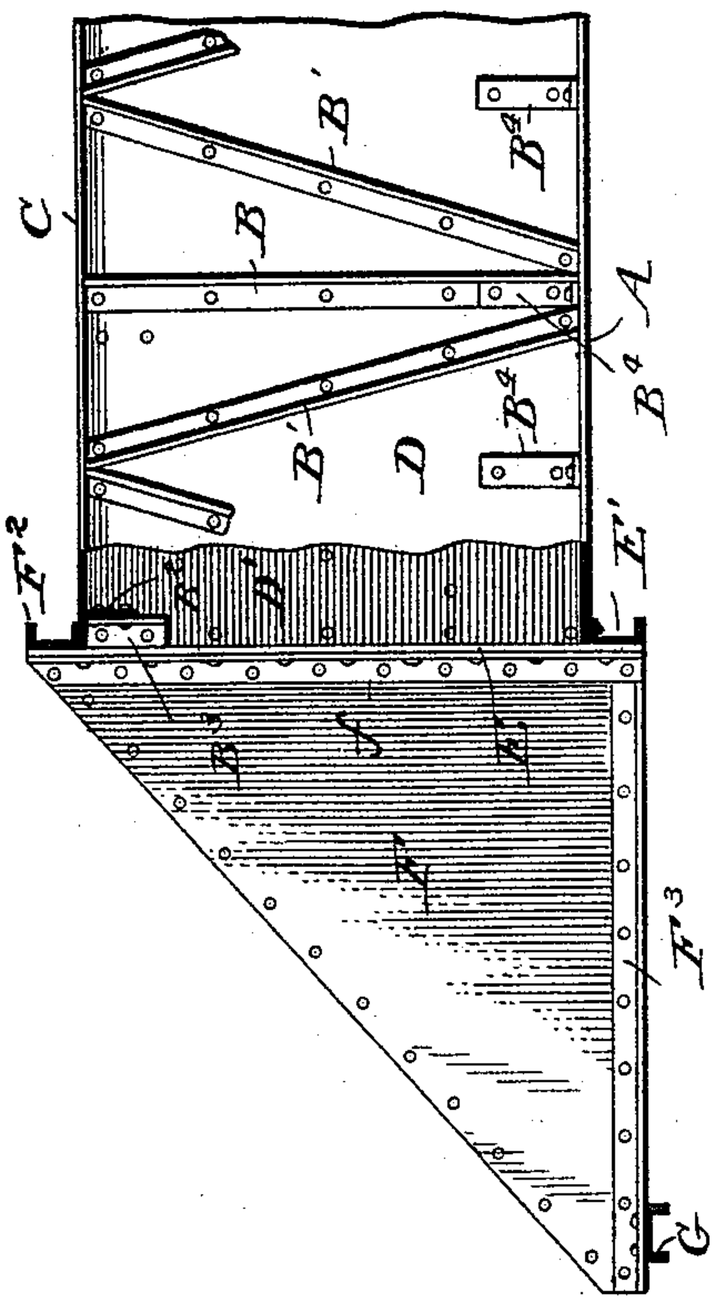

Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM A. NICHOLS, OF WAYNE, PENNSYLVANIA.

BRIDGE OR CULVERT.

SPECIFICATION forming part of Letters Patent No. 538,432, dated April 30, 1895.

Application filed January 28, 1895. Serial No. 536,477. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. NICHOLS, a citizen of the United States, residing at Wayne, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Bridges, of which the following is a specification.

My invention relates to bridges or culverts, and more especially to that class which are termed "portable," and which are adapted to be used in road-ways where there are small streams, wet or boggy places, drains, or places for waste water and the like, and it has for its object to improve the construction of such bridges or culverts whereby they are better adapted for the purposes set forth, and the invention consists in such a bridge embodying the features substantially as hereinafter more particularly set forth.

My present invention is more particularly an improvement on the construction shown in Patents Nos. 392,094 and 487,819.

Referring to the accompanying drawings, Figure 1 is a perspective view of a bridge or culvert made in accordance with my invention. Fig. 2 is a side view partly in section, and Fig. 3 is an end view.

The bridge may be made in sections, which may be riveted or otherwise secured together to make a bridge of the desired length, and in Fig. 1, I have shown, for convenience of illustration, a bridge of two sections, and having at each end means which shall serve as guide-ways for the water passing through the bridge, as well as act as anchors or means of securing the bridge in position, and for preventing the surrounding earth from getting into the bridge or culvert, although of course, it will be understood that it is not always necessary to use such means at both ends of the bridge, or they may be omitted altogether.

The bridge or culvert is preferably made of iron or steel, the parts being riveted or otherwise secured together, although in some instances it is practicable to use other materials, but under all circumstances the bridge is portable and contained within itself and can be readily placed in the desired position, the various sections being united to make it of the length necessary for any particular use.

The bridge comprises a base plate A, shown as being of a sheet of metal, and secured to said sheet are the truss pieces, B, B′, which are preferably made of angle iron in substantially the manner indicated, to render the bridge strong and not liable to distortion under strains, the truss pieces B, extending at right-angles from the base, while the truss pieces B′, extend at a less angle to form braces, as indicated. The truss pieces B, B′, are united to the side pieces D, D′, by being riveted or bolted thereto, which side pieces extend from the bottom plate A, upward to the end of the truss pieces, and these not only give great strength to the bridge, but furnish a clear run-way inside for the passage of water or other material, without obstruction from inwardly projecting trusses or other parts of the device. The upper ends of the trusses are united by the horizontal cross-pieces B^2, and in order that these may be readily and easily attached to the side pieces I provide angle pieces B^3, which are, respectively riveted or bolted to the side pieces D, D′, and to the cross-pieces B^2. Mounted upon these cross-pieces B^2, is a cover C, which is secured also by rivets or bolts, and preferably projects out at its edges beyond the side pieces D, D′, so as to include and cover the upper ends of the truss pieces. Other angle pieces, as B^4, may be applied between the truss pieces to further secure the parts together, although in some instances these are not necessary.

From this description it will be seen that I am enabled to provide a very simple structure, which at the same time is exceedingly strong and capable of supporting severe weights or strains in all directions, and also provide a free run-way for the water.

In order to provide means for guiding the water to the bridge, as well as to form an anchorage therefor and to prevent the earth or dirt from falling before the mouth of the bridge or culvert, I attach to the end of the bridge a face plate or plates E, which extend upward beyond the top of the bridge and laterally beyond the sides, and preferably form a rectangular face plate surrounding the opening to the bridge. This plate also extends below the bottom of the bridge, and the parts thereof are united by a plate E′, which is preferably shown as U-shaped. The plate is also provided with wings F, F, on either side which are preferably angular in shape, and which

may be secured to the face plate by the angle plates *f*. The outer edges of these plates are also turned over or provided with angle plates F′, while at the rear I preferably provide a U-shaped plate F^2. The outer ends of the wings are connected by a sill G, which is shown as made of U-shaped plates, and as being secured to the under side of the wings, while on the lower inner sides of the wings are arranged the L-shaped plates F^3, and these are preferably on a plane below the level of the bridge. The object of arranging the bridge in this manner is that when the bridge or culvert is placed in position, the space between the sill and the face plate E, may be filled with paving, as stone or other material to prevent the water flowing through the bridge or culvert from washing away the earth in front thereof. The face plates not only serve as anchors for the bridge, but prevent the earth or dirt surrounding the bridge from getting into the opening thereof, and the U-shaped pieces furnish a convenient means for paving or otherwise packing the material around the bridge to make a tight joint. The angle bars F′, projecting at the sides also serve as an abutment against which the earth or paving may be placed, and it will thus be seen that the earth or paving material can be packed closely all around the bridge in such a manner that it is not liable to be washed into the bridge, there being abutments all around the opening.

It will be observed that the bridge or culvert can be constructed from ordinary commercial forms of metal, requiring no special rolling or forming, and that when the parts are put together in the manner indicated, it constitutes an exceedingly simple yet strong bridge or culvert, which may be placed in position and furnish a ready means for the passage of water, and the earth or other surrounding packing will not be liable to be washed into the bridge or the water to wash the packing away from the bridge or undermine it.

What I claim is—

1. A portable bridge or culvert, comprising the bottom A, the truss pieces secured thereto, the side pieces secured inside the truss pieces, the cross-pieces secured to said side pieces, and the top secured thereto, the parts being riveted or otherwise joined, substantially as described.

2. A portable bridge or culvert comprising the bottom, sides and top plates secured by truss pieces and having the face plates secured to the end of the bridge and extending beyond the same, substantially as described.

3. The combination with a bridge or culvert, of the face plates secured thereto, the wings connected to the face plates, and a sill uniting the outer ends of the wings, the face plates and wings extending beyond the limits of the bridge or culvert, substantially as described.

4. The combination with a bridge or culvert, of the face plates and wings and the angle pieces attached thereto forming lateral extensions or abutments for the earth or packing material surrounding the bridge, substantially as described.

5. The combination with a bridge or culvert, of the face plates secured thereto and projecting above and at the sides beyond the bridge, the angle pieces E′, F^2, above and below the bridge, the wings connected to the face plates, the sill connecting the wings, and the angle plates F′, F^3, secured to the wings, substantially as and for the purpose set forth.

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

WILLIAM A. NICHOLS.

Witnesses:
F. L. FREEMAN,
A. N. DOBSON.