(No Model.) 2 Sheets—Sheet 1.

A. G. PRATT.

BRIDGE.

No. 597,590. Patented Jan. 18, 1898.

Fig. I.

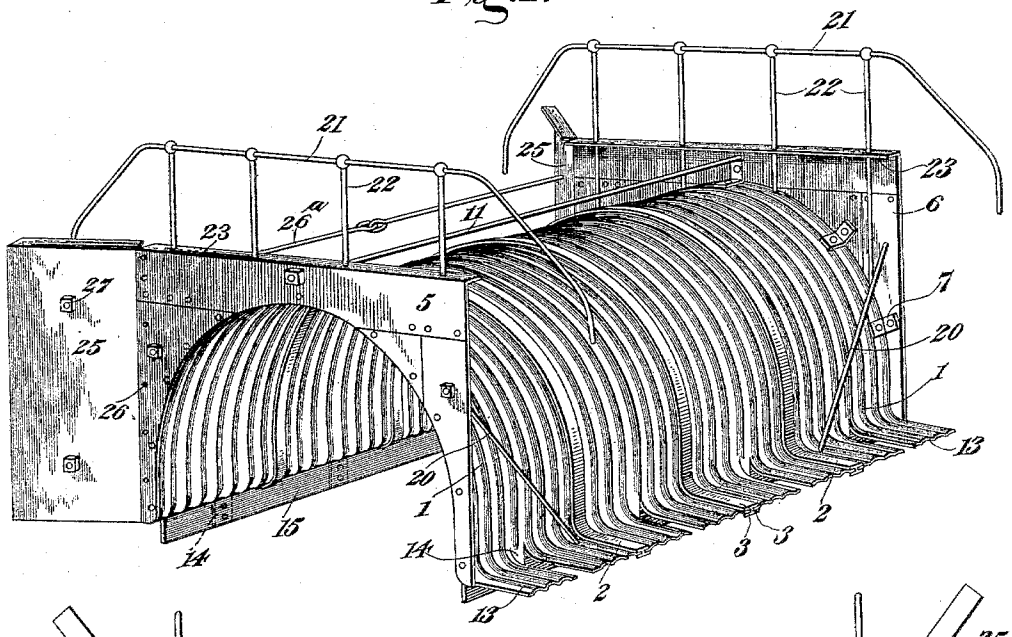
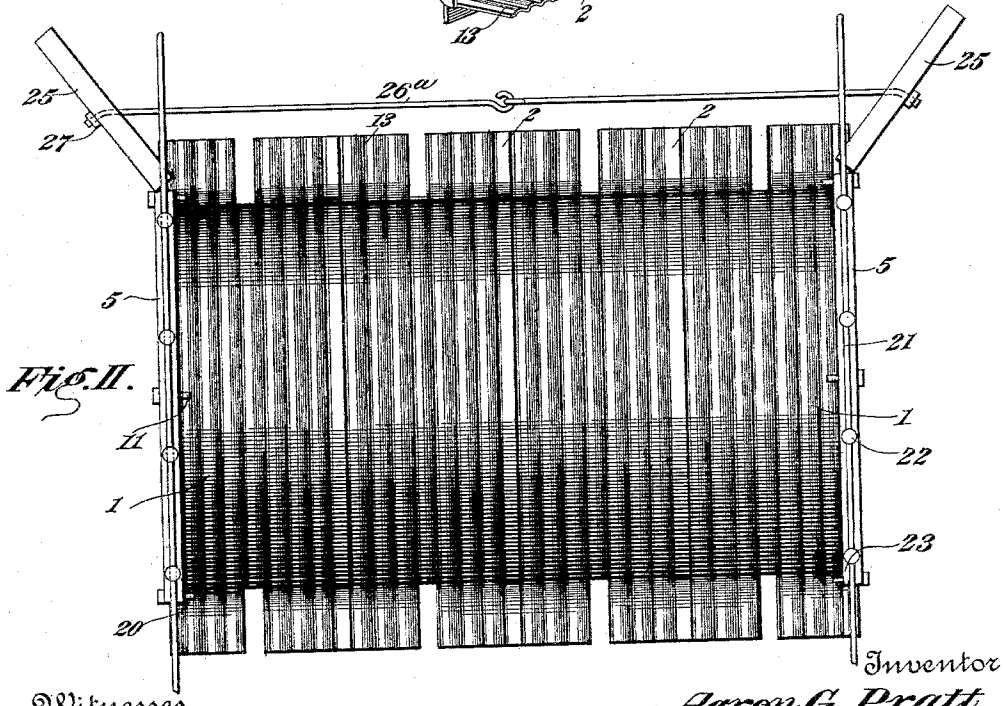


Fig. II.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. III.

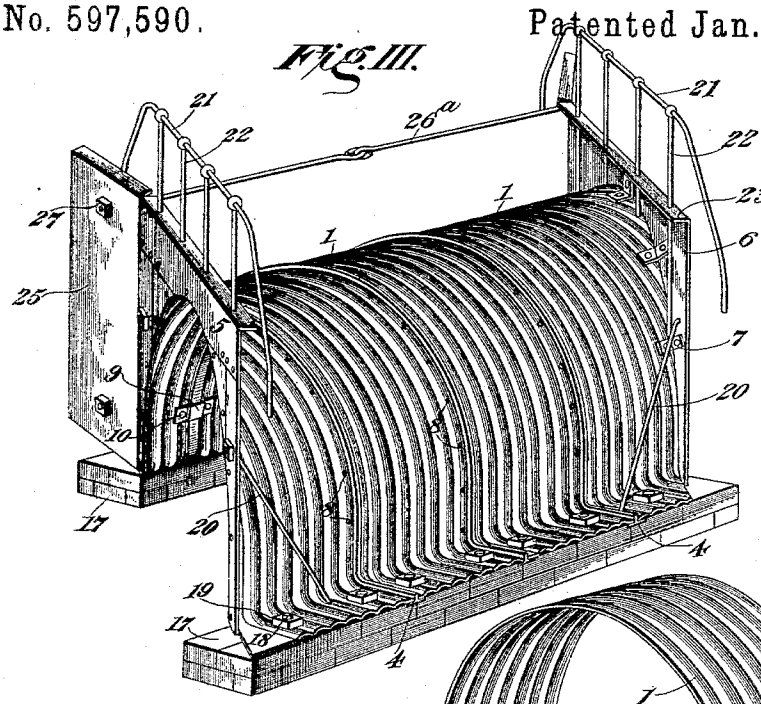


Fig. V.

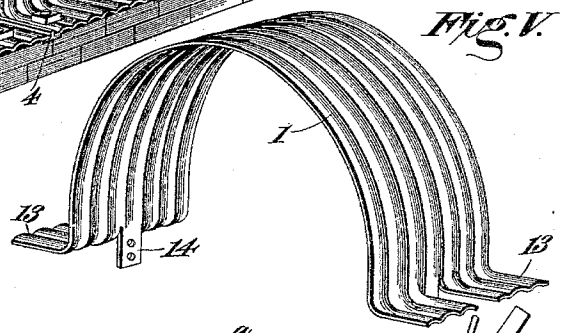
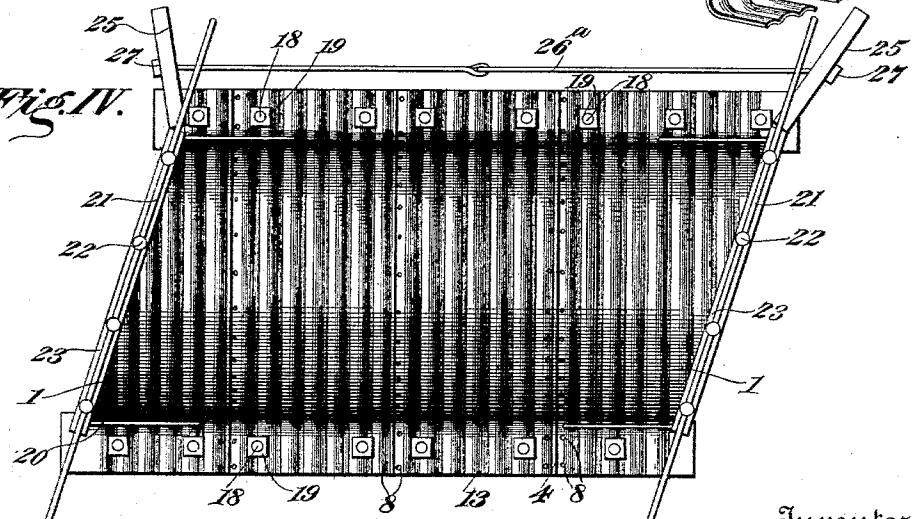


Fig. IV.



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UNITED STATES PATENT OFFICE.

AARON G. PRATT, OF HAMMONDSPORT, NEW YORK.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 597,590, dated January 18, 1898.

Application filed March 26, 1897. Serial No. 629,393. (No model.)

To all whom it may concern:

Be it known that I, AARON G. PRATT, of Hammondsport, in the county of Steuben, State of New York, have invented certain new and useful Improvements in Bridges, of which the following is a complete specification, reference being had to the accompanying drawings.

My invention relates particularly to bridges or culverts that are adapted to be buried underground and are designed to constitute a viaduct over small streams or marshy places.

The object of my invention is to produce a simple, comparatively inexpensive, and durable bridge of that class and of the kind generally termed "portable."

Various specific objects are also aimed at in the construction of my bridge, and such I shall hereinafter describe in detail, and succinctly specify in the appended claims.

In the drawings, Figure I is a perspective view of one form of my bridge complete. Fig. II is a top plan view of the same. Fig. III is a perspective view of a modified form of my bridge complete. Fig. IV is a top plan view of the same. Fig. V is a perspective view of one of the arch-plates detached.

Referring to the figures on the drawings, 1 indicates each of a series of arch-plates, whose number and whose breadth of span is determinable by the length and breadth of the bridge into which they are to be incorporated. In the completed structure they are assembled so as to rest upon a suitable base or foundation and are united, respectively, as to their adjacent edges, by suitable means. They may be composed of plain or, as illustrated, of corrugated sheet or plate metal, and by overlapping their adjacent edges they may be assembled to form a bridge. I prefer, however, in order to lend rigidity, strength, and durability to the structure, to unite their adjacent edges by intermediate binding members. Such members, which are in part placed between the adjacent edges of the arch-plates, which they support and hold in alinement, may be fashioned in a variety of ways. For example, they may be constructed, as illustrated at 2 in Figs. I and II, as arches of H-iron, in the opposite grooves 3 of which the edges of adjoining plates are inserted. The binding members are shaped to conform to the shape of the arch-plates, so as to constitute, when united with the arch-plates, a continuous arched tunnel, as shown, for example, in Fig. I.

In Figs. III and IV the binding members, there indicated by the reference-numeral 4, are made of T-iron, which construction I at present prefer as being equally serviceable and less expensive.

Upon opposite ends of the bridge I provide heads 5 and 6, which may be made of suitable sheet or plate metal. They may be united to the terminal arch-plates by suitable means—as, for example, by angular plates 7, either formed integrally with the arch-plates and bolted, riveted, or otherwise secured to the heads or formed separately and bolted, riveted, or otherwise secured to both the heads and the arch-plates.

In the completed structure various means for uniting the arch-plates to the binding members or to each other, if the binding members are omitted, may be employed. For instance, bolts or rivets 8 (see Figs. III and IV) may be employed for securing the plates to the supporting-flanges of the binding members, as illustrated, or, if the binding members are omitted, to one another.

In conjunction with the bolts or rivets directly securing the arch-plates to the binding members, or independently of them, straps 9, bolted or riveted, as indicated at 10, at their opposite ends to adjacent plates and spanning the intermediate binding member, may be employed. In some forms of embodiment of my invention, the bases of the binding members and the arch-plates being firmly united, it is not necessary to provide at frequent intervals connections between adjacent plates above their bases. In fact, it is sufficient to employ even a single tie-rod 11, stretching from one head to the other longitudinally across the apex of the arch.

An important feature of my invention consists in providing practicable means for successfully planting a bridge upon an earthen foundation without the employment of a specially-constructed foundation, as of masonry. To accomplish this object, I provide for the arch, composed of assembled arch-

plates and binding members, (if the latter are employed,) continuous horizontal bases 13. The bases may be formed simply and conveniently by bending the opposite ends of the arch-plates and the binding members, if employed, at required angles.

Upon the opposite ends of each of the arch-plates I provide one or more vertical lugs or tongues 14. The tongues 14 may be constructed in any suitable and preferred manner, my preference at present being to form them by slitting the metal of the bases of the arch-plates and turning them down to the vertical position, as clearly shown in Fig. V. In that figure the plate is shown as provided with one tongue 14 on each side; but, as above suggested, more may be employed if demanded, for instance, by the width of the arch-plate.

The tongues 14 serve as means of uniting to the arch a bottom or binding plate 15. The bottom plate 15 serves the purpose of uniting the ends of the arch-plates without the addition of other means for that purpose; but its specific object is to constitute a breast for the earthen foundation upon which the form of bridge at present under consideration is designed to rest. The bottom plate 15 should be of such width and in use sufficiently buried in the ground to completely protect and support the earthen foundation, preventing it from yielding under the weight imposed upon it or from being undermined by running water when the bridge is employed to span a stream, for example.

Although, as above stated, I prefer for some purposes the employment of a bridge provided with a horizontal base and vertical bottom plate, yet I contemplate the use of my bridge in connection with the ordinary foundation indicated at 17 in Figs. III and IV. In use in connection with such a foundation the bottom plate and the tongues 14, to which it is secured, may be omitted, the base 13 being secured to the foundation, as by bolts 18, built into the foundation, and nuts 19, screwing upon the ends thereof.

For maintaining the heads 5 and 6 securely in their vertical positions diagonal braces 20, secured at their opposite ends, respectively, to one of the heads and the base 13, may be employed.

I also illustrate a suitable form of rail, which consists of a guard-rail 21, supported as upon standards 22, the standards extending through apertures in the horizontal flange 23 on the head of the bridge and having their lower ends anchored in the earth which in practice covers the bridge. The rail 21 and the standards 22 may be made of cylindrical or tubular metal, for example.

I contemplate in connection with my invention the employment of wing-plates 25, which may be bolted, respectively, as indicated at 26, at one side to the opposite heads of the bridge, and which may be united, as by tie-rods 26^a, provided at their opposite ends with terminal bolts 27. By this means suitable and inexpensive supporting-walls at the opposite ends of the bridge may be supplied.

My bridge may be readily made available for crossing a stream diagonally, but upon a foundation which runs parallel with the stream, merely by cutting or otherwise shaping the terminal arch-plates diagonally, as clearly illustrated in Figs. III and IV of the drawings.

What I claim is—

1. A bridge composed of a series of metallic arch-plates and intermediate binding members united together, the intermediate binding members being in part situated between the edges of the arch-plates, which are supported and alined thereby substantially as set forth.

2. A bridge composed of a series of metallic arch-plates, intermediate binding members uniting the arch-plates, the intermediate binding members being in part situated between the edges of the arch-plates, which are supported and alined thereby and horizontal bases upon the opposite ends of the arch-plates, substantially as set forth.

3. A bridge composed of a series of metallic arch-plates, intermediate binding members uniting the arch-plates, the intermediate binding members being situated between the edges of the arch-plates, which are supported and alined thereby and horizontal bases upon the opposite ends of the arch-plates, formed by bending the material of the structure at a proper angle, substantially as set forth.

4. In a bridge, the combination with a series of arch-plates, of T-iron binding members interposed between and supporting the plates and having their supporting-flanges secured to the plates near their edges, substantially as set forth.

5. In a bridge, the combination with an arched member, and its bases, of a substantially vertical bottom plate, projecting from the arched member, and extending in the direction of the axis of the arch and adapted to afford a breast to retain an earthen foundation upon which the base is designed to rest.

6. In a bridge, the combination with an arched member and its bases, of vertical projections, or tongues upon the arched member, and a vertical bottom plate secured to the tongues, substantially as and for the purpose specified.

7. In a bridge, the combination with an arched member, formed of plate metal, and bases formed by bending the plate metal at a proper angle, of vertically-disposed tongues formed by slitting the ends of the arched member, and a vertical bottom plate secured to the tongues, substantially as set forth.

8. A section of bridge consisting of a sheet of metal having its ends bent to form bases at its opposite ends, and tongues formed by slitting the ends of the metallic sheet and bend-

ing them at an angle to the respective bases, substantially as set forth.

9. The combination of a bridge-head and flange, of standards passing through the apertures in the flange, and a rail supported by the standards, the lower ends of the standards adapted to be anchored in the earth, substantially as set forth.

10. The combination with a bridge and its heads, of wing-plates secured to the opposite ends, and tie-rods uniting the opposite wings, substantially as and for the purpose specified.

11. As a part of a bridge, wing-plates adapted to be secured to the heads of a bridge, and tie-rods connecting the wing-plates to hold them in position, substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

AARON G. PRATT.

Witnesses:
W. W. BRUNDAGE,
H. Y. ROSE,
LYMAN AULLS.