W. T. SHANNON.

METAL CULVERT.

APPLICATION FILED NOV. 11, 1912.

1,071,102.

Patented Aug. 26, 1913.

FIG. 1

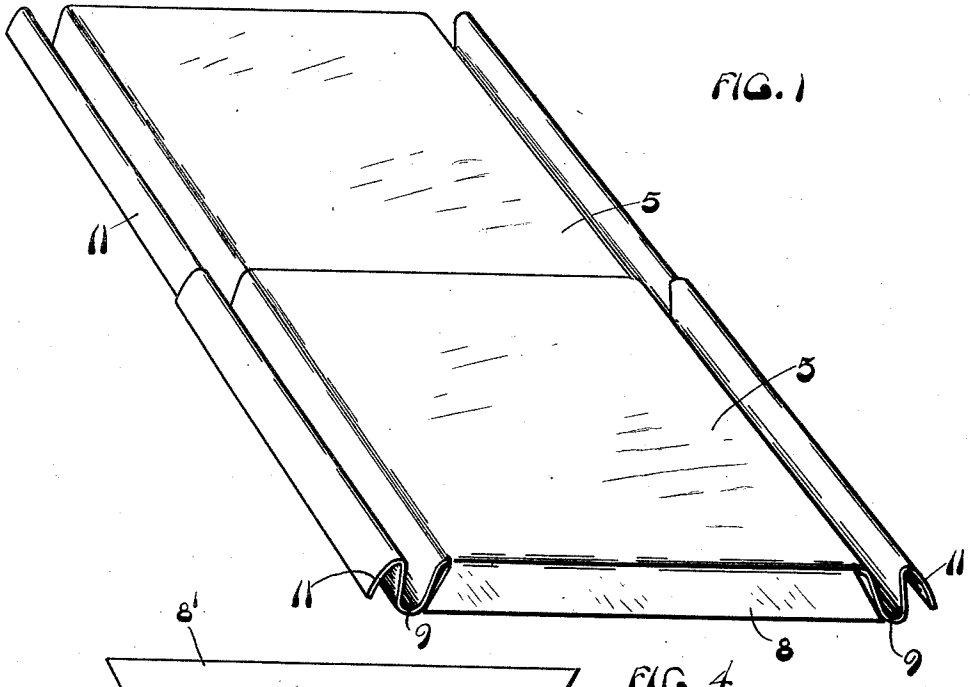


FIG. 4



FIG. 3

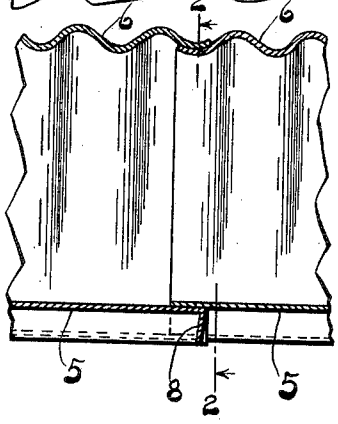
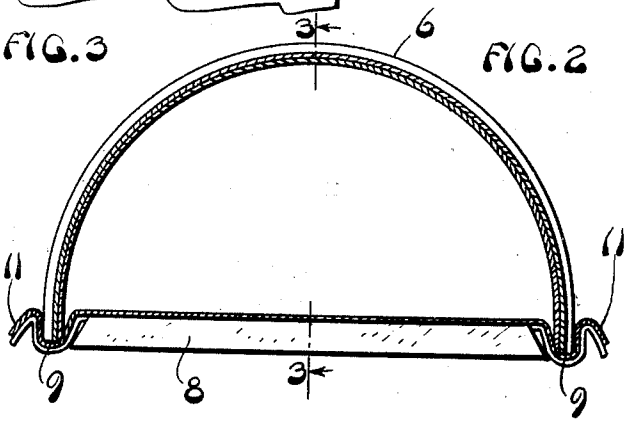


FIG. 2



Witnesses

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METAL CULVERT.

1,071,102. Specification of Letters Patent. Patented Aug. 26, 1913.

Application filed November 11, 1912. Serial No. 730,549.

To all whom it may concern:

Be it known that I, WILLIAM T. SHANNON, a citizen of the United States of America, and resident of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Metal Culverts, of which the following is a specification.

This invention relates to conduits and has for an object to produce an improved metallic conduit, capable of being effectively employed as a culvert, and in which means are provided for preventing an unobstructed flow of water under the culvert and the consequent washing or wearing away of the foundation or supporting earth below the culvert.

A further object is to produce a metal conduit section having a substantially flat bottom plate and provided with improved means for stiffening the bottom plate.

These and other objects I attain by means of a metallic structure embodying the features herein described, and illustrated in the drawings accompanying and forming a part of this application.

In the drawings Figure 1 is a perspective view of two bottom plates, embodying my invention, and it illustrates the relative positions they occupy in a culvert, and the means employed for securing them together. Fig. 2 is a transverse sectional view along the line 2—2 of Fig. 3 and illustrates a conduit embodying my invention. Fig. 3 is a fragmental sectional view along the line 3—3 of Fig. 2. Fig. 4 is a fragmental plan view of a sheet metal blank which may be employed in forming a bottom plate, embodying my invention, and illustrates a wedge-shaped tongue, which is preferably formed on the blank and is employed in the formation of a stiffening, and water deflecting and flow obstructing flange.

My present invention is illustrated in connection with a metallic conduit which is formed in separate sections and in which each section consists of a substantially flat bottom plate 5 and an arched cover plate 6, so arranged that the two parts of each section may be easily and quickly assembled and the separate sections may be easily and quickly secured together, without the necessity of employing rivets or other permanent fastening means.

Each plate 5 is formed from a sheet metal blank 7, such as is illustrated in Fig. 4, and is provided along one end with a strengthening and flow obstructing and deflecting flange 8, which is formed by bending a tongue 8′, formed on one edge of the blank, downwardly to a position substantially at a right angle to the flat portion of the blank. The tongue 8′ is preferably wedge-shaped, so that the lateral edges of the flange 8 are inclined outwardly from the top toward the bottom of the flange, for a purpose which will hereinafter be described.

Each bottom plate 5 is provided with longitudinally extending grooves 9, which are located along its lateral edges and are adapted to receive the lateral or straight edges of the curved cover plates 6. The cover plates 6, as illustrated, are corrugated and consequently the grooves 9 are shown of sufficient width to accommodate their corrugated edges. The bottom plates, illustrated, are also provided with down-turned flanges 11, which are located along the lateral edges of the plate, as shown and described in my Patent Number 1,040,442.

The inclined edges of the flange 8 of each plate engage, and to some extent support the ribs formed on the lower face of the plate by the formation of the grooves 9. To accomplish this it is necessary to bend the flange 8 backwardly, so that it does not extend exactly at right angles to the flat portion of the plate and so that its inclined edges are located back of the forward edges of the grooves 9. The inclination of the flange, caused by bending it to the position described, is slight, and is somewhat exaggerated in Fig. 3, for purpose of illustration. The formation of the flange 8 on each sheet metal plate stiffens the plate, and by employing the construction above described the flange 8 also operates to stiffen or support the ribs, formed by the formation of the grooves 9. While such a construction is preferred, it is not absolutely essential, and the tongue 8′ need not necessarily be wedge-shaped.

The flanges 8 are formed at one end only of the plates 5 and consequently, in assembling the plates to form a conduit, the flanged end of each plate is overlapped by the unflanged end of the next adjacent plate. The flanged ends of the plates are preferably turned toward the uphill end of the conduit when it is to be employed as a cul-

vert and the plates are so located, that the ribs on the bottom of the overlapping plates are forced into engagement with grooves 9 of the plates overlapped. With this construction each plate 5 is supported along its forward, or upper edge, by its flange 8 and along its lower edge by the flange 8 of the next adjacent plate. As illustrated, the lateral edges of each plate are supported by the ribs formed on the plate by the formation of the grooves 9, which extend downwardly below the flat portion of the plate, about the same amount as the flange 8. With this arrangement the flat portions of the plates are located above their supporting foundations or the supporting earth and the space below them, and between them and their support, is intersected at intervals by the transversely extending flanges 8. It is well known that water will flow along the line of least resistance and that, where the bottom plates of culverts of the class illustrated are mounted immediately upon the earth without the intervention of a rigid foundation, a stream of water is apt to be formed under the culvert, which, if it is unobstructed, will gradually undermine the culvert and eventually wreck it. The flanges 8 operate to obstruct and almost wholly prevent such a flow of water under the culvert or conduit and consequently prevent the foundation of the culvert from being washed or worn away. By turning the plate so that the flanges 8 are located along their upper edges, that is, toward the upper end of the culvert, the flanges will not only operate to obstruct a flow of water under the culvert, but they will also direct it into the culvert, through the crevices, or cracks, located between the overlapping plates. In addition to this the flanges 8 and the grooves 9 will be forced into the supporting earth, when the plates 5 rest upon the earth, without the intervention of a rigid foundation, and they will therefore operate to anchor each plate securely in place and more effectively prevent the eating away of the earth by a flow of water under the culvert.

After the bottom plates 5 are located in position, the cover plates 6 are mounted on them by inserting their straight edges into the grooves 9. The curved edges of the plates 6 preferably overlap, as illustrated in Fig. 3, and it is unnecessary to provide means for permanently securing them together.

An advantage of the construction herein illustrated is that the culvert or conduit may be formed of galvanized or protected sheet metal in which each plate, or section, is completely covered by the protective sheath or the galvanizing metal. Such a construction is impossible where the separate sections must be riveted or otherwise permanently locked together.

While I have illustrated a preferred embodiment of my invention, I desire to have it understood that various changes, modifications and substitutions may be made in the apparatus illustrated, without departing from the spirit and scope of my invention as set forth in the appended claims.

What I claim is:

1. A conduit composed of sheet metal sections, each section consisting of a cover and a substantially flat sheet metal bottom plate, provided along one end with an integrally formed, downwardly projecting, flange, and along its lateral edges with means for engaging the cover, said bottom plates being so located with relation to each other that the unflanged end of each plate is supported by and overlaps the flanged end of the next adjacent plate.

2. In a conduit section, a substantially flat bottom plate having supporting ridges formed on its under side, and located along its lateral edges, and a downwardly projecting transversely extending supporting flange located flush with one end of the plate.

3. In a conduit section, a separately formed bottom plate formed of sheet metal and having longitudinally extending supporting ribs formed on its lower face, and extending along its lateral edges, and a downwardly projecting flange extending across one end of the plate and located between the ribs.

4. A substantially flat bottom plate for conduits, comprising, a metal sheet bent to form longitudinally extending ribs on its under side and a downwardly projecting flange extending across one end thereof, the ends of said flange being in engagement with said ribs.

5. A conduit composed of sheet metal sections, each section consisting of an arched cover plate and a substantially flat bottom plate having longitudinally extending trough-shaped grooves formed near its lateral edges, and a downwardly projecting, transversely extending flange located at one end thereof, the unflanged end of each bottom plate in the conduit overlapping the flanged end of the next adjacent bottom plate, and the grooves of adjacent plates being forced into engagement with each other, and the arched plates being mounted on the bottom plates with their straight edges located in the grooves.

6. A culvert composed of separate sections, each section consisting of an arched sheet metal cover plate and a substantially flat sheet metal bottom plate, provided along one end with a downwardly projecting flange, and along its lateral edges with means for engaging the straight edges of a cover plate, said bottom plates being so located that the unflanged end of each plate is supported by, and overlaps the flanged

end of the next adjacent plate and the arched plates being mounted on the bottom plates.

7. A culvert composed of separate sections, each section consisting of an arched sheet metal cover plate and a substantially flat bottom plate having a downwardly projecting flow obstructing flange formed along one end thereof, said plates being so located that the flanged end of each plate is turned toward the upper end of the culvert and is overlapped by the unflanged end of an adjacent plate, and said arched cover plates being mounted on said bottom plates.

In testimony whereof, I have hereunto subscribed my name this 9th day of November, 1912.

WILLIAM T. SHANNON.

Witnesses:
E. W. McCallister,
W. Thornton Bogert.

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