

C. M. PORTER.
METAL CULVERT.
APPLICATION FILED DEC. 30, 1909.

971,558.

Patented Oct. 4, 1910.

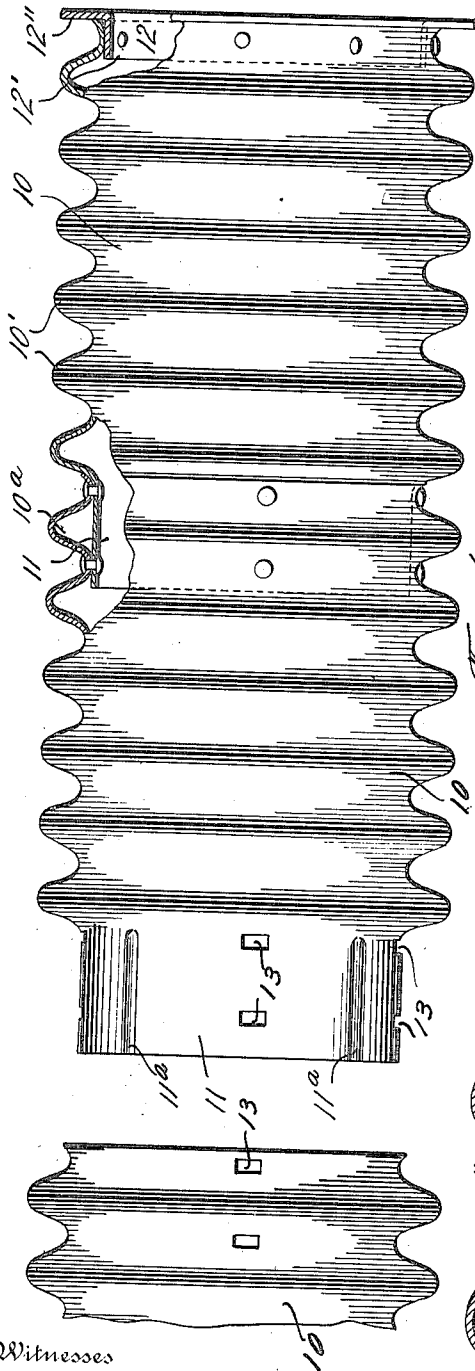


Fig. 1

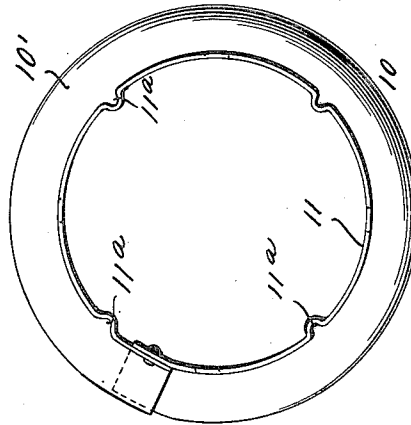


Fig. 2

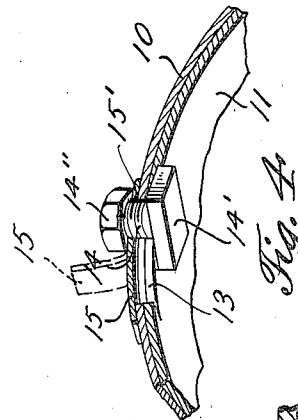


Fig. 4

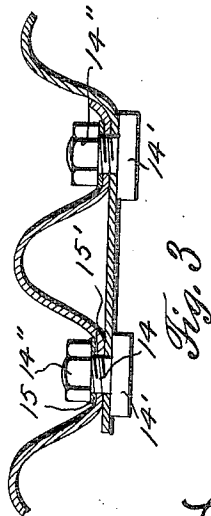


Fig. 3

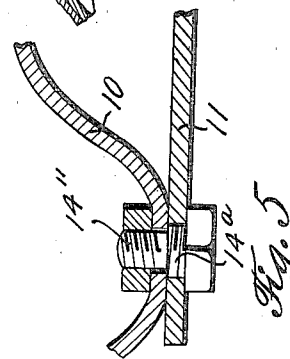


Fig. 5

Witnesses

E. Larson

M. J. Taylor

Inventor

C. M. Porter

By

Beale & Robb

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES M. PORTER, OF FARGO, NORTH DAKOTA.

METAL CULVERT.

971,558.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed December 30, 1909. Serial No. 535,547.

To all whom it may concern:

Be it known that I, CHARLES M. PORTER, a citizen of the United States, residing at Fargo, in the county of Cass and State of North Dakota, have invented certain new and useful Improvements in Metal Culverts, of which the following is a specification.

This invention relates to the construction of sheet metal culverts, and has for its object to construct a device of this character which shall be stronger and more convenient than similar devices heretofore generally used.

The invention consists of certain specific details of construction hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a culvert made in accordance with this invention, certain parts being broken away to better disclose the structure; Fig. 2 is an end view of one of the sections; Fig. 3 is a longitudinal sectional detail showing one of the means for securing adjacent sections together; Fig. 4 is a detail view indicating one of the connecting bolts; and Fig. 5 shows a slightly modified form of connecting means.

Throughout the following description and on the several figures of the drawing similar parts are referred to by like reference characters.

A culvert made in accordance with this invention comprises a series of tubular sections 10 connected together end to end, forming a device of any suitable length. Each of the sections is preferably corrugated circumferentially as indicated at 10' for the purpose of adding strength to resist crushing strains. At each of the joints between adjacent sections, one end 11 of each section is substantially cylindrical, not being corrugated as is the main portion of the section. Said cylindrical end 11 is inserted or telescoped into the adjacent end 10^a of the adjoining section, the latter mentioned end being corrugated throughout its length, the corrugated end thereof being disposed upon the aforesaid cylindrical end 11. The cylindrical end 11 is preferably long enough to receive a plurality of corrugations of the adjacent end 10^a, and any suitable fastening means such as rivets or bolts are employed for the purpose of uniting the two telescoped ends rigidly together, said fastening means passing through both of said ends and on

opposite sides of a ridge formed by the corrugation of the end 10^a. The construction embodying the combination of the corrugated end 10^a with the cylindrical end 11 constitutes a peculiarly rigid trussed structure. The aforesaid cylindrical end 11 may be longitudinally crimped at several places as indicated at 11^a if desired for the purpose of convenience in assemblage and to provide for expansion of the structure during freezing weather. Each of the sections 10 is preferably constructed of a unitary sheet of metal which may be of any suitable nature and galvanized if desired. The said sheet of metal is bent upon itself into tubular form and the edges thereof may be overlapped and connected in any convenient manner well understood in the art.

At each end of the finished culvert there is preferably provided a flanged collar 12 for the purpose of giving additional strength to that portion of the culvert which is necessarily exposed. The collar comprises an inwardly projecting flange 12' which is connected in any suitable manner permanently to the adjacent corrugated end of the culvert section, and it also includes an outwardly extending flange 12''.

Culverts of the character described herein are made at the factory in different sizes according to the various requirements of the trade and several of the sections may be united while in the factory. Various orders for long culverts are usually filled by providing a plurality of lengths of sections which are shipped and intended to be connected at the place where the culvert is to be installed. For convenience of assemblage the adjacent ends of the sections to be connected are preferably provided with special attaching means, whereby it is not necessary for the builders or operators to enter into the interior of the culvert in order to assemble the same, this being especially desirable in cases of culverts of such small diameter as to make it practically prohibitive for a person to enter the same. As indicated in Figs. 3 and 4 the adjacent section ends to be connected are shown as being provided with oblong holes or slots 13, the longer axis of each of said slots being preferably circumferential. The special fastening means comprise bolts 14 each of which has a head 14' corresponding in shape to said slots though sufficiently smaller to permit the free passage of said head through the aligned slots, which

may be done from the outside, and then the bolt is turned through an angle of 90° and moved bodily toward one end of the slot where it may be held temporarily by the introduction of a punch or other tool into or through the then open end of the slot, the lower end of the tool being forced firmly against the inner face of the bolt head. While being held in this position temporarily the nut 14'' will be applied to the outer end of the bolt. If desired to more completely close the opening formed in the manner above indicated a washer 15 having a hole 15' in one end may be placed over the bolt between the nut and the corrugated end 10^a. The washer is preferably made with one end upturned in order to permit the use of the tool above described, and after the nut is turned home said upturned end of the washer may be straightened or pounded down over the open end of the slot.

The modification illustrated in Fig. 5 is one in which the fastening bolt 14^a is permanently connected to the inner section in any convenient manner, as by screw threads, preferably left handed. The outer end of the bolt should be threaded with an opposite character of thread and after the outer section is slipped or sprung into place over said outer end the nut 14'' may be driven home by an ordinary wrench completing the connection. Since the threads of the bolt are of opposite characters turning of the nut cannot loosen the bolt from the inner section. This form of connecting devices is adapted especially for sections of comparatively large diameters, and in view of the fact that structures of this character are not required to be snugly fitted and the further fact that the inner member is corrugated to enable it to be sprung or distorted to a certain extent, no practical difficulty is found in assembling these parts in the manner above described.

Having thus described the preferred embodiment of the invention, without desiring to be limited thereto except as may be re-

quired by the state of the art, what I claim as new is:

1. The hereindescribed sheet metal culvert comprising a plurality of tubular corrugated sections, a flanged reinforcing collar connected to the end section, the ends of adjacent sections being telescoped, the inner end being cylindrical where received within the corrugated end of the adjoining section, and fastening devices passed through said adjacent ends, substantially as set forth.

2. In a sheet metal culvert of the character set forth, the combination with a plurality of tubular sections, the adjacent ends of which are telescoped each to each, the main portion of each section being circumferentially corrugated throughout its length but for that portion which is telescoped within the next section which said portion is substantially cylindrical, and fastening devices in pairs passed through the telescoped ends and securely fastening a corrugated portion of one section to the cylindrical portion of the other section and constituting a rigid truss connection.

3. In a sheet metal culvert, the combination of a plurality of tubular sections, each of said sections being corrugated circumferentially from one end throughout its length to a point closely remote from the opposite end and thence cylindrical, the corrugated end of the next section being telescoped upon the cylindrical end of the preceding section, the cylindrical end of each section being longitudinally crimped, and fastening devices in pairs passed through the telescoped adjacent corrugated and cylindrical end portions of adjacent sections, said fastening devices being operable from the outside of the structure, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES M. PORTER.

Witnesses:

F. H. BEACH,
S. B. PORTER.