No. 735,533. PATENTED AUG. 4, 1903.

L. LANE.

CONDUIT OR CULVERT.

APPLICATION FILED NOV. 19, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

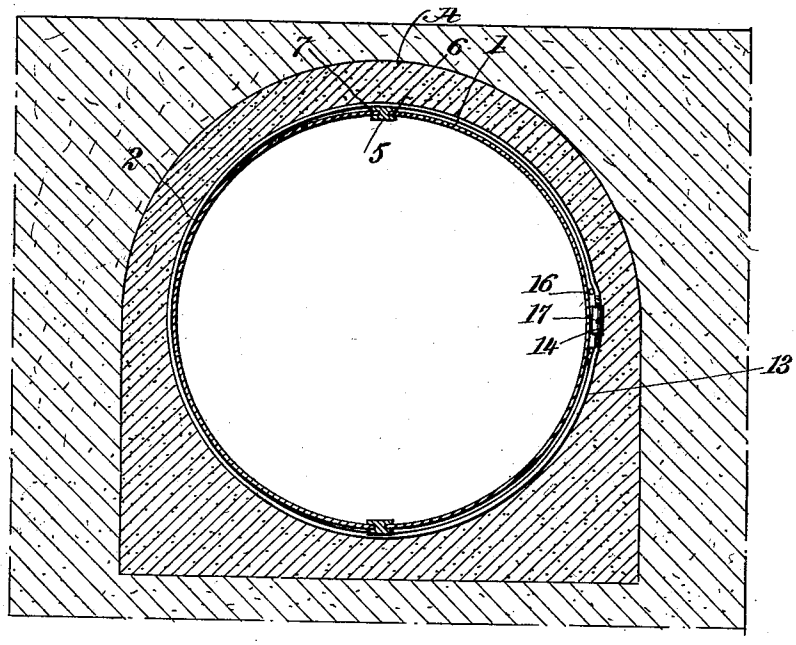

Fig. 1

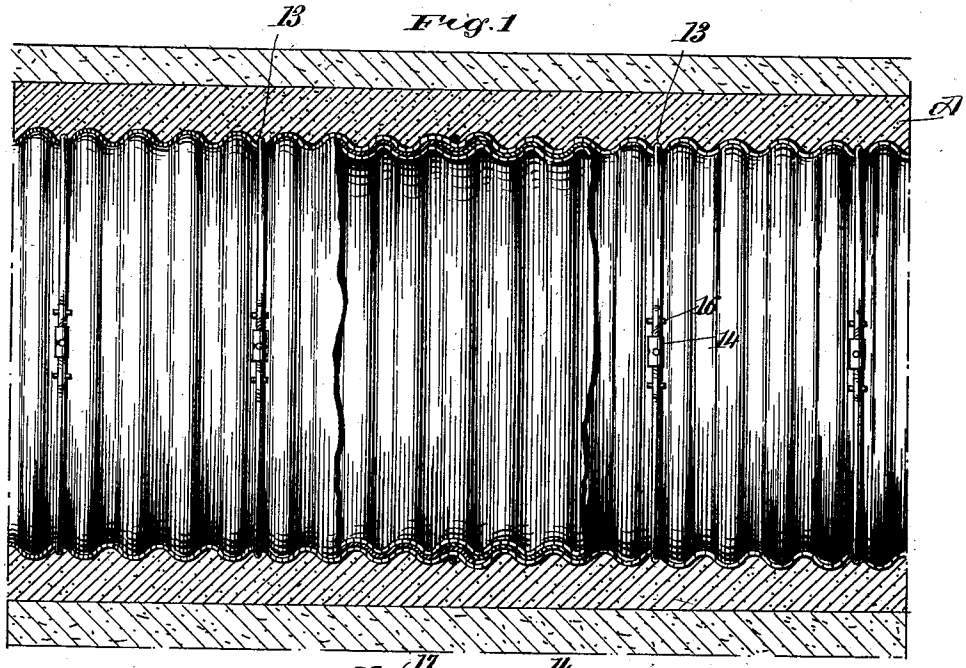

Fig. 2

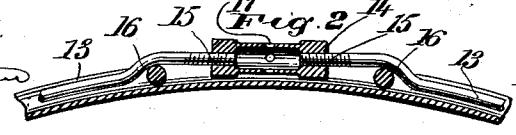

Fig. 3

WITNESSES:

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NO MODEL. 2 SHEETS—SHEET 2.

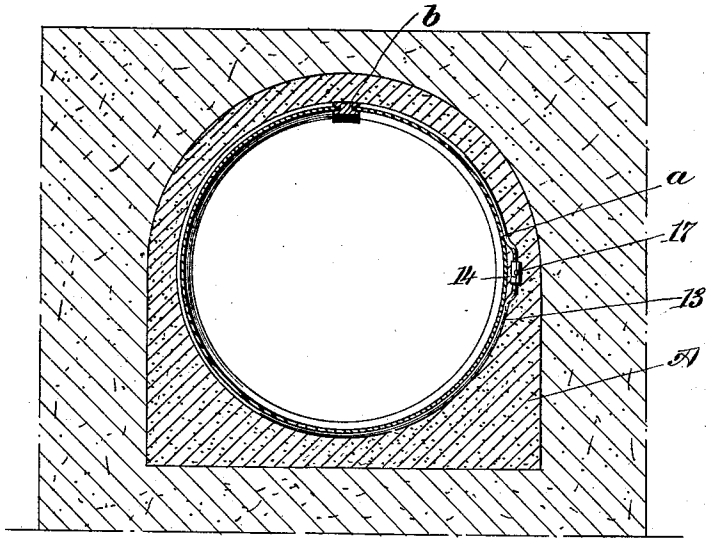

Fig. 4

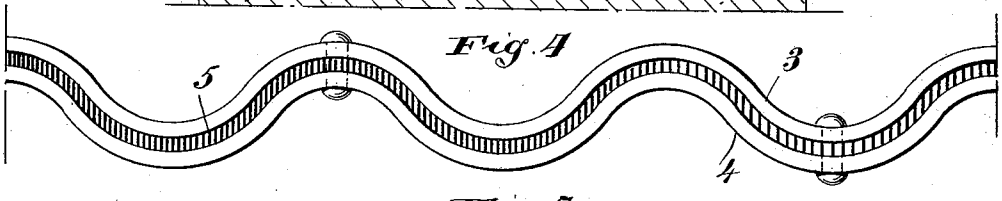

Fig. 5

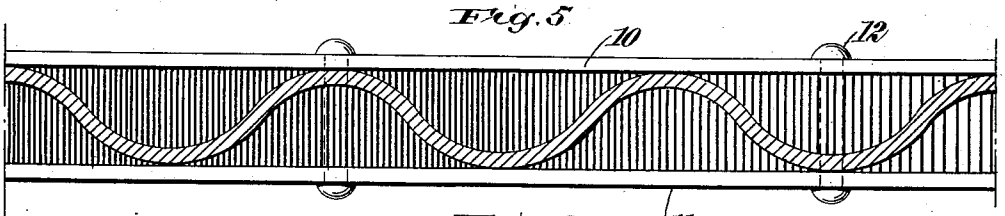

Fig. 6

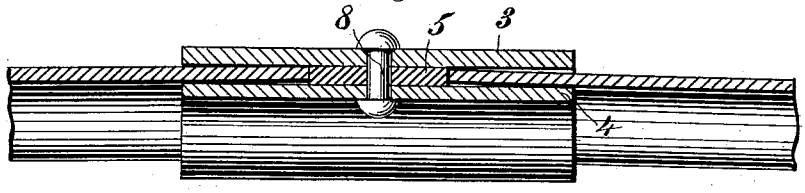

Fig. 7

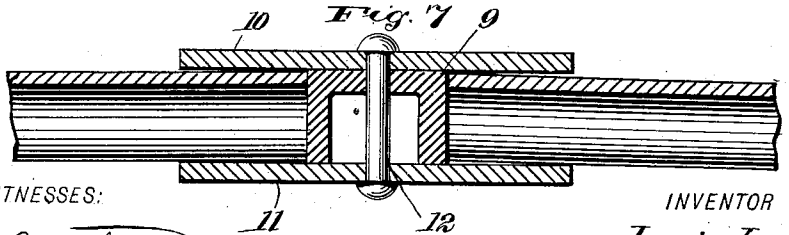

Fig. 8

WITNESSES:

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No. 735,533. Patented August 4, 1903.

UNITED STATES PATENT OFFICE.

LOUIS LANE, OF TOLEDO, OHIO, ASSIGNOR TO THE AMERICAN ARCH AND CULVERT COMPANY, OF TOLEDO, OHIO.

CONDUIT OR CULVERT.

SPECIFICATION forming part of Letters Patent No. 735,533, dated August 4, 1903.

Application filed November 19, 1902. Serial No. 131,968. (No model.)

To all whom it may concern:

Be it known that I, LOUIS LANE, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Conduits or Culverts, of which the following is a full, clear, and exact description.

My invention relates to certain new and useful improvements in the construction of small conduits, culverts, aqueducts, or the like.

In carrying out my invention I have particularly in contemplation a structure of the character described, the parts of which may be readily shipped from point to point in sections or detached portions and may be quickly and easily assembled and bound or held in such assembled position through the medium of the improved devices to be hereinafter described.

Heretofore in the art to which my improvement appertains it has been difficult to construct or form a conduit, culvert, or aqueduct of any considerable size of metal tubing or piping or of sections of the same because in such instances it was customary to unite the sectional circular sheets of metal through the medium of small rivets, bolts, studs, or similar devices, and as such sections of metal were naturally very thin and as the bearing-surface of the rivet or stud was very small it was necessary to employ a great many of such bolts or rivets to form an approximately circular duct, with the result that the apertures punched or drilled into the body of the metal greatly weakened the same and when such metal was subjected to the action of water or the ordinary wear and tear upon the conduit it soon rusted and became useless. For this reason conduits constructed of such sectional arches or sheets of metal have not been put into general use.

It is therefore the object of my invention to overcome the objections above mentioned by providing a suitable joint or binding means which shall firmly unite the sectors going to make up the culvert or conduit without the necessity of puncturing or perforating the metal thereof to any great extent.

A further object of the invention is to provide adjustable binding hoops or bands for tensioning and assisting in retaining the sections in position after they have been assembled.

A further object of the invention is to provide a conduit or culvert of the type described which shall be exceedingly simple in construction, durable, and capable of being readily assembled, while embodying the essential feature of inexpensiveness.

With these ends and others of a similar nature in view my invention consists in the peculiar construction, combination, and arrangement of parts as will be hereinafter described in the specification, illustrated in the drawings, and set forth in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a central vertical sectional view taken through a conduit or culvert embodying my improvement. Fig. 2 is a longitudinal view of the same, a portion of the metal section of the conduit being illustrated in section to show the arrangement of the binding strip or bar. Fig. 3 is a detail view, partly in section, showing the arrangement of the turnbuckle or key for retaining the ends of the clamping-band. Fig. 4 is a vertical sectional view of another form of conduit embodying my improvement. Fig. 5 is an enlarged detail view of one form of my improved binding-strip. Fig. 6 is a view similar to Fig. 5, showing another form of my improved strip. Fig. 7 is a transverse vertical sectional view taken through a portion of the conduit and showing the arrangement of the binding-strip when in position, and Fig. 8 is a similar view showing the application of a strip of the character shown in Fig. 6.

Referring now to the drawings in detail, A designates a filling or casing, of cement or like material, adapted to surround the metal portion of my improved conduit when the sectors or sections thereof are united and assembled in position.

As will be seen by reference to the drawings, particularly to Figs. 1 and 2, this metallic body or portion of the conduit is composed of the sections 1 and 2, shown in the

present instance approximately semicircular in conformation and preferably circumferentially corrugated, so that when the two sections are assembled in their united operative position a tube or duct substantially circular in cross-section is formed. For the purpose of uniting these simicircular sections instead of overlapping and riveting the ends together, as has heretofore been the practice, I employ a binding-strip extending longitudinally of the body of the duct and adapted to retain the lengthwise adjacent edges in such manner that it shall be impossible for the same to be disrupted or forced apart. The structure of this binding-strip is clearly shown in Figs. 5, 6, 7, and 8, and the manner of applying the same is also delineated in Figs. 1 and 2. The bars, composed of the two strips 3 and 4, extending substantially parallel, are held spaced apart by a reduced portion or block 5, which may be formed integral with the strips or may be in the shape of an interposed section. This longitudinal binding-bar is adapted to have the edges of the duct-sections, as at 6 and 7, lie between the spaced parallel strips and preferably abut against the opposite sides of the block 5. A stud, bolt, or rivet, as at 8, passes through the top strip, the interposed block and the lower strip uniting the portions firmly and securely. When the duct or conduit is formed of semicircular sections, as shown in Figs. 1 and 2, two of these binding-bars are employed. In fact, as many of such bars are used as are necessary to unite the contiguous or adjacent edges of sections. In Fig. 4 it will be seen that the tubular section, as at *a*, is formed of one piece of metal, the longitudinal edges of which are united by the binding-bar *b*, and a structure of this character is especially adapted for use when a conduit of small diameter is desired.

When the transverse corrugations or crimps of the metallic conduit-sections are sufficiently deep to warrant it, instead of employing a corrugated binding-bar of the character shown in Fig. 5 I have devised a structure such as shown in Figs. 6 and 8, wherein it will be seen that a block, as at 9, is substantially equal in height to the depth of the corrugations and is inserted between the longitudinal edges of the sections in such manner that they bear against the sides thereof, and two strips 10 and 11 are placed above and below the said block 9 and united thereto and to the beam by a bolt or rivet 12. This permits the binding-strip employed to be a perfectly flat one.

After the conduit-sections have been united and the binding-bars have been placed in position the whole structure will be bound firmly together through the medium of the encircling bands or rings 13, which lie, preferably, within the corrugations and may be tightened or loosened through the medium of a suitable turnbuckle or key 14, adapted to receive at its ends the screw-threaded extremities 15 15, said portions being slightly bent upward and outward, so as to obviate any binding upon the circumference of the duct-sections which would prevent the turning of the said buckle, and to further assist in holding the key or buckle slightly away from the surface of the duct small pins or blocks 16 are inserted between the shouldered portions of the binding-band 13 and the surface of the conduit. The said turning key or buckle is provided with a number of suitable apertures, as at 17, adapted to receive a suitable rod or bar, affording a purchase on said buckle when it is desired to rotate or turn the same in tightening or loosening the bands.

From the above description the manner of constructing my improved conduit will be readily apparent. The sections may be placed in their operative position, the longitudinal retaining-bars applied thereto, as hereinbefore described, and the binding-bands or clamping-rings secured in place. A filling of concrete or other like material, as shown at A, is then built around the metallic conduit in the ordinary manner.

It will further be evident that there are numerous advantages other than those herein recited incident to my improved conduit or culvert. The metallic sections forming the same may be readily shipped from place to place, carried very conveniently, at the same time effecting a great saving in freight or shipping charges, and the sectional feature enables the conduit or culvert to be used in a great many localities where it would be impossible to transport the huge cumbersome ducts or conduits heretofore employed. There are also so many advantages incident to my improved structure that it is unnecessary to dwell upon the same in detail.

Although I have shown and herein described a preferred form of my improvement, it will of course be evident that there may be modifications and variations in some respects with regard to details without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A conduit or culvert comprising a series of sections, longitudinally-extended means uniting said sections, and adjustable binding means extending transversely of the conduit, substantially as set forth.

2. A conduit or culvert comprising a series of corrugated metallic sections or sheets, means for securing the adjacent longitudinal edges of said sheets or sections, binding-bands or rings extending transversely around the corrugated conduit, and a turnbuckle uniting the ends of said binding-bands, whereby the tension of said bands upon the conduit can be tightened or loosened, substantially as set forth.

3. An improved conduit or culvert, comprising united metallic sections, means ex-

tending longitudinally of the sections for holding the same in such united position, transverse binding means, and a casing of concrete or similar material surrounding said conduit, substantially as set forth.

4. A conduit comprising metallic sections united to form a duct, longitudinally-extending key-bars sustaining the sections in said united position, transversely-extending binding-bands encircling the duct, and a concrete casing or ring surrounding said duct, substantially as set forth.

5. A conduit, comprising a duct formed of metallic sections, a binding-bar for holding said sections in their assembled position, a clamping-band encircling said assembled sections, the ends of said band being bent outwardly away from the body of the duct, a turnbuckle adjustably uniting said ends, and a concrete casing for said duct, substantially as set forth.

6. A conduit having a sheet-metal duct-section bent into an approximately cylindrical form, a binding-bar uniting the adjacent longitudinal edges of said duct-section, and clamping means extending circumferentially of the duct-section, substantially as set forth.

7. The combination of a conduit or culvert, binding means extending longitudinally of the same, clamping means surrounding the conduit and longitudinal binding means, means for adjusting the clamping means, and a concrete casing for said conduit, substantially as described.

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

LOUIS LANE.

Witnesses:
EARLE WHITTON,
ROY G. LANE.