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PATENTED SEPT. 1, 1908.

J. H. SCHLAFLY.  
CULVERT AND CONNECTION.  
APPLICATION FILED APR. 23, 1908.

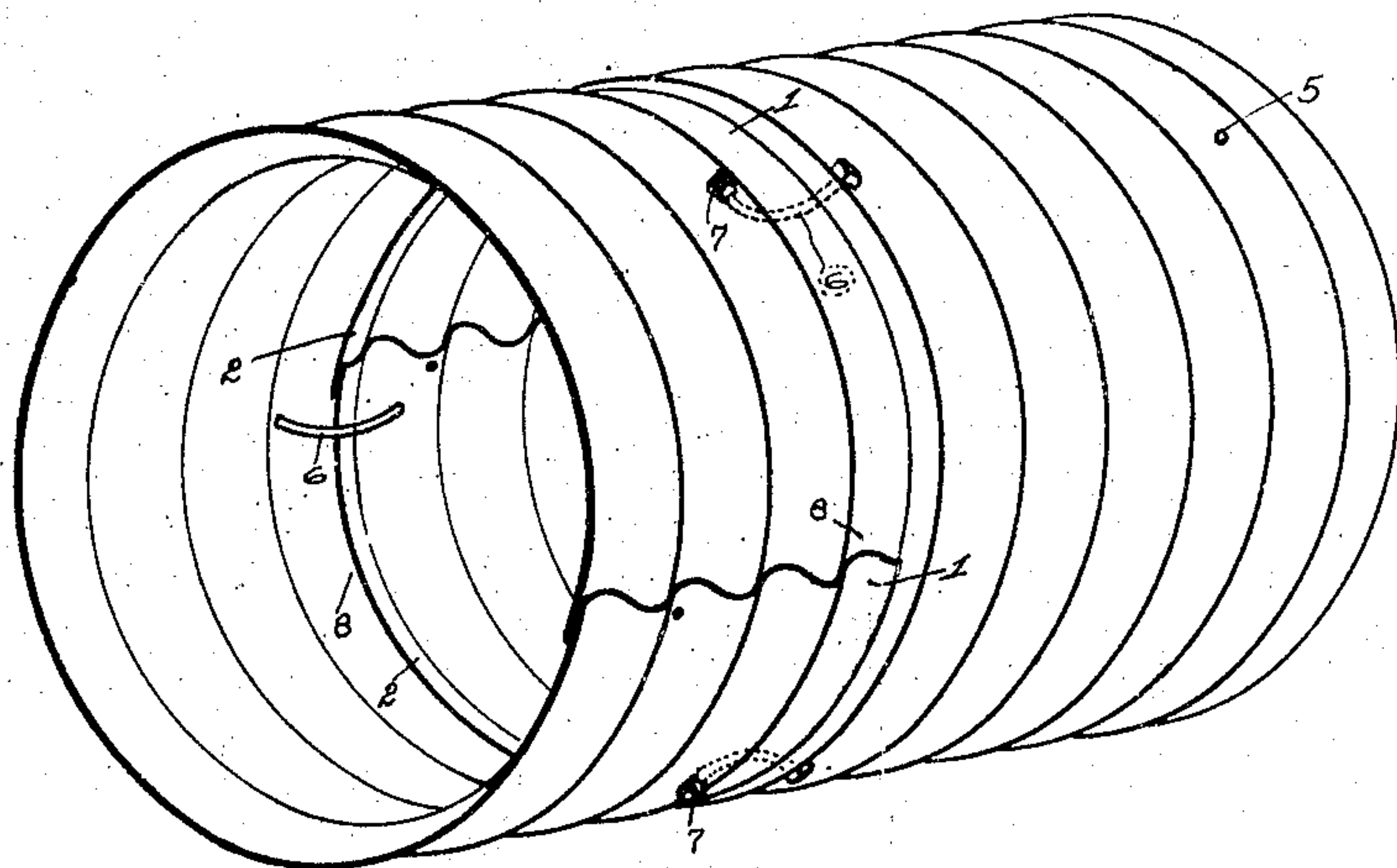


Fig. 1.

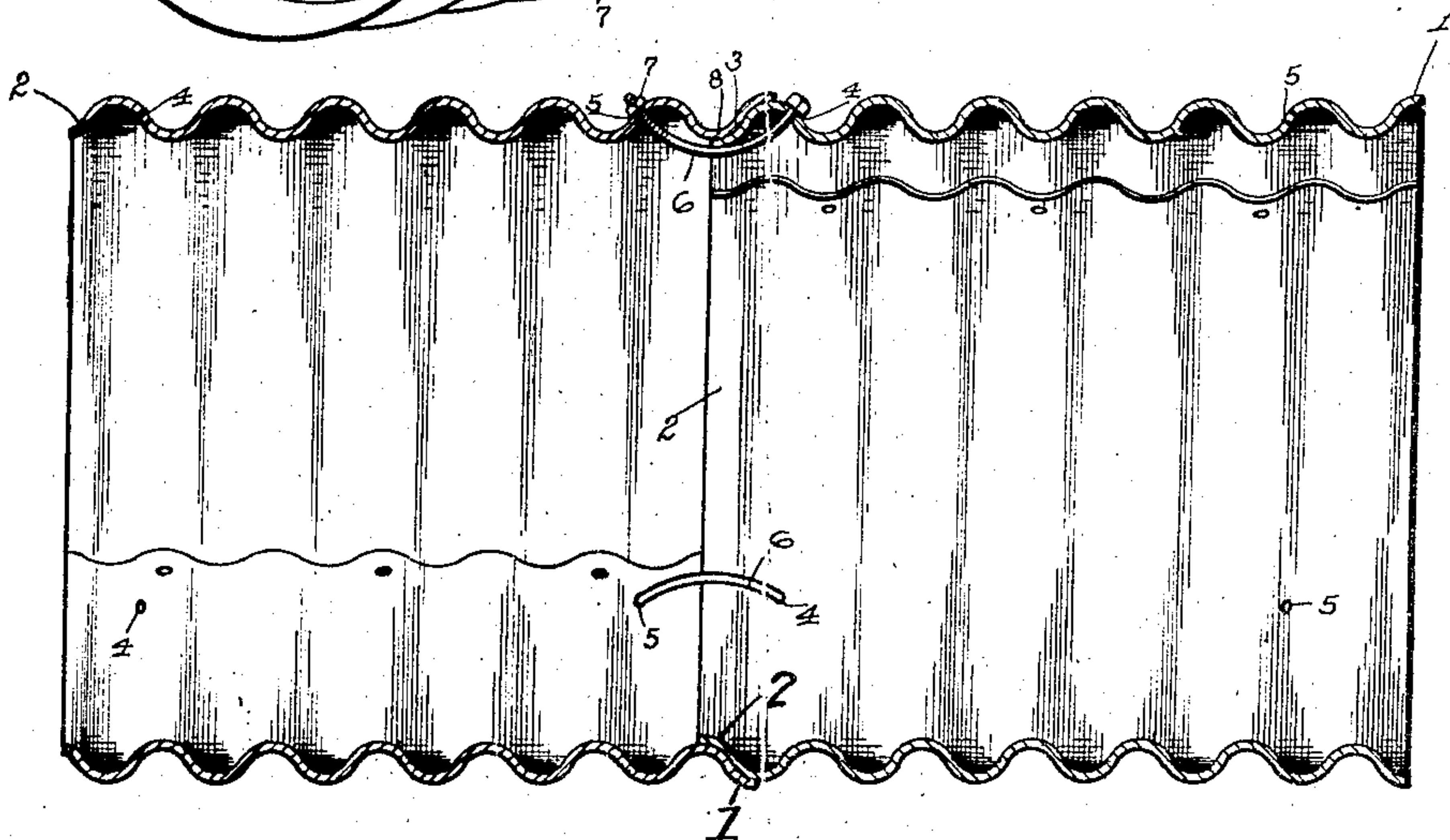


Fig. 2.

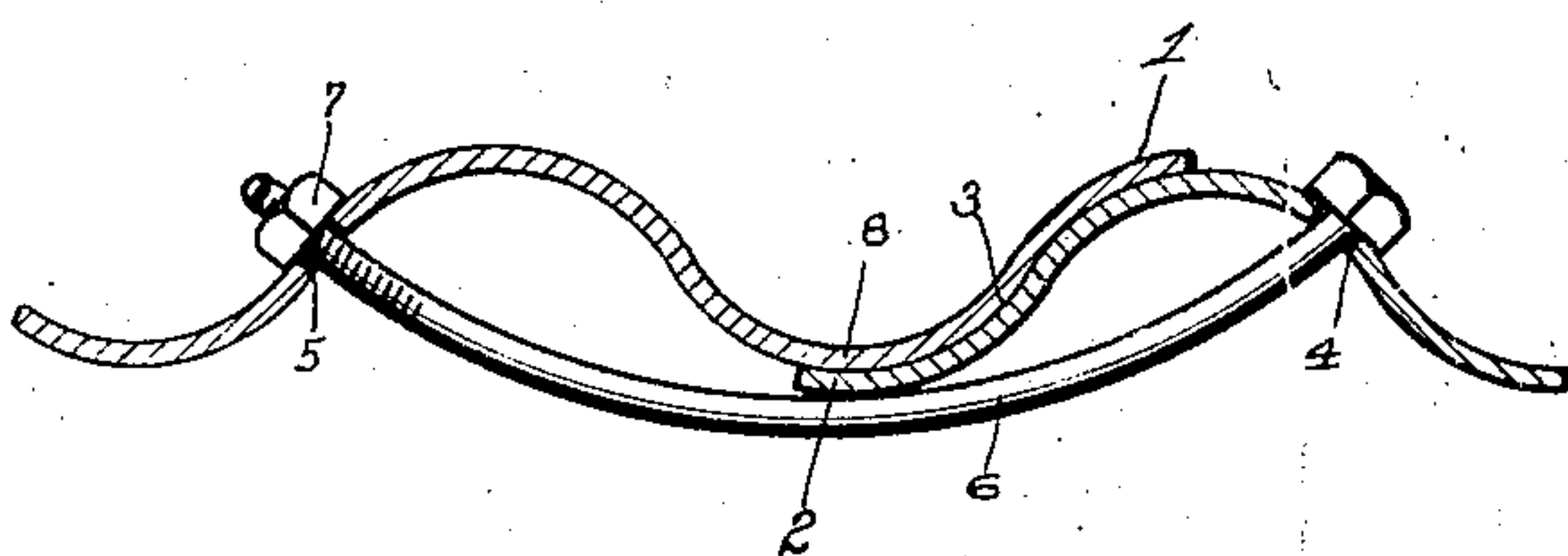


Fig. 3.

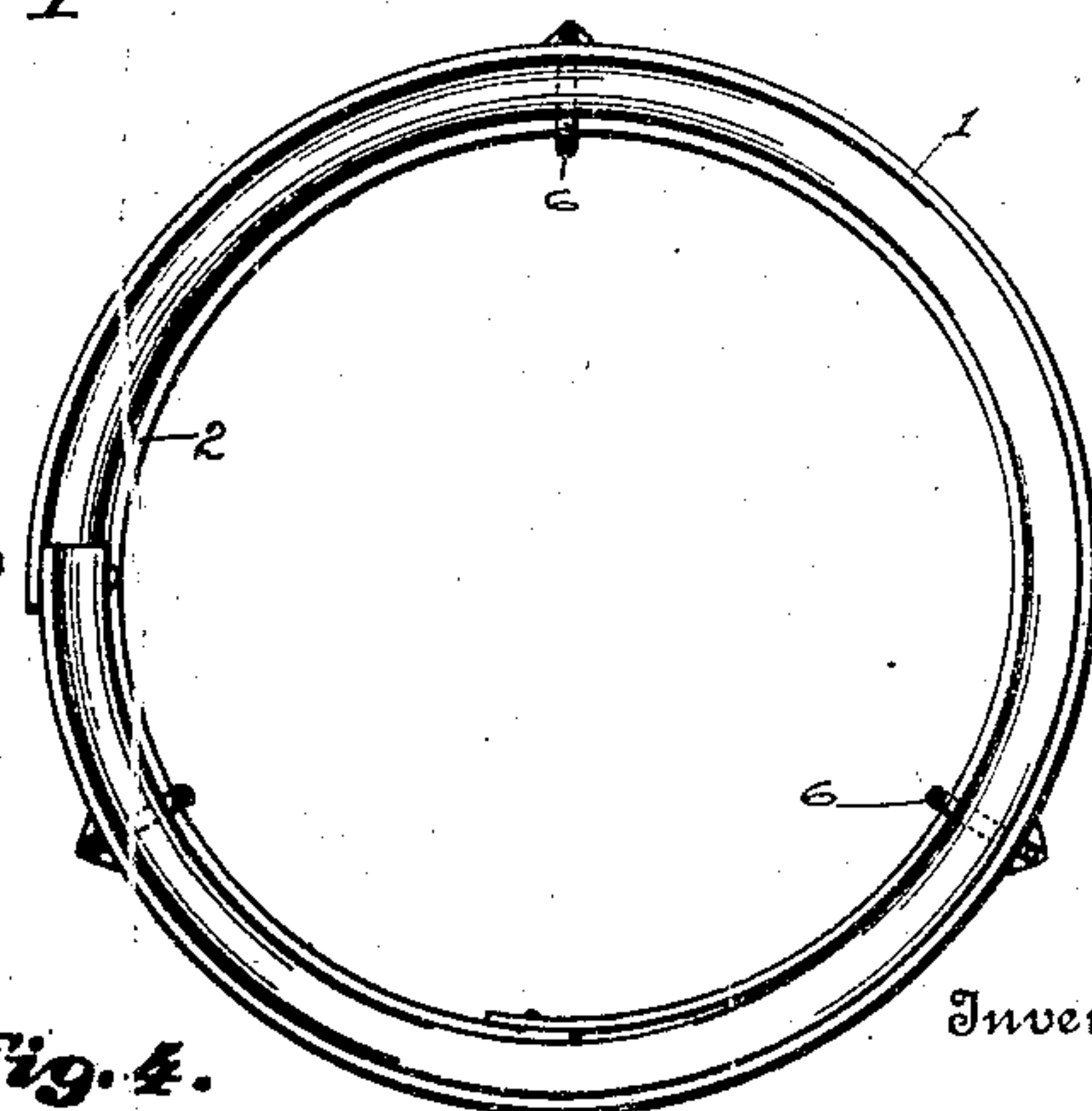


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## CULVERT AND CONNECTION.

No. 897,416.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed April 23, 1908. Serial No. 428,737.

*To all whom it may concern:*

Be it known that I, JULIUS H. SCHLAFLY, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Culvert and Connection, of which the following is a specification.

In the manufacture, handling, connection and placing of culverts or large pipes to be used as drains, aqueducts or the like, it has been found practical as well as convenient and economical to use sheet metal in the construction and to make the culverts in sections so that they may be more readily handled and transported and a culvert of any desired length constructed by connecting an appropriate number of said sections. The sheet metal from which the sections are made may be corrugated or plain, but in either case the means of connecting the sections to each other is of great importance and several such means have heretofore been suggested.

My invention relates to improvements in culverts and connections, in which culvert sections are fastened together or united end to end by means of curved bolts acting in conjunction with the peculiar conformation of structure hereinafter disclosed; and the objects of my improvement are; first, to provide a culvert in which the various sections may be easily and conveniently connected together; second, to afford means not only for fastening the sections, but also for drawing the sections together in such way as to make a tight joint; third, to provide means of connecting as stated without producing any projection on the inside of the culvert which will be liable to form an obstacle for the free passage of sticks, dead grass, leaves or other refuse or rubbish, such as is liable to be washed through ordinary road culverts; fourth, to provide a connection for sectional culverts, which will have few parts and in the use of which few and simple tools and slight mechanical skill are required. I attain these objects by the construction and arrangement of parts hereinafter disclosed and illustrated in the accompanying drawing, in which—

Figure 1 is a perspective view of two connected sections of culvert embodying my improvement. Fig. 2 is a longitudinal sectional view of two connected sections. Fig. 3 is a

detached sectional view of that portion of the culvert sections forming the joint and illustrating in a larger scale the arrangement and operation of the bolt. Fig. 4 is an end view through two connected sections of the culvert.

Similar numerals refer to similar parts throughout the several views.

As before stated the sections may be made of corrugated or plain sheet metal. If they are made of plain sheets it is necessary to form one or two corrugations at the end of each section in order to make the connection herein described, but the preferable method is to corrugate the metal sheets for their full length and when the said sheets are then bent into circular form and fastened in the construction of the sections, annular corrugations are produced extending entirely around the sections as shown in the drawing. This not only produces a stronger section, but also makes it very convenient if it is desired to cut off a portion of the section in order to produce a culvert of a required length.

In the construction of the sections the corrugations are so located and arranged that at one end the section is completed at the point of greatest diameter 1, while the other end of the section is completed at the point of least diameter 2. It will be understood that the compound curves of the convex and concave surfaces of the corrugations are so regular that the contracted end 2 of a section may readily be introduced into the flaring end 1 of the next section and the external surface of the one section when pressed against the inner surface of the other section will produce a tight joint along the engaging surface as at 3, and it will be understood that the more tightly the end 2 is pressed or drawn into the end 1, the better will be the joint produced. Upon the convex corrugation nearest the contracted end 2 of each section are located a plurality of holes 4, the usual number of these holes for culverts of ordinary size being three or four, which are located at points equi-distant from each other about the circumference of the section and on the side of said convex corrugation away from the end 2. Upon the first complete convex corrugation at the other end of each section are located the holes 5 equi-distant from each other about the circumference and to correspond with the holes 4



just described. The holes 5 are located upon the side of the said convex corrugation away from the end 1 as shown in the drawing.

In joining the sections the contracted end 2 of one section is introduced into the flared end 1 of the adjacent section and the two sections rotated with reference to each other, until the holes 4 and 5 are brought opposite each other. The curved bolts 6 are then introduced through the holes 4 and their threaded ends caused to project through the holes 5. The nuts 7 are then drawn up upon the said threaded ends and produce a drawing effect between the two sections, causing the contracted end of the one section to press tightly into the flared end of the adjacent section. The drawing effect upon the said bolt also tends to reduce its curvature and in the reduction of its said curvature it presses tightly against the end 2 and causes it to bind tightly against the concave portion 8 of the first corrugation of the adjacent section.

When all of the curved bolts have been properly drawn up a tight joint between the sections is produced, the edges of the ends 2 are pressed firmly in place the surfaces of the contracted and flared ends are pressed tightly together, and a very strong joint or connection is produced. Because of the formation of the corrugations, and the well known additional strength thereby produced and because of the location of the holes, and the arrangement of the curved bolt with reference to the corrugations, the sections are not only tightly pressed or drawn together for the purpose of a tight joint, but the connection is one of great strength and a culvert composed of several sections, and of considerable length, thus coupled together will possess great rigidity and will successfully resist any ordinary force, which would tend to displace or disconnect the said sections. Furthermore it will be understood that by the use of the curved bolts it is unnecessary to enter the culvert or to reach inside of it for the purpose of applying this improved connection, for the bolts may readily be introduced through the hole 4, and the threaded end brought out through the hole 5 the work being done entirely from the outside. In placing the culvert, it is advisable to turn the contracted ends 2 in the direction of the flow of the water and the culvert and connection will be well adapted to be kept clear of obstructions.

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

1. The herein described culvert and connection comprising culvert sections corrugated at the ends, one end of each section terminating at the point of greatest diameter, producing a flared end and the other end terminating at the point of least diameter producing a contracted end, holes arranged

in the sides of the first and last full convex corrugation at each end of the sections, the contracted end of one section introduced into the flared end of the other section, curved bolts extending through the said holes in the sides of the corrugations and the said bolts provided with nuts whereby the sections may be drawn together and a tight joint produced between the flaring and the contracted ends, substantially as specified.

2. In a culvert and connection, culvert sections each provided with a flaring and a contracted end, the external surface of said contracted end corresponding in contour with the internal surface of the flaring end, full convex corrugations adjacent to said ends, holes in the sides of said full convex corrugations farthest from the engaging ends of the said sections, the contracted end of one section introduced into and engaging the flared end of the adjacent section, curved bolts through the holes in said sections and nuts on the said bolts for the purpose of drawing the sections together, substantially as and for the purpose specified.

3. In a culvert and connection, culvert sections each provided with a flaring and a contracted end, the external surface of said contracted end corresponding in contour with the internal surface of the flaring end, full convex corrugations adjacent to said ends, holes in the sides of said full convex corrugations farthest from the engaging ends of the said sections, the contracted end of one section introduced into and engaging the flared end of the adjacent section, curved bolts through the holes in the said sections, the said bolts bearing against the contracted edge on the inside of the joint, and nuts on the said bolts for the purpose of drawing the sections together, and of pressing the said contracted end of the inner section against the flared end of the outer section, substantially as and for the purpose specified.

4. In a culvert and connection, the combination of circumferentially corrugated sections, each section terminating at one end at a point of greatest convex corrugation and at the other end at a point of greatest concave corrugation, the contracted end of one section located in the flared end of the adjacent section and means for drawing the two sections together, substantially as and for the purpose specified.

5. In a culvert and connection, the combination of culvert sections each provided with a flared and a contracted end, a full convex circumferential corrugation located upon each end of each section adjacent to the flaring and to the contracted portions respectively, a contracted end of one section located within the flared end of the adjacent section, holes located in the sides of the said corrugations and means located through said holes and in engagement with the said



corrugations adapted to draw the said sections together, substantially as and for the purpose specified.

6. In a culvert and connection, the combination of culvert sections, each section provided with a flared and a contracted end, the contracted end of one section adapted to enter the flared end of an adjacent section, the outer surface of the contracted end and the inner surface of the flared end being adapted to closely engage each other and means for

drawing the sections together longitudinally, whereby a tight joint may be formed between said engaging surfaces, substantially as specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

JULIUS H. SCHLAFLY.

Witnesses:

CHAS. W. KRIEG,  
A. D. McQUEEN.