No. 746,112. PATENTED DEC. 8, 1903.

A. LAURIDTZEN.

CULVERT.

APPLICATION FILED APR. 18, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

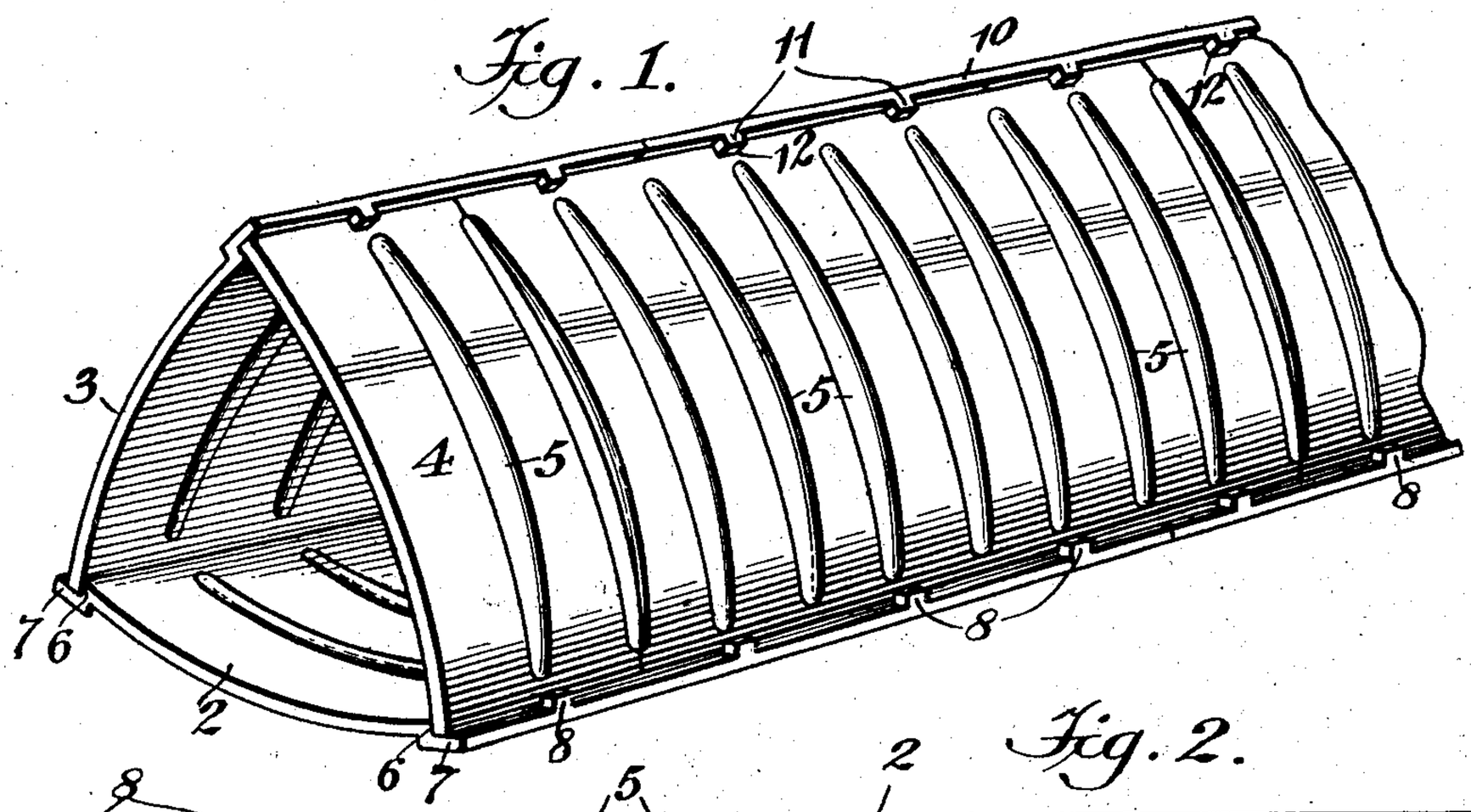

Fig. 2.

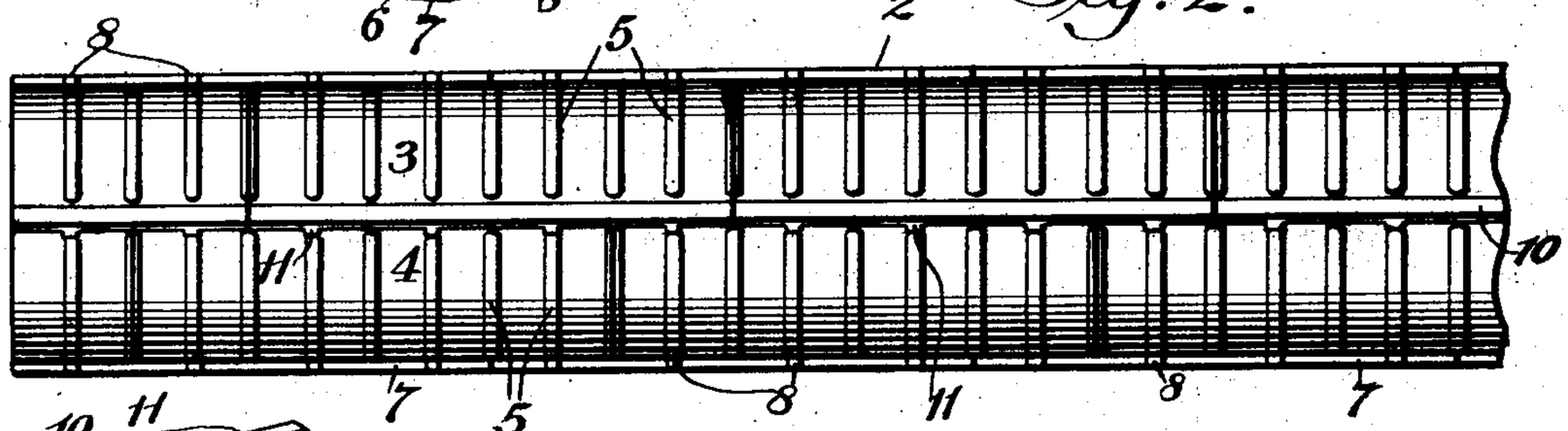

Fig. 3.

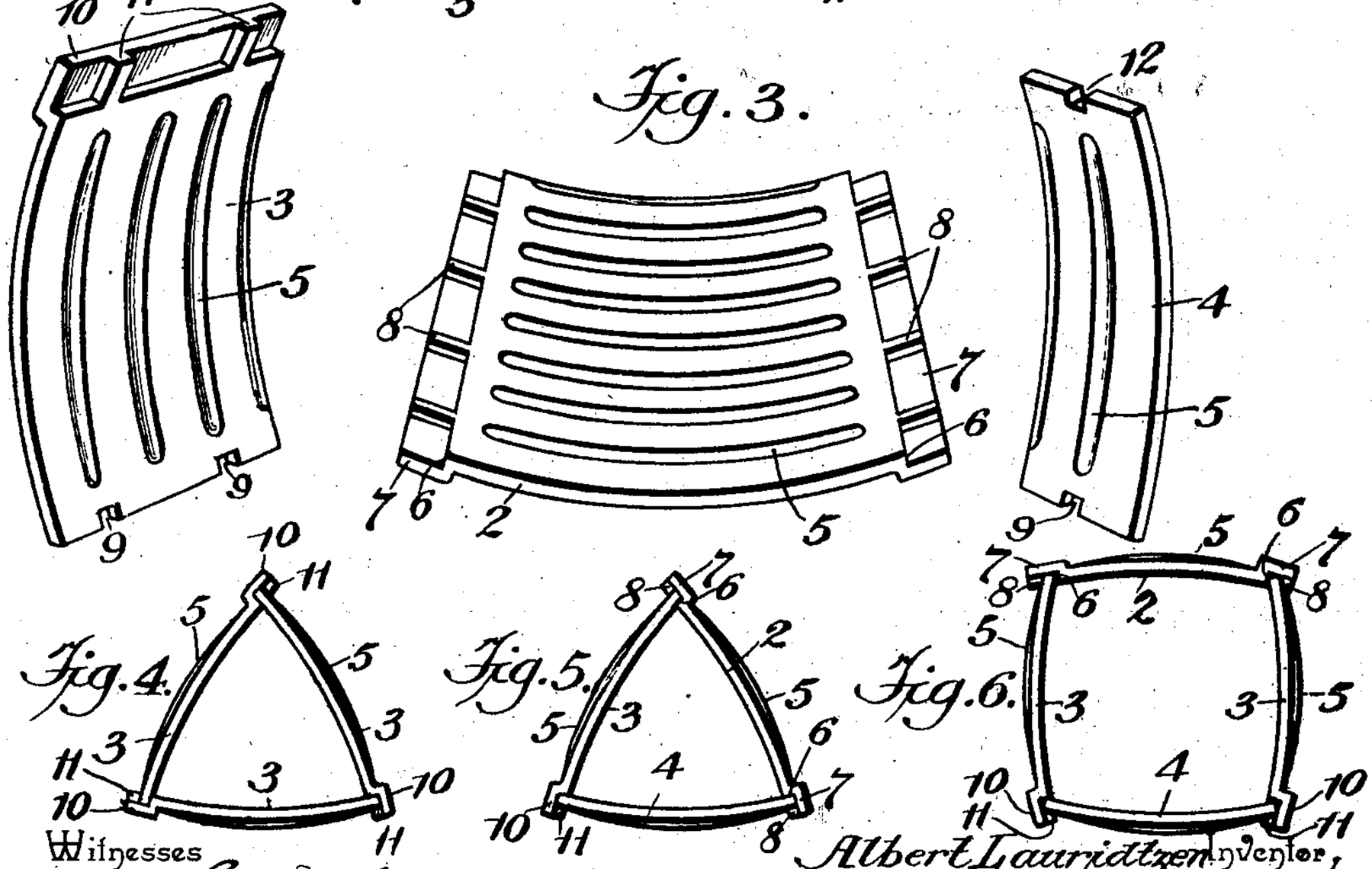

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses

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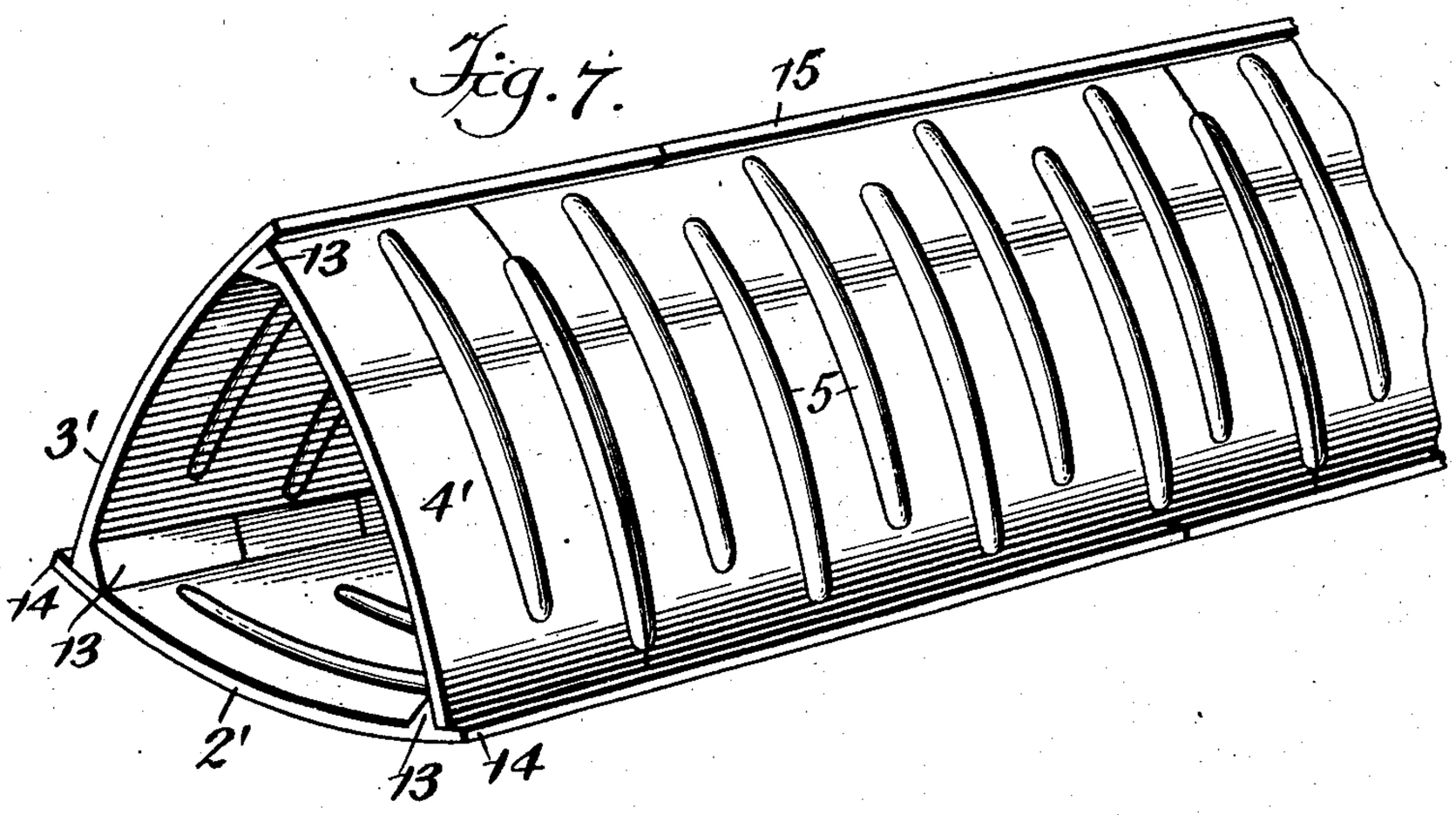
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 7.



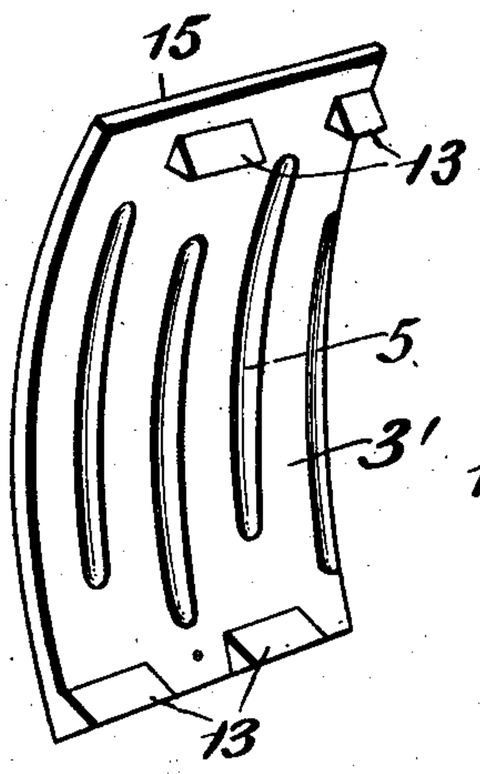
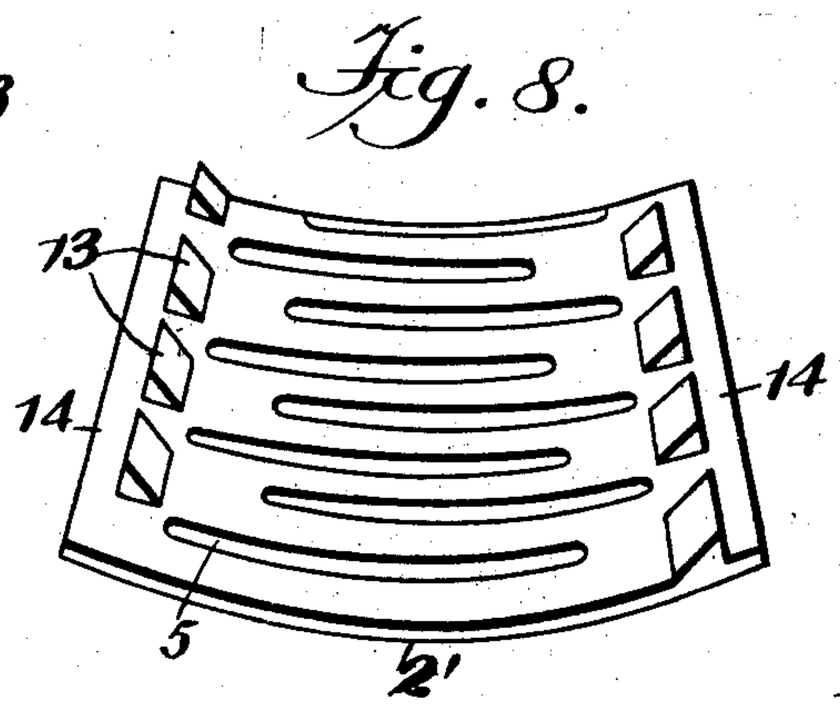


Fig. 8.



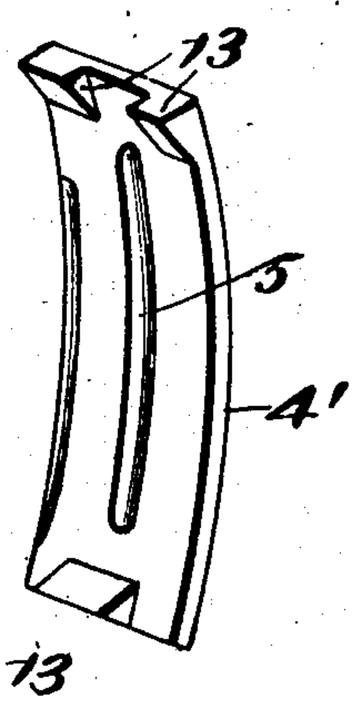


Fig. 9.

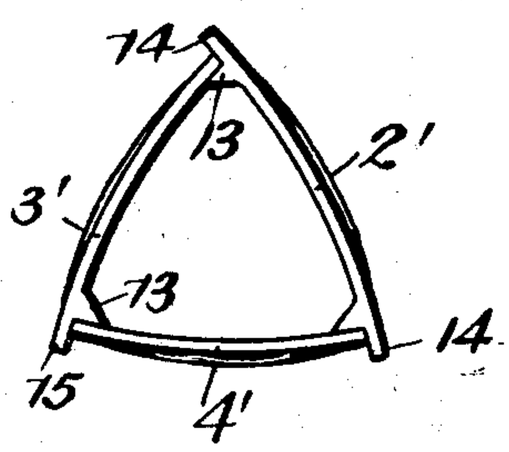


Fig. 10.

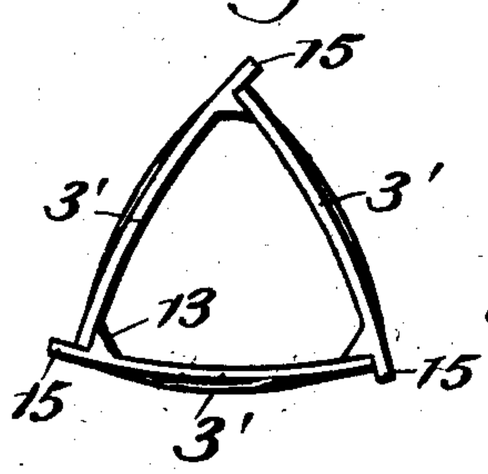
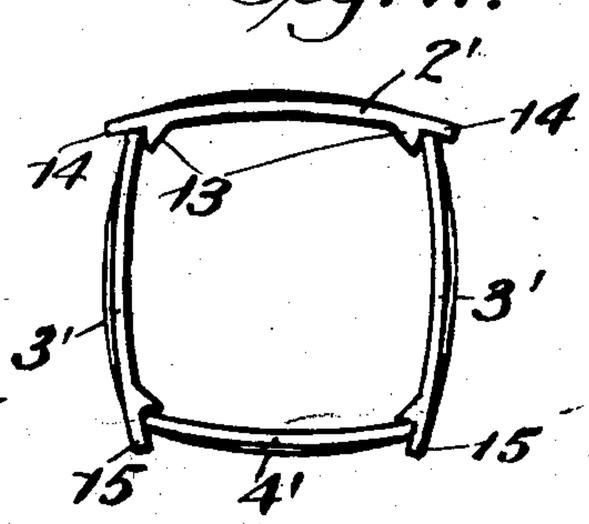


Fig. 11.



Witnesses

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No. 746,112. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

ALBERT LAURIDTZEN, OF LYONS, MICHIGAN.

CULVERT.

SPECIFICATION forming part of Letters Patent No. 746,112, dated December 8, 1903.

Application filed April 18, 1903. Serial No. 153,285. (No model.)

To all whom it may concern:

Be it known that I, ALBERT LAURIDTZEN, a citizen of the United States, residing at Lyons, in the county of Ionia and State of Michigan, have invented a new and useful Culvert, of which the following is a specification.

This invention relates to certain improvements in culverts, and more particularly to that class known as "portable" or "sectional" culverts.

The primary object of the invention is to provide a simple, inexpensive, and efficient device of this character adapted for use beneath railway-tracks, roadways, and the like or in the construction of sewers, conduits, or similar structures.

A further object of the invention is to provide a sectional culvert which may be easily and readily set up without the aid of skilled labor and which may be compactly packed for shipment or transportation.

A further object is to produce a culvert formed in two or more sections interlocked together in such a manner as to prevent independent longitudinal movement of said sections, while at the same time permitting the individual sections to expand laterally when water freezes in the culvert and return to their original positions as soon as normal conditions are restored.

A further object is to construct a culvert composed of a series of curved and transversely-corrugated metallic plates, said culvert being of triangular form in cross-section and having the interlocking edges of the plates so disposed as to permit said plates to be readily interchanged when desired.

A still further object is to provide a device of the character described, the construction and relative disposition of the several parts being such that the individual sections or plates comprising the culvert will have a tendency to give or spring inwardly when frozen earth expands on their outer surfaces, thus preventing breakage.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

In the accompanying drawings, Figure 1 is a perspective view of a culvert constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a detail perspective view of the several sections or plates comprising the culvert detached. Figs. 4, 5, and 6 are end views of a culvert, showing, respectively, different ways of arranging the sections or plates shown in Fig. 1. Fig. 7 is a perspective view of a modified form of culvert. Fig. 8 is a detail perspective view of the sections or plates shown in Fig. 7 detached; and Figs. 9, 10, and 11 are end views of a culvert, illustrating several different ways of arranging the plates shown in Fig. 7.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The culvert, which is preferably triangular in cross-section, comprises a base-plate 2 and sectional side plates 3 and 4. The plates are made in suitable lengths, abutting at opposite ends and arranged to break joint at their longitudinal junctions, as clearly shown in Fig. 2 of the drawings. The base-plate 2 and side plates 3 and 4 are preferably formed of metal, being slightly curved in cross-section and formed with a series of transversely-disposed ribs or corrugations 5, varying in number and distance apart, according to the size of the plate and strength required for the culvert. The base-plate 2 is formed with shoulders or offsets 6, defining outwardly-extending flanges 7, adapted to receive the lower edges of the side pieces 3 and 4, respectively, which abut against said shoulders and retain the several parts in position. Secured to the flanges 7, and preferably formed integral therewith, are a number of upwardly-extending locking lugs or blocks 8, extending the entire width of said flanges, the upper edge of each of which lies flush with upper face of the base-plate 2, said lugs or blocks being adapted to fit in correspondingly-arranged openings or pockets 9, formed in the lower edges of the side plates 3 and 4, re-

spectively. The upper edge of the side plate 3 is provided with a similarly-arranged flange 10, provided with interlocking lugs or blocks 11, adapted to engage the openings or pockets 12, formed in the upper edge of the side plate 4. The upwardly-extending lugs prevent the side plates from moving longitudinally, while the outwardly-extending flanges form guides, permitting said plates to expand and contract laterally when an outward pressure is exerted on the interior walls of the plates—as, for instance, when water freezes in the culvert. The base and side plates being formed of metal will also have a tendency to give or spring inward slightly when subjected to any great external strain or pressure incident to the expansion of the earth surrounding the culvert, thereby preventing said plates from being broken or otherwise injured.

In laying the culvert a ditch is first dug where the culvert is to be formed and a number of base-plates laid end to end at the bottom of the ditch. The culvert is then formed from one end by placing a one-fourth plate on one side and a one-half plate on the other, the locking-lugs engaging the openings or pockets and interlocking said plates with the base and with each other. Long plates are then placed in position on each side to any desired length and the culvert finished with a one-fourth plate on one side and a one-half plate on the bottom, after which the ditch is filled in, covering and protecting the culvert.

The sectional plates comprising the culvert (shown in Fig. 1 of the drawings) are so constructed as to be readily interchanged, and, if desired, the culvert may be formed entirely of the side plates 3, as clearly shown in Fig. 4 of the drawings, or by arranging the plates as shown in Fig. 6 a substantially rectangular culvert is obtained. Although I have shown and prefer to use the plate 2 for the base, it is obvious that any one of the plates comprising the culvert may be used for this purpose, and the culvert may be turned and supported on any one of its sides, as desired, the parts being securely interlocked, no matter in which position the culvert is placed.

In Fig. 5 I have shown the side plate 4 used as a base, the parts being locked together in the manner before stated.

In Fig. 7 I have illustrated a modified form of culvert, in which the base-plate 2′ and side plates 3′ and 4′ are formed with integral interlocking lugs or blocks 13, the blocks on one side of the plate being arranged out of alinement with the blocks on the opposite side, or, in other words, staggered, so as to permit said blocks to intermesh when the several sections are secured together. The blocks on the base-plate in this case are arranged some distance from the edge thereof, so as to form flanges 14, disposed in the same plane as the body of the plate, the function of which is analogous to flanges 7 of Fig. 1—namely, to permit the expansion and contraction of the side plates without complete separation of the parts. The upper row of lugs or blocks on the side plate 3′ are so arranged as to define a flange 15, and said blocks intermesh with the upper lugs or blocks on the side plate 4′ when the several sections are secured together, preventing longitudinal movement of the plates. The plates are also arranged to break joint, as clearly shown in Fig. 7 of the drawings.

In Fig. 9 I have shown a different manner of arranging the plates shown in Fig. 6, the parts being reversed and the side plate 4′ used as the base, while in Fig. 10 the culvert is shown as composed of the side plates 3′, arranged in the manner illustrated.

In Fig. 11 I have illustrated a substantially rectangular culvert constructed from the sides and base-plate of the culvert shown in Fig. 7.

From the foregoing description it will be seen that I have provided an extremely simple, inexpensive, and durable culvert, in which the use of bolts, rivets, and similar fastening devices are dispensed with, the several sections comprising the culvert being interlocked and so arranged as to be easily laid without the employment of skilled labor, and when the water in the culvert becomes frozen solid the culvert will not be broken, the flanges permitting the side plates to be temporarily forced apart by the expansion of the freezing water.

By having the several sections comprising the culvert formed with transversely-disposed corrugations it not only strengthens the culvert, but also causes the earth to engage the outer corrugations, preventing endwise movement of said sections.

Having thus described the invention, what I claim, and desire to secure by Letters Patent, is—

1. A sectional culvert comprising a base, upwardly-extending lugs formed on the base, and side pieces provided with corresponding interlocking lugs adapted to engage the base and each other.

2. A sectional culvert comprising a base provided with oppositely-disposed seating-flanges, locking members formed on the flanges and side pieces provided with corresponding locking members adapted to engage the flanges and each other.

3. A sectional culvert comprising a base provided with oppositely-disposed seating-flanges, upwardly-extending lugs formed on said flanges and side pieces having their lower portions provided with recesses adapted to receive said lugs and their upper portions provided with interlocking members.

4. A sectional culvert comprising a curved and corrugated base-plate provided with oppositely-disposed seating-flanges, locking-lugs formed on said flanges and curved and

corrugated side pieces provided with corresponding recesses adapted to engage said lugs and each other.

5. A sectional culvert comprising a base provided with oppositely-disposed seating-flanges, locking members formed on the flanges and side pieces arranged to break joint with each other provided with corresponding locking members adapted to engage the flanges and each other.

6. A sectional culvert comprising, interchangeable corrugated plates provided with seating-flanges having interlocking faces and arranged to break joint with each other.

7. A sectional culvert composed of three interchangeable plates arranged in triangular form and comprising a base-plate and side pieces adapted to interlock with each other, the base-plate being provided with seating-flanges having upwardly-extending lugs formed thereon and the side pieces being formed with corresponding recesses adapted to receive said lugs, said side pieces being arranged to break joint with each other.

8. A sectional culvert comprising a curved corrugated base-plate provided with oppositely-disposed seating-flanges having upwardly-extending locking-lugs formed thereon, curved corrugated side pieces arranged to break joint with each other and having their lower portion provided with recesses adapted to receive said locking-lugs and their upper portions provided with interlocking members.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALBERT LAURIDTZEN.

Witnesses:
ALBERT S. MORSE,
L. E. MORSE.