No. 854,397. PATENTED MAY 21, 1907.

F. S. & F. H. BEACH.

CULVERT.

APPLICATION FILED AUG. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

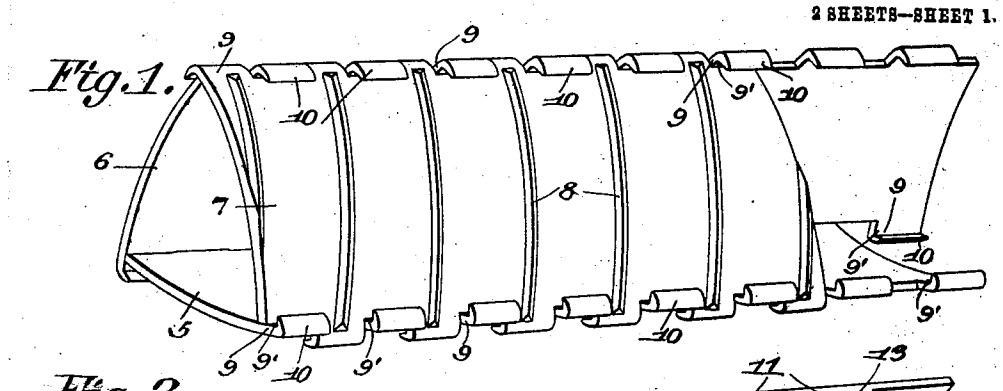


Fig. 2.

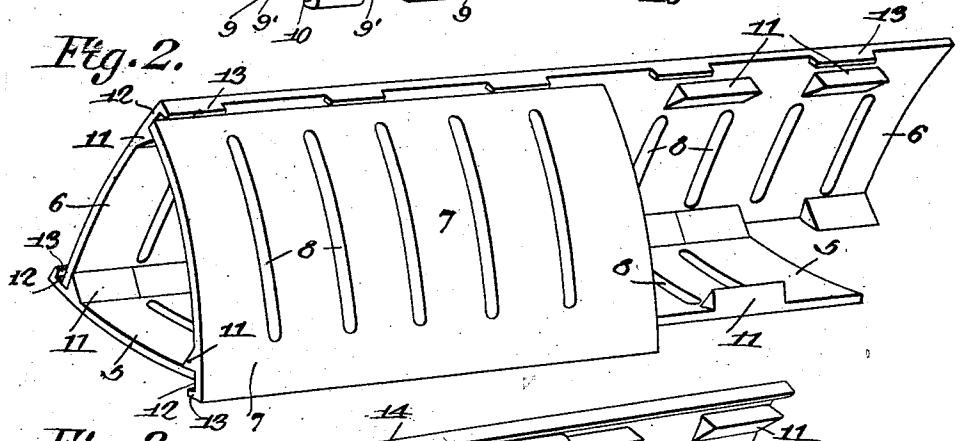


Fig. 3.

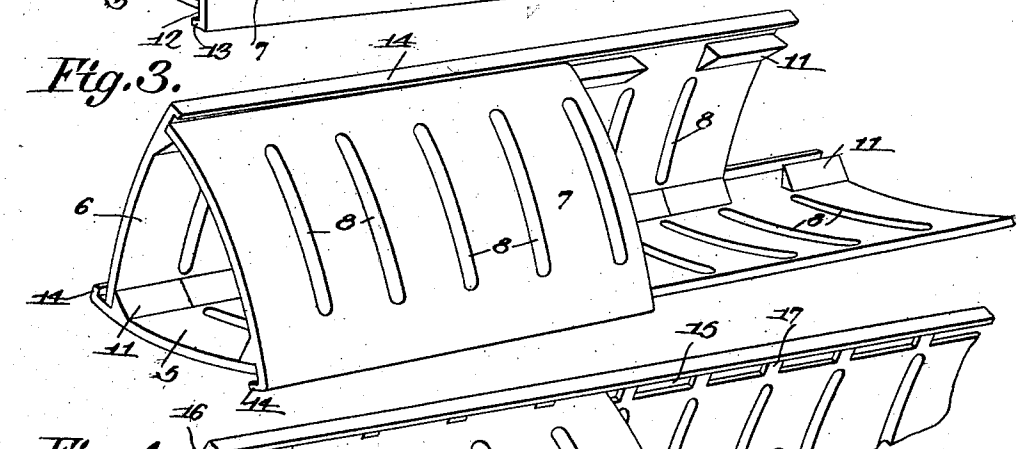
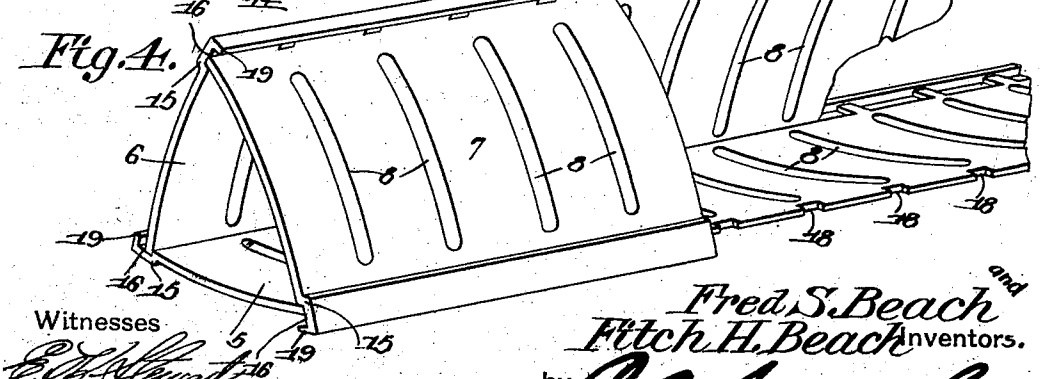


Fig. 4.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

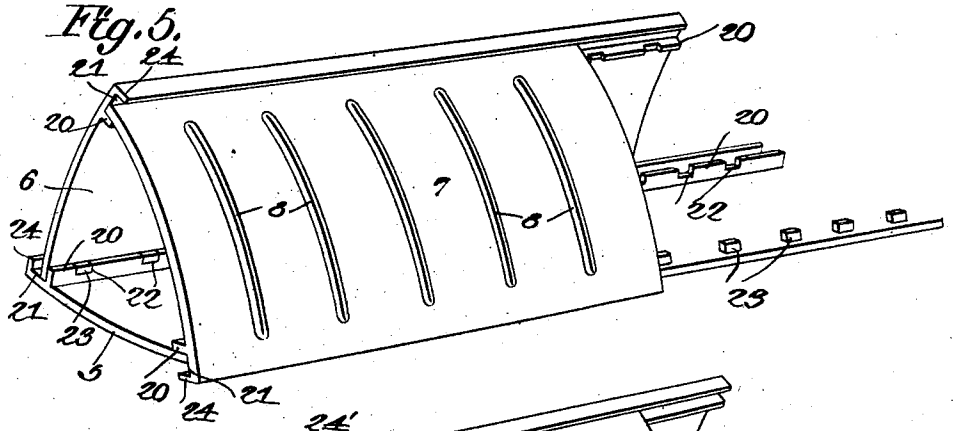


Fig. 6.

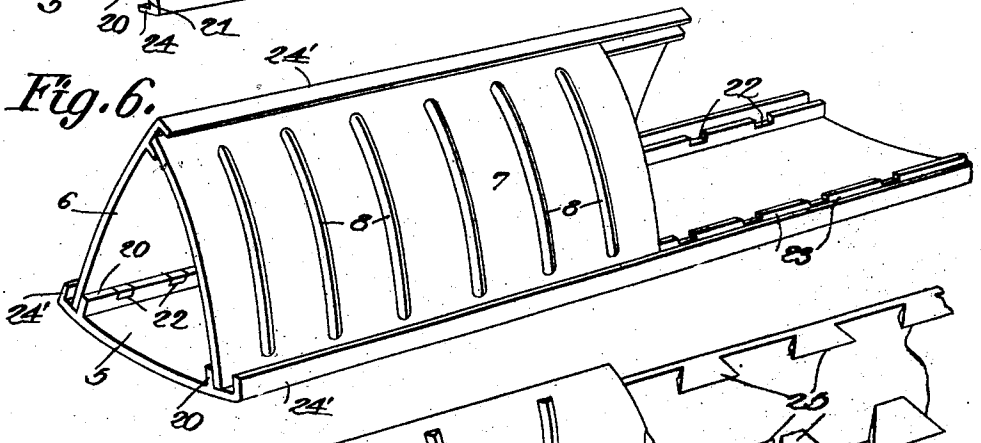


Fig. 7.

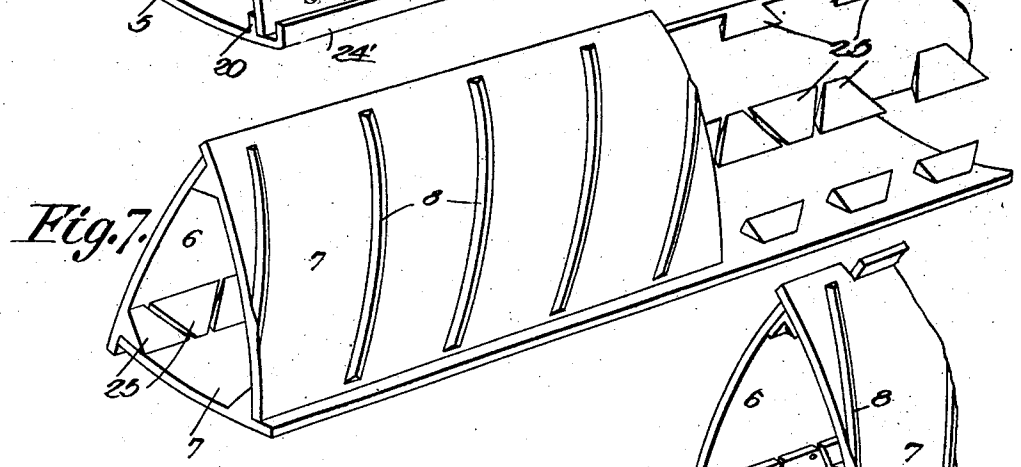


Fig. 8.

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UNITED STATES PATENT OFFICE.

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CULVERT.

No. 854,397. Specification of Letters Patent. Patented May 21, 1907.

Application filed August 11, 1905. Serial No. 273,786.

To all whom it may concern:

Be it known that we, FRED S. BEACH and FITCH H. BEACH, citizens of the United States, residing at Charlotte, in the county of Eaton 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 sectional culverts of that general class designed for use beneath railway-tracks, roadways and the like or in the construction of sewers, conduits and similar structures. In the manufacture of culverts of this character it has heretofore been the custom to mold or otherwise form the several sections of the culvert with interlocking lugs and to provide the adjacent edges thereof with seating flanges to permit independent lateral movement of the several sections when the water in the culvert freezes. It has been found by experience, however, that when the water in the culvert freezes the lateral pressure on the walls of the culvert sections will displace said sections to such an extent as to disengage the locking lugs and thereby cause the culvert to collapse when the ice in the latter melts.

The object of the present invention is to obviate this difficulty by providing means for limiting the lateral movement of the several culvert sections so that said sections will be retained in constant engagement with each other regardless of climatic conditions while at the same time permitting the requisite lateral movement of said sections necessary to prevent injury to the same when subjected to internal pressure.

With these and other objects in view 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, proportions and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

In the accompanying drawings forming a part of this specification:—Figure 1 is a perspective view of a culvert constructed in accordance with my invention. Fig. 2 is a similar view illustrating a modified form of the invention. Fig. 3 is a perspective view showing a modified form of Fig. 2. Fig. 4 is a perspective view illustrating a further modification. Fig. 5 is a perspective view showing each section of the culvert provided with parallel ribs for the reception of the unobstructed edge of the adjacent section. Fig. 6 is a similar view showing the opposite longitudinal edges of the base section provided with parallel ribs. Fig. 7 is a perspective view of a further modification in which the culvert sections are formed with dove-tailed interlocking lugs. Fig. 8 is a similar view of a still further modification wherein the interlocking lugs are formed of angle iron.

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

Several forms of culverts are herein shown for the purpose of illustrating the different ways of accomplishing the same result namely; preventing excessive lateral movement of the culvert sections.

The culverts which may be constructed of metal or other suitable material are preferably triangular in cross section, as shown, and each comprises a base 5 and sectional side plates 6 and 7. The plates are made in suitable lengths, abutting at opposite ends and arranged to break joint at their longitudinal junctures, said plates being preferably slightly curved or bowed in cross section and formed with a series of transversely disposed strengthening ribs or corrugations 8, varying in number and distance apart according to the size of the plates and strength required for the culvert.

In the preferred form of the invention, shown in Fig. 1 of the drawings, the plates are interchangeable and each provided at its opposite longitudinal edges with a plurality of spaced locking lugs 9 adapted to interlock with the corresponding lugs of an adjacent section when the several sections are assembled, said lugs forming interrupted seating flanges 9′ for the edges of the plates whereby said plates are free to move laterally when the water in the culvert freezes. The locking lugs 9 are formed with lateral projections or flanges 10, which engage the curved body portions of adjacent plates and serve to limit the lateral movement of said plates when the water in the culvert freezes. By having the locking lugs formed in the manner described

said lugs will be retained in constant engagement with each other regardless of climatic conditions, so that when the ice in the culvert melts, the plates will slide back to their former positions and thereby prevent the culvert from collapsing.

In Fig. 2 of the drawings the base plate 5 and the side plates 6 and 7 are each provided with a series of upwardly projecting triangular shaped interlocking lugs 11 spaced inwardly from the edges thereof to form seating flanges 12 for the reception of the longitudinal edges of adjacent plates, the longitudinal edge of each plate being formed with a plurality of laterally projecting flanges or stop lugs 13 similar to the lugs shown in Fig. 1 for limiting the lateral movement of said plates, while in Fig. 3 a continuous flange or stop rib 14 is provided for accomplishing the same purpose.

In Fig. 4 each plate comprising the culvert is provided with a shoulder or offset 15 defining a seating flange 16 provided with locking lugs 17 which engage corresponding notches or recesses 18 formed in the longitudinal edge of the adjacent plate. In this case the offset edge of each plate is provided with a continuous stop rib or flange 19 similar to that shown in Fig. 3 for limiting the lateral movement of the several plates, although one or more spaced stay lugs may be employed in this form of the device if desired.

In Fig. 5 there is illustrated a further modification in which each plate is formed at the edge thereof with a longitudinally disposed upwardly extending rib 20 defining a seating flange 21 and provided at intervals with notches or recesses 22 adapted to receive spaced locking lugs 23 projecting from the inner face of the plate at the opposite edge thereof, there being a similar longitudinal rib or flange 24 formed on one edge of each plate and spaced from the rib 20 for limiting the lateral movement of said plates.

Fig. 6 shows a culvert similar in construction to that shown in Fig. 5 only the base plate 5 is formed with a stop rib or flange 24 at each longitudinal edge thereof.

A further modification is illustrated in Fig. 7 of the drawings in which the several plates comprising the culvert are provided with interlocking dovetailed lugs 25 which allow a limited lateral movement of the plates but prevent complete separation of the parts, while in Fig. 8 the dovetailed locking lugs 26 are formed of angle iron, as shown, thereby serving to reinforce and strengthen the culvert and at the same time limit the lateral movement of the independent sections.

From the foregoing description it will be seen that the sectional plates of the different culverts are free to expand or move laterally and at the same time prevented from becoming disengaged from each other which is a material advantage in this class of devices inasmuch as it effectively prevents collapsing of the culverts after being once placed in position.

Having thus described the invention, what is claimed is:—

1. A sectional culvert comprising a plurality of laterally-movable sections provided with interlocking lugs, and projections carried by and extending at an angle from the free ends of the lugs and adapted to engage the exterior walls of an adjacent section for limiting the lateral movement of said sections.

2. A sectional culvert comprising a plurality of laterally-movable sections each provided with interlocking lugs, the spaces between the lugs constituting an interrupted seating flange, and means carried by and extending at an angle from the free ends of the lugs and adapted to engage the exterior walls of an adjacent section for limiting the lateral movement of said sections.

3. A sectional culvert comprising a plurality of laterally-movable interchangeable sections provided with interlocking lugs the ends of which are bent at an angle to the longitudinal plane of the lugs for engagement with the exterior walls of an adjacent section thereby to limit the lateral movement of said sections.

4. A sectional culvert comprising a plurality of laterally movable sections arranged in substantially tri-angular form and provided with interengaging parts, and a projection on each section and extending laterally at an angle from the locking means for engagement with the exterior walls of an adjacent section thereby to limit the lateral movement of said sections.

5. A sectional culvert comprising a plurality of laterally movable sections having interengaging parts for locking said sections against longitudinal movement, and means on each section independent of the locking means for limiting the lateral movement of said sections.

6. A sectional culvert comprising a plurality of laterally movable sections having interengaging parts for locking said sections against longitudinal movement, and means independent of the locking means and extending at an angle from the longitudinal edge of each section for limiting the lateral movement of said sections.

7. A sectional culvert comprising a plurality of laterally movable sections having interlocking parts, and means on each section independent of the locking means and over-lapping the exterior walls of adjacent sections for limiting the lateral movement of said sections.

8. A sectional culvert comprising a plurality of lateral movable interlocking sections, and a flange on each section and extending at an angle from the locking means

for engagement with the exterior walls of adjacent sections thereby to limit the lateral movement of said sections.

9. A sectional culvert comprising a plurality of laterally movable sections having their opposite longitudinal edges provided with spaced recesses defining locking lugs adapted to engage the locking lugs on an adjacent section, and projections carried by and extending at an angle from said lugs and over-lapping the exterior walls of adjacent sections for limiting the lateral movement of said sections.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

FRED S. BEACH.
FITCH H. BEACH.

Witnesses:
FRED A. FAIRCHILD,
C. L. THOMAS.