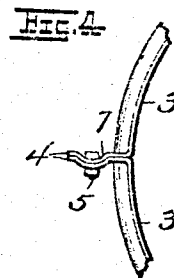
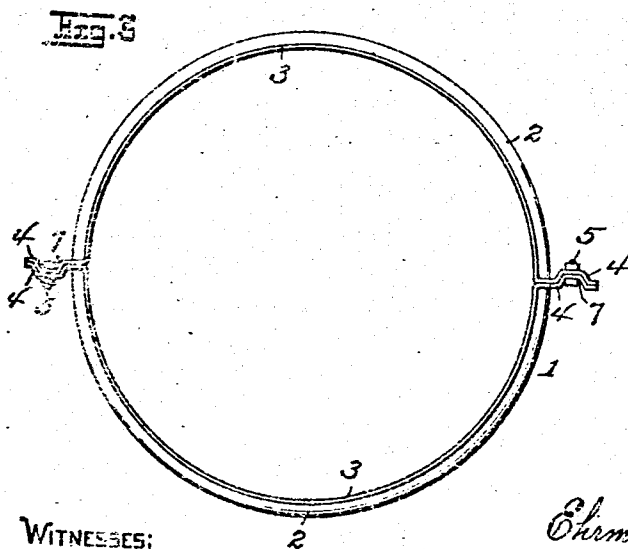
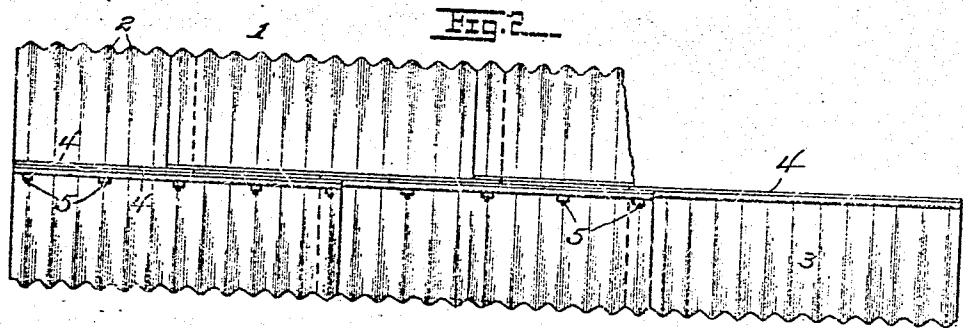
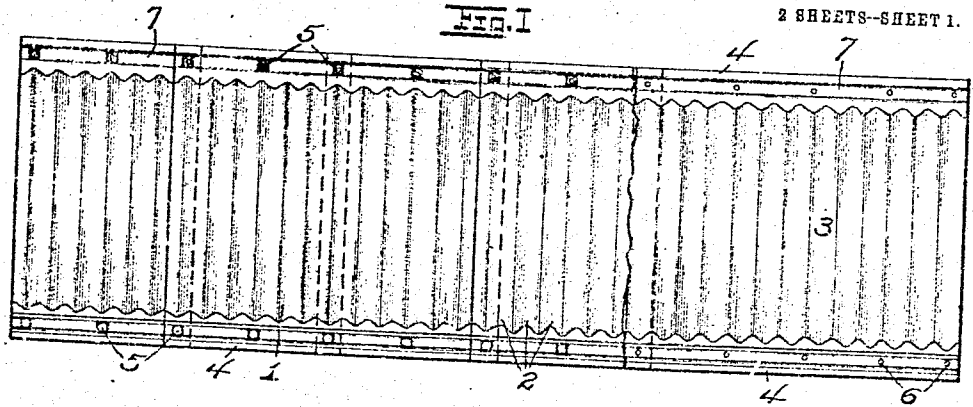


987,693.

E. F. VON BORRIES.
SHEET METAL TUBING SEGMENT.
APPLICATION FILED DEC. 2, 1910.

Patented Mar. 28, 1911.

2 SHEETS--SHEET 1.



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2 SHEETS-SHEET 2

Fig. 5

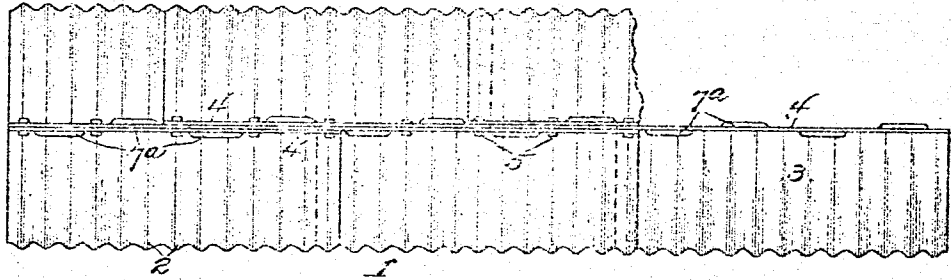


Fig. 6

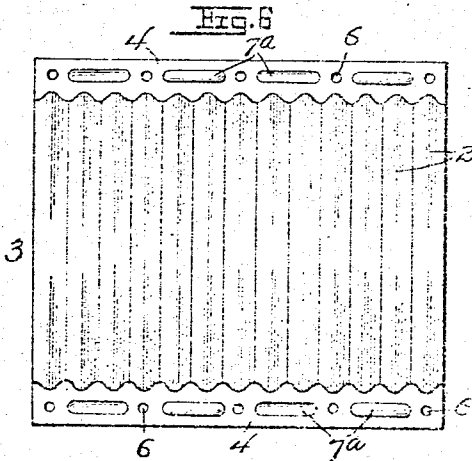


Fig. 7

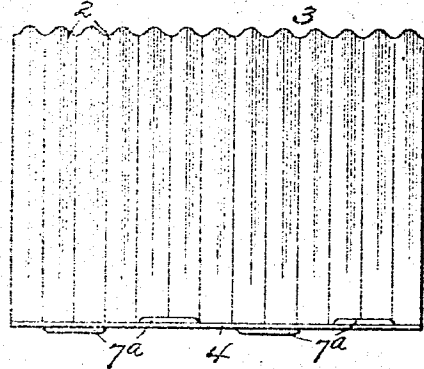
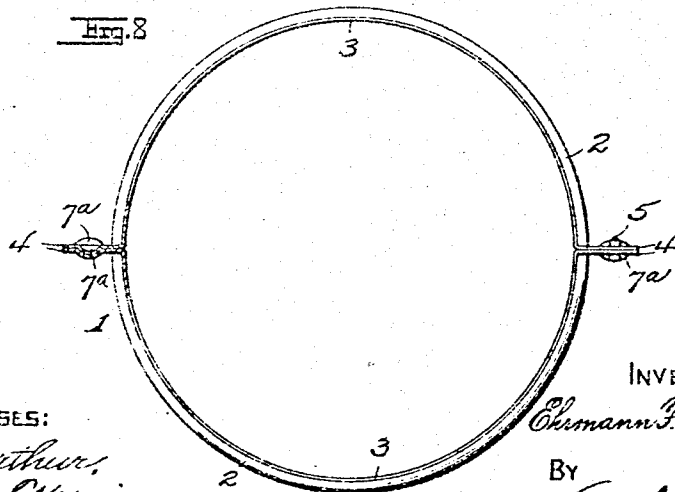


Fig. 8



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SHEET-METAL-TUBING SEGMENT.

987,693.

Specification of Letters Patent. Patented Mar. 28, 1911.

Application filed December 2, 1910. Serial No. 595,290.

To all whom it may concern:

Be it known that I, EHRMANN F. VON BORRIES, a citizen of the United States of America, and resident of East Shore Park, White Bear Lake, county of Washington, and State of Minnesota, have invented certain new and useful Improvements in Sheet-Metal-Tubing Segments, of which the following is a specification.

This invention relates broadly to segmental sheet-metal pipe, or tubing, and specifically to corrugated tubing segments designed for employment in the formation of cylindrical metal culverts, drains, well-curbings, flumes, and the like.

The primary object of this invention is to provide lateral securing flanges for tubing segments adapted to interfit with the flanges of like segments, said flanges being so constructed, that, when opposite or companion segments are bolted together to form a tubular body, a maximum of resistance is offered against lateral bolt-shearing movement thereof, induced by the pressure of the load supported by said body.

A further object is to provide a flange construction for tubing segments which will give to an assembled structure increased strength and rigidity.

A still further object within the contemplation of the invention is to provide a pipe segment which is reversible, which is symmetrical and interchangeable with every other such segment of equal size, and which is adapted to be nested for packing or for shipment with other like segments.

With these and other objects in view, the invention finally consists in the features of construction and arrangement of parts which will be exemplified in the construction hereinafter set forth, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a partial top plan view of a plurality of segments embodying the invention, assembled to form a tube; Fig. 2 is a side elevation of the same; Fig. 3 is an enlarged end view of a tube formed by united segments embodying the invention; Fig. 4 is a detail view in broken section, showing a slight modification in the form of the securing flange; Fig. 5 is a view similar to Fig. 1, showing a modification of the invention; Fig. 6 is an elevation of the under side of a segment embodying the last men-

tioned modification; Fig. 7 is a side elevation of the same; and Fig. 8 is an enlarged end view, partly in section, of a tube constituted by united segments embodying said modification.

Referring to said drawings, in which like designating characters distinguish like parts throughout the several views—1 indicates a tube having annular corrugations 2 and adapted for employment as a culvert, drain, flume, or other similar purpose, the same being formed of a plurality of connected semi-cylindrical sheet-metal segments 3, whose ends may be connected in any suitable manner, preferably by overlapping, as shown in Figs. 1, 2 and 5. Said segments are further so positioned with relation to each other as to break joints, as shown in said figure.

Each segment has a longitudinal horizontally-directed terminal flange 4 at each side thereof which lie in the same horizontal plane, the corrugations terminating abruptly at the angle formed by the flange with the body of the segment, so that, when a pair of segments are fitted together in oppositely disposed relation, the ends of the corrugations in one abut against those in the other, as is clearly shown in Figs. 3, 4 and 8. The flanges of oppositely disposed plates are adapted to coincide and receive securing bolts 5 in holes 6 provided therein.

Hitherto the flanges have been left plain, and when the tube constituted by assembled segments was subjected to the strain of sustaining a heavy weight, as when employed as a culvert, an outward sliding movement of one flange upon its companion was consequently resisted only by the securing bolts connecting said flanges. This frequently resulted in the bolts either being shorn off, or in the bolt-holes being torn out, thus destroying the efficiency of the tube.

The objection noted is overcome in the present device by the provision of interlocking means in the flanges which assumes much of the strain heretofore borne by the bolts. Said means, in the preferred embodiment thereof, consists of continuous longitudinal flutes 7 formed in the flange intermediate the inner and outer lateral edges of the latter, as is clearly shown in Figs. 1, 2, 3 and 4. Said flute may be of curved form, as shown in Fig. 4, but is preferably made up of angularly disposed planes, as shown in Fig. 3, the latter con-

struction allowing the bolt-head and nut to lie flat when companion segments are secured together.

Each segment is rendered interchangeable by reversing the plan of the flutes in its opposite flange—that is, by forming one flange convex and the other concave, as shown in Fig. 3. Further, by this arrangement of the flutes, provision is made whereby the segments may be closely nested for packing and for shipment.

In the modification illustrated in Figs. 5, 6, 7 and 8, a series of short longitudinally directed flutes 7^a are employed in the flanges instead of the continuous longitudinal flute hereinbefore described, said flutes being constituted by short indentures pressed at intervals along the flange, alternate indentures or flutes preferably being oppositely disposed, or having reverse planes, as shown.

As is obvious, errors in shipping segments and error in assembling the same on the field are avoided by having the segments symmetrical and interchangeable.

Having thus described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. A sheet-metal tubing segment having oppositely disposed lateral flanges, each flange having a longitudinally directed flute formed therein, the flutes of opposite flanges being reversely disposed.

2. A corrugated sheet-metal tubing segment having oppositely disposed lateral flanges, the corrugations terminating at said flanges, and longitudinally extending flutes formed in said flanges, said flutes being formed in opposite sides of the opposite flanges.

3. A sheet-metal tubing segment having opposite lateral flanges, and flutes formed in said flanges in reverse relation whereby said segment is rendered reversible.

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

EHRMANN F. VON BORRIES.

Witnesses:

FRANK R. SCOTT,

ARNOLD PRICKEL.