March 8, 1927. 1,620,089

A. F. FISCHER

HEADWALL STRUCTURE FOR CULVERTS

Filed Dec. 23, 1924

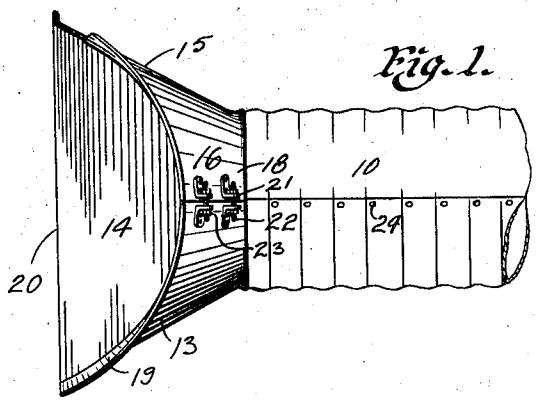

Fig. 1.

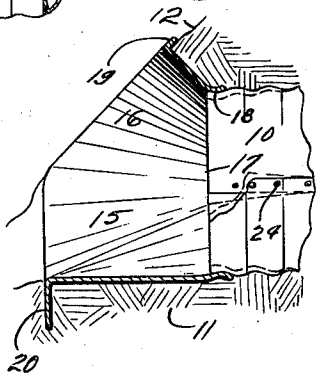

Fig. 5.

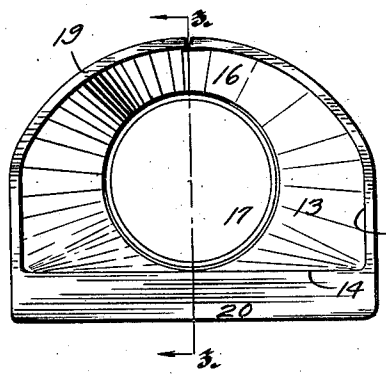

Fig. 2.

Fig. 4.

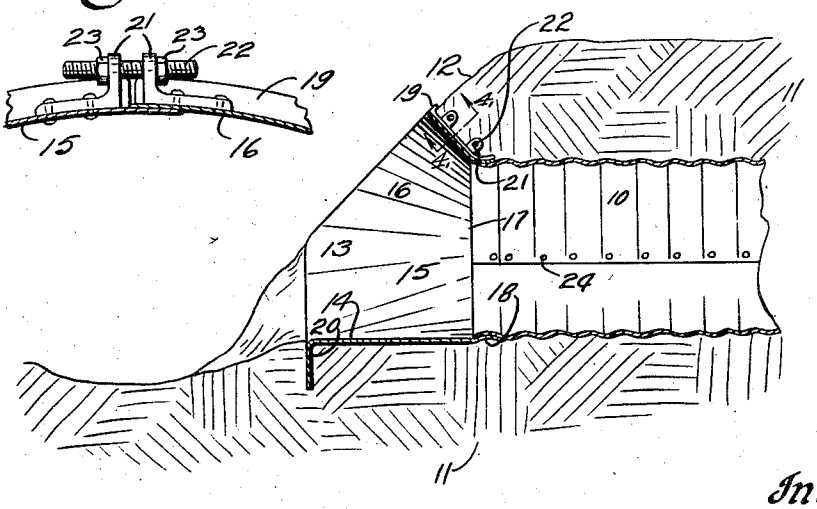

Fig. 3.

Witness

Inventor

Albert F. Fischer

by Bair & Freeman Attorneys

Patented Mar. 8, 1927. 1,620,089

UNITED STATES PATENT OFFICE.

ALBERT F. FISCHER, OF MASON CITY, IOWA.

HEAD-WALL STRUCTURE FOR CULVERTS.

Application filed December 23, 1924. Serial No. 757,584.

The object of my invention is to provide a head wall construction for culverts of simple, durable and comparatively inexpensive construction.

More particularly, my invention relates to a head wall structure arranged to prevent the sloping banks along the ends of the culverts from dropping into the culvert, and at the same time, to provide a downwardly extending apron at the bottom of the head wall structure for preventing the undermining of the dirt below the head wall structure and the culvert itself.

Still a further object is to provide a head wall structure arranged to be bent out of a flat sheet of iron to form a flat bottom, and side and top walls which are curved from one end of the bottom to the other, and bent upwardly and outwardly so that the mouth of the head wall structure is of substantially greater area than the inner end thereof, which fastens to the end of the culvert.

Still a further object is to provide a marginal flange circular in outline on the inner end of the structure, which is adapted to fit around the end of the culvert and be secured thereto for retaining the headwall structure in proper position.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which:

Figure 1 is a top, plan view of an end of a corrugated culvert with my improved head wall structure secured thereto.

Figure 2 is an end view of the outer or mouth end of the head wall structure.

Figure 3 is a central, sectional view taken on line 3—3 of Figure 2.

Figure 4 is a detail, sectional view taken on line 4—4 of Figure 3 showing the bolt connections for securing the two ends of the head wall structure together; and

Figure 5 is a detail, sectional view similar to Figure 3 with the head wall structure riveted or permanently fastened together.

In the accompanying drawings, I have used the reference numeral 10 to indicate generally a corrugated culvert adapted to extend from one side of the road 11 to the other side thereof in the ordinary manner.

My headwall structure is designed to be secured to the ends of the culvert 10 and adapted to project into the sloping bank 12 of the road 11.

My improved head wall structure is formed of a flat sheet of iron 13 bent to form a flat bottom 14 of considerable width from end to end.

The sheet 13 is then bent upwardly to form end walls 15, which are connected together by a curved top or upper wall 16.

It may be here mentioned that the side walls 15 and the top walls 16 are practically curved from one end of the bottom 14 to the other end of the bottom 14, as clearly shown in Figure 2 of the drawings.

The side walls 15 and the top wall 16 are inclined upwardly and outwardly from their inner end so as to form an opening on the inner end of less area than the area of the mouth or outer end of the head wall structure.

The edge of the sheet 13 is bent to form a substantial opening 17, which has a marginal flange 18 thereon adapted to extend over and coact with one of the corrugations in the culvert 10 so that when the head wall structure is tightened or locked, it will be securely fastened to the culvert 10.

The outer edge of the side walls 15 and the top wall 16 is formed with an outturned reinforcing flange 19 for giving rigidity and strength to the head wall structure, which is adapted to support the dirt thereabove and to prevent crushing of dirt pressure on the sides thereof.

The bottom 14 is formed with a downwardly extending apron 20, which is desirable to be embedded in the dirt for preventing the undermining and washing away of the dirt below the bottom 14 and the culvert 10.

The outer edge of the curved top 16 is inclined so as to conform to the sloping bank 12, as clearly shown in Figure 3 of the drawings.

By curving the top 16 and then inclining it upwardly and outwardly, gives me a very substantial structure which supports the dirt thereabove and prevents it from passing into the culvert 10.

The top 16 is formed by bringing the two ends of the sheet 13 together and lapping them over, as shown in Figure 5 of the drawings, giving me what may be properly termed an expansible joint.

In order to hold head wall structures in

position, I provide a pair of apertured flanges 21, which are riveted or otherwise secured to the adjacent ends of the sheet 13 and having a threaded rod 22 extended therethrough.

Nuts 23 are mounted on the opposite sides of the apertured flanges 21 and are threaded on the rod 22.

By tightening the nuts 23, I am able to draw the two apertured flanges 21 toward each other, thus tightening the marginal flange 18 around the culvert 10.

The reinforcing flange 19 on one end of the sheet 13 terminates short of the end of the sheet so as to permit slight adjustment without having the flange 19 of the two ends interfere with each other.

The expansible joint, as clearly shown in Figure 4 of the drawings, enables the head wall structure to be partially opened for permitting the insertion of the culvert 10 into the opening 17 and to be surrounded by the marginal flange 18.

In Figure 5 of the drawings, I have shown a slightly modified form of head wall structure wherein the ends of the sheet 13 are riveted together and the opening 17 is of a fixed diameter.

In order to insert the culvert 10 into the head-wall structure of the type shown in Figure 5, it is necessary to remove a number of rivets 24, which connect the culvert together for some distance and then spring the culvert inwardly so that it assumes the position, shown in dotted lines in Figure 5 and then force the contracted culvert end into the opening 17 and thereafter permitting the contracted culvert to assume its original position where it will be securely in engagement with the marginal flange 18. The rivets 24 are then re-inserted in their openings in the culvert 10.

My head wall structure is particularly designed to afford a comparatively large opening at the ends of the culvert, and at the same time, it is possible to make it of a flat sheet of iron at a minimum expense.

The head wall structure tends to maintain the sloping bank 12 against washouts and other irregularities, which are undesirable in road work.

Some changes may be made in the construction and arrangement of the various parts of my invention, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claim, and modified forms of structure or use of mechanical equivalents, which may be reasonably included within its scope.

I claim as my invention:

A head wall for culvert ends adapted to be mounted upon the end of a culvert comprising a member bent to form a bottom, side and top walls, the inner ends of said bottom, side and top walls being curved to form a circular opening for receiving the culvert, said top wall being bent upwardly from its inner edge for preventing dirt adjacent the head wall from passing into the culvert, a marginal corrugated flange on the inner edge of said member for coacting with and engaging the end of the culvert, a peripheral flange around the outer end of said member, said flange being wider along the bottom of said member whereby an apron is formed.

ALBERT F. FISCHER.