April 28, 1953 J. ALGER 2,636,352

HEADWALL FOR ROAD CULVERTS

Filed Feb. 23, 1950

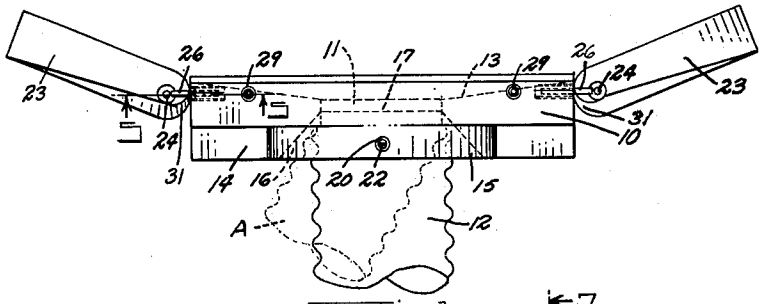


Fig. 1

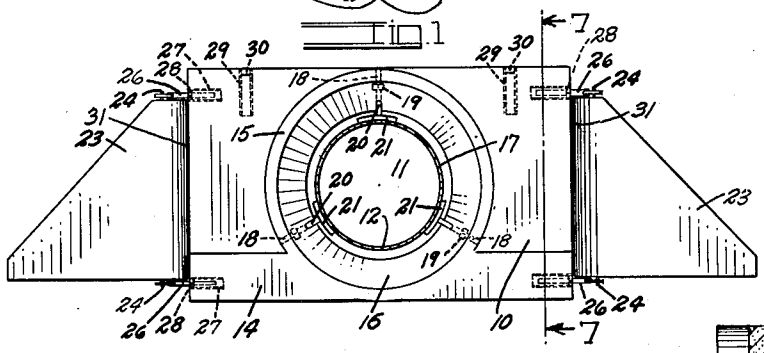


Fig. 2

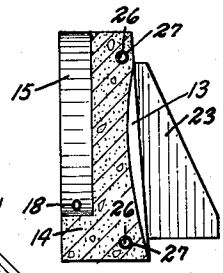


Fig. 7

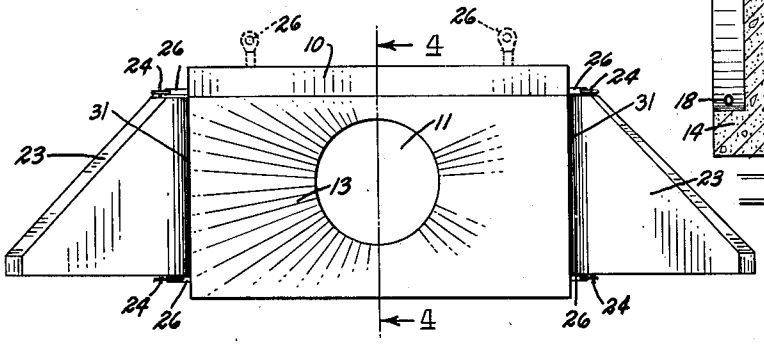


Fig. 3

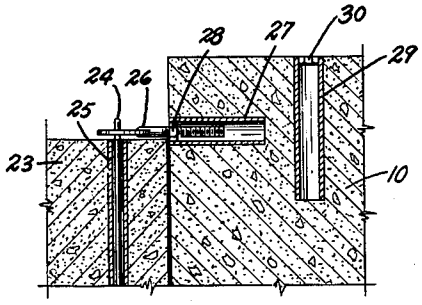


Fig. 5

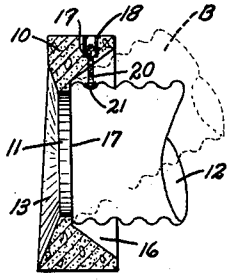


Fig. 4

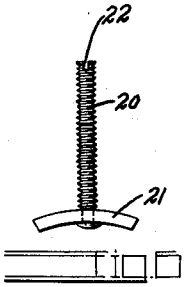


Fig. 6

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HEADWALL FOR ROAD CULVERTS

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3 Claims. (Cl. 61—16)

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This invention relates to a pre-cast concrete headwall for pipe culverts for roadways and the like. A conventional roadway underdrain is usually formed by burying a corrugated metal culvert pipe in the roadway; building concrete forms for a headwall at each extremity of said pipe; pouring concrete in said forms; and thence removing the forms. This procedure is a relatively expensive and time-consuming process.

The principal object of this invention is to provide a pre-cast concrete headwall which can be manufactured in quantities at a central location, thence delivered to the job and slipped over each extremity of a culvert pipe, so as to eliminate all form building and job pouring of the headwall.

Another object of the invention is to so construct the improved headwall that it can be effectively used on culvert pipes, regardless of the incline of said pipe, and regardless of the angle at which the pipe crosses the roadway.

A further object is to provide a pre-cast concrete culvert headwall with side walls or wings which can be adjusted to any desired angle to the face of the headwall, and then permanently secured in place; and to provide means for permanently securing the headwall to the conventional corrugated culvert pipe.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a plan view of the improved pre-cast culvert headwall, illustrating it in place on the extremity of a conventional culvert pipe;

Fig. 2 is a rear elevational view thereof;

Fig. 3 is a front elevational view thereof;

Fig. 4 is a vertical, cross-sectional view, taken on the line 4—4, Fig. 3;

Fig. 5 is an enlarged, detail section, taken on the line 5—5, Fig. 1;

Fig. 6 is an enlarged, detail view of a culvert holding screw employed in the invention; and

Fig. 7 is a cross-section, taken on the line 7—7, Fig. 2.

The improved pre-cast headwall is designed to be used at the ends of a corrugated iron culvert pipe, such as indicated at 12, at the sides of roadway fills to prevent earth from burying the

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ends of the pipe and to direct drainage water through the pipe. Headwalls of this type are at present cast in place by means of forms which are built up and dismantled for each job. This invention avoids the expense of building forms on each separate job, and provides a pre-cast headwall which can be manufactured at a central point and distributed to the points of use without requiring forms.

The invention comprises a solid headwall block 10 of reinforced concrete having a central opening 11 therethrough. The diameter of the opening 11 is less than the outer diameter of the particular culvert pipe 12 for which the headwall is designed.

The forward face of the block 10 inclines forwardly in its entirety as the bottom is approached. This forward face of the block, indicated at 13, is concaved conically inward to the opening 11 from the top, bottom, and two sides of the block 10 to provide a relatively flat, funnel-shaped contour to the front face of the block.

The rear face of the block 10 is substantially vertical, arising from a broad base portion 14. A semicircular flange 15 projects rearwardly from the rear face to a position in alignment with the rear face of the base portion 14 and extends concentrically about the opening 11. The inside face of the flange 15 is inclined inwardly to provide a conical socket 16 in the rear face of the block. The smaller diameter of the conical socket is larger than the diameter of the central opening 11 so that a shoulder 17 is formed about the opening at the rear of the block.

Nut tubes 18 are cast in the flange portion 15, and each supports a nut 19 through which a culvert clamp screw 20 is threaded. The culvert clamp screws 20 are rotatably mounted in arcuate yoke members 21 at their inner extremities, and are provided with screw driver slots 22, or other turning means, at their outer extremities.

The conical socket 16 is designed to allow the culvert pipe 12 to approach the headwall block 10 at any desired horizontal angle, as shown in broken line at "A" in Fig. 1, or at any desired vertical angle, as shown at "B" in Fig. 2.

When installing the improved headwall, the extremities of the culvert pipe 12 are cut on vertical planes parallel to the axis of the roadway, regardless of the angle or position of the culvert pipe. The headwall blocks are then slipped over the extremities of the culvert pipe until the latter rest against the shoulders 17 about the openings 11. The pipe is then sealed to, and secured in, the headwalls by tightening the screws 20 until the yokes 21 are brought securely against

the pipe extremities. The extremities are then grouted permanently into place in the headwalls by completely filling the conical sockets 16 with cement grout completely around the extremities of the culvert pipe.

In certain installations it is desirable to have side walls or wings on the headwall to hold back and protect the earth fill. Such installations are accommodated in the present invention by providing two substantially triangular, pre-cast, reinforced concrete wings 23. The wings 23 are hingedly mounted at each end of the headwall block 10 upon vertical hinge rods 24 extending through vertical receiving pipes 25 which are cast into the wings 23 at the time of manufacture.

The extremities of the rods 24 are held in upper and lower eye bolts 26. The eye bolts extend into eye bolt tubes 27 which are pre-cast into the ends of the headwall block 10 and are threaded through nuts 28 welded or otherwise permanently secured in the outer extremities of the tubes 27. The inner extremities of the wings 23 are rounded about the axis of the pipes 25, as shown at 31, so that they will remain in close proximity to the block 10 at any angle.

The eye bolts 26 and the hinge rod 24 are only for the purpose of providing installation support for the wings 23, for after the installation has been set in place, the end walls are grouted into the headwall 10 by filling the notches formed by the rounded ends 31 so that the entire structure becomes a rigid, inseparable unit.

Two lifting tubes 29 are cast into the upper surface of the block 10 and provided with nuts 30, similarly to the tubes 27. The eye bolts 26 can be removed from the tubes 27 and threaded through the nuts 30 so as to project upwardly from the block 10, as shown in broken line in Fig. 3, to provide means for attaching a hoist sling to the block whereby it may be lowered into its final place. The eye bolts 26 can then be removed and used for supporting the side wings 23, as before described.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A pre-cast headwall unit for application to the extremity of a culvert pipe, comprising: a pre-cast headwall block having a medial opening in its forward face; a circular socket in the rear face of said block, said socket being concentric with and communicating with said opening, the rear open extremity of said socket being of greater diameter than the forward extremity thereof to form a conical wall about said socket; a shoulder about the rear extremity of said opening, the forward extremity of said socket being of greater diameter than said opening to form said shoulder, said shoulder being adapted to receive the extremity of said pipe; and means adapted to contact said pipe so as to maintain the latter concentric with said opening, said conical wall acting to allow said pipe to approach said shoulder at an acute angle from any direction to the plane of said shoulder.

2. A pre-cast headwall unit for application to the extremity of a culvert pipe as described in claim 1 having set screws mounted in said block and extending into said socket in a plane parallel to the plane of said shoulder and adapted to engage said pipe so as to maintain the latter in said socket.

3. A pre-cast headwall unit as described in claim 2 in which the securing means comprises a plurality of clamp screws extending from said block radially into said socket; and a yoke member on each clamp screw held in gripping engagement with said pipe by its respective clamp screw.

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