July 20, 1926.

1,593,488

D. B. DIMICK

CAST IRON HEAD WALL

Filed Nov. 19, 1925

2 Sheets-Sheet 1

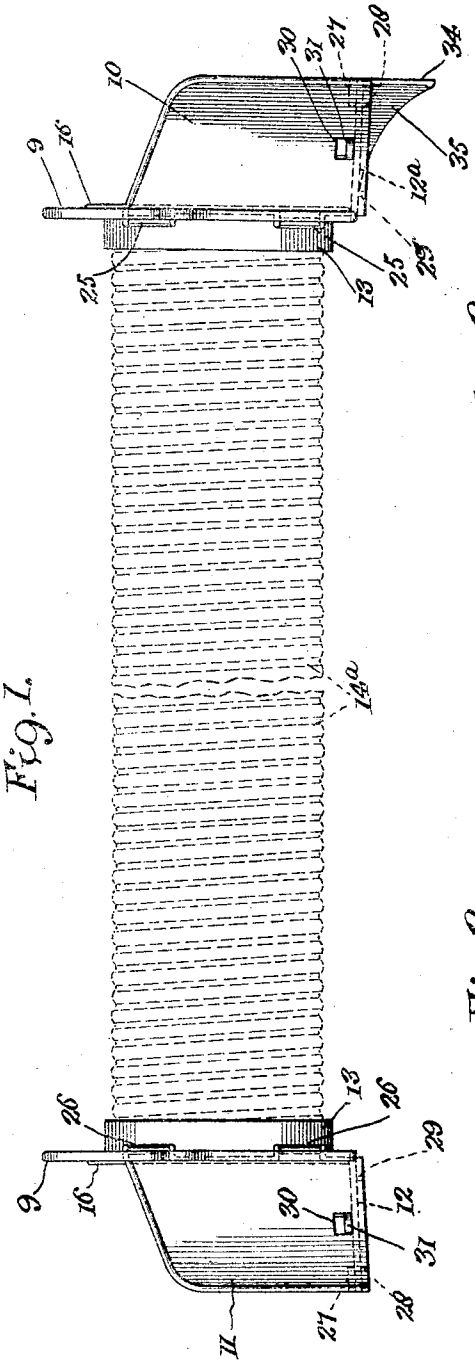


Fig. 1.

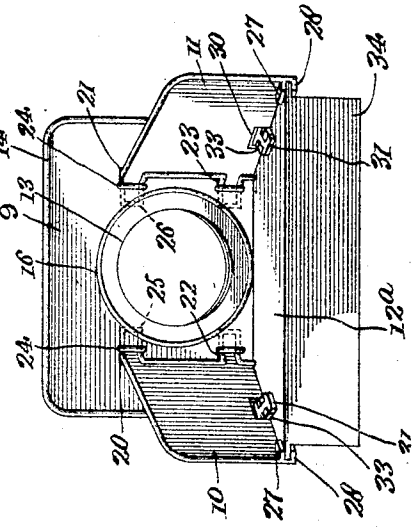


Fig. 3.

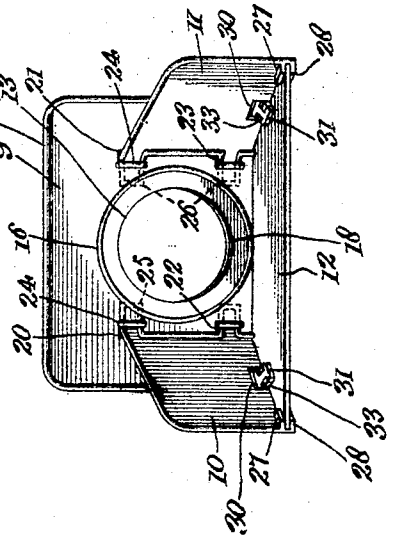


Fig. 2.

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Fig. 4.

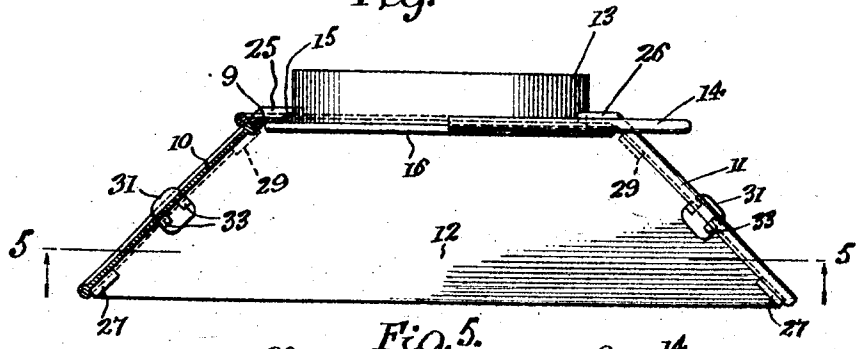


Fig. 5.

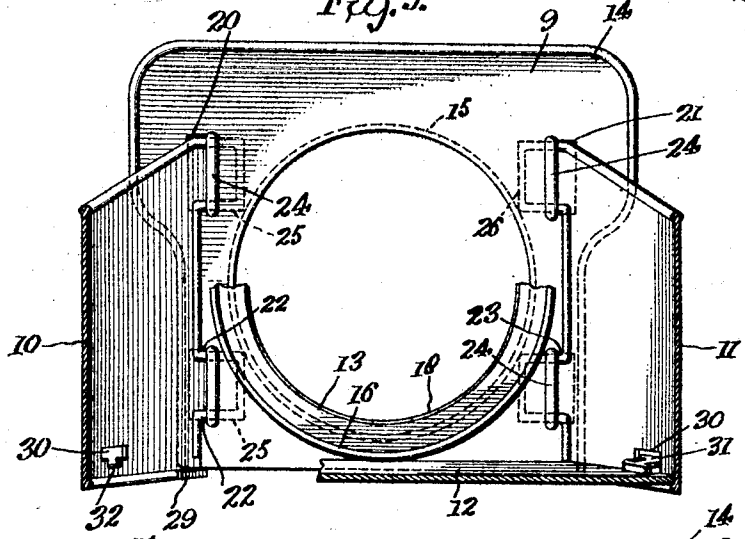


Fig. 6.

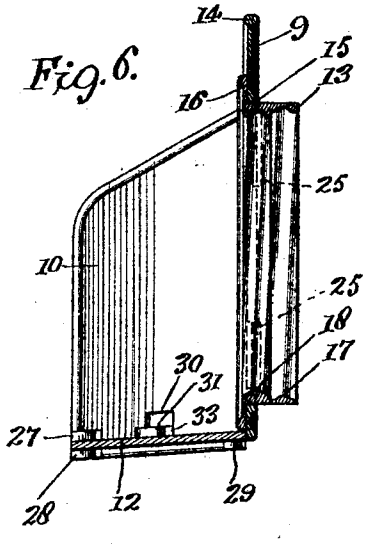


Fig. 8.

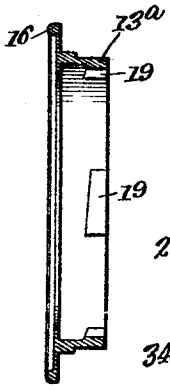
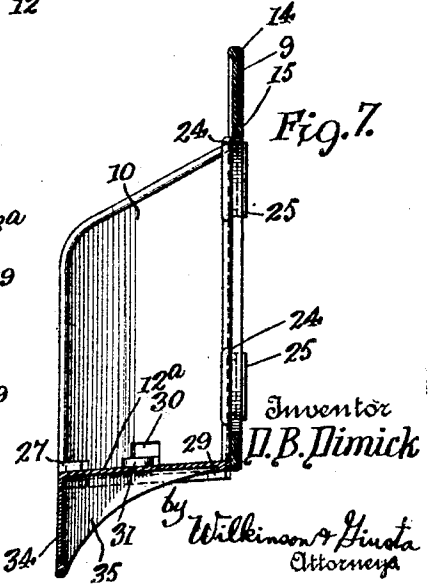


Fig. 7.



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Patented July 20, 1926. 1,593,488

UNITED STATES PATENT OFFICE.

DANIEL BAKER DIMICK, OF BIRMINGHAM, ALABAMA.

CAST-IRON HEAD WALL.

Application filed November 19, 1925. Serial No. 70,092.

The present invention relates to improvements in headwalls for culverts and has for an object to provide an improved headwall constructed with a view to the elimination of delays in installation due to weather conditions, and subject to a low cost due to quantity production, a low transportation cost to the culvert site, and to a low labor cost in the installation.

Another object of the invention is to provide an improved headwall adapted to be manufactured from cast iron, preferably recast pig iron, thus securing permanence, because of the freedom of this material from corrosive action by water, and because such material is not affected by temperature changes.

A further object of the invention is to provide a cast iron headwall possessing great strength and made up of interlocking parts whereby to give freedom from casting strains, the elimination of breakage during transportation and to secure ease of handling in the field.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side view of two of the improved headwalls with a spiral corrugated pipe extending between them.

Figure 2 is a front view of the improved headwall.

Figure 3 is a similar view showing a slight modification.

Figure 4 is a top plan view of the improved headwall taken on an enlarged scale and showing a portion broken away.

Figure 5 is a vertical section taken on the line 5—5 in Figure 4.

Figure 6 is a vertical section taken transversely through the center of the device shown in Figure 2.

Figure 7 is a similar view with the locking ring removed, and

Figure 8 is a separate section taken through a modified form of the locking ring.

Referring more particularly to the drawings the improved headwall is constructed of the back wall 9, side aprons 10 and 11, the bottom apron 12 and some means, for instance the locking ring 13, for securing the headwall on to the culvert pipe, a form of which culvert pipe is indicated by the dotted line 14 in Figure 1.

All of these parts are preferably, though not necessarily, constructed of cast iron. I prefer recast pig iron as this material is but little affected by water corrosion. It is not decomposed by rust when subjected to any weather conditions for years, even for centuries; nor is it affected by temperature changes from sub-zero weather to the temperature of the tropics. Therefore, recast pig iron is particularly adapted as a material of construction in cases where the structure must withstand the ravages of time and weather. The strength of recast pig iron is well known and constant under all conditions, and this property recommends it particularly for headwalls for culverts which must not only withstand changes in temperature, exposure to all the elements of nature, but also be of such strength as to hold the earth pressure of the supported grade. Recast pig iron has been found to be an ideal material for this purpose.

In the use of cast iron, however, the reduction of weight is important, while the conditions to which a headwall is subjected require a unitary construction. These objects are secured by the separate manufacture of the parts 9, 10, 11, 12 and 13 with provision to interlock such parts, whereby all casting strains and strains set up by expansion and contraction due to temperature changes are eliminated. With the parts made up separately, each part may be of a selected weight and size as to be easily transported and handled in the field.

This feature eliminates the necessity of special rigging for handling or placing the headwall, reduces labor costs and allows the headwall to be transported wherever man himself may go. The elimination of breakage, both in rail road transportation and the field, is of great importance.

With the cast iron headwall made up of the separate and interlocking parts referred to installation and labor costs are reduced and the headwall may be set up at any time without regard to freezing or wet weather or in fact regardless of any weather conditions. Hence delay in the completion of grade work is eliminated.

The back wall 9 is preferably cast with a

beaded outer edge or rim 14 and is adapted to be erected vertically at an end of the culvert pipe. There is a central opening 15 (indicated in Figure 6) through which the lock ring 13 may pass. This lock ring is provided with the out-turned flange 16 adapted to engage against the front face of the back wall 9. The lock ring 13 is for the purpose of engaging the culvert pipe while the flange 16 holds the back wall 9 in place on the pipe and prevents dismemberment of the unitary headwall or its disengagement from the culvert pipe. The lock ring 13 may be provided with the internal corrugations to fit a spiral corrugated cast iron pipe constructed according to my prior Patent No. 1,544,057, granted June 30, 1925.

This pipe is made in two sizes to admit of its threading together and the lock ring 13 is preferably made with an internal spirally ribbed diameter 17 of a large size to fit the larger or cuff section of pipe. The ring 13 is also made with the spirally ribbed smaller section 18 to fit the normal pipe.

In Figure 8 the locking ring 13^a is generally of the same type as the locking ring 13 in Figure 6 except that instead of providing spiral corrugations or ribs internally of such ring, the lugs 19 are provided to cooperate with similar lugs on lock joint pipe.

The back wall 9 is provided with the upper pair of vertically elongated slots 20 and 21 disposed at opposite sides of its central opening and with the lower pair of elongated slots 22 and 23. The inner walls of these slots are reinforced by the beads 24 also extending vertically. The side apron 10 is provided with a pair of locking wings 25 extending at an acute angle from the rear vertical edge of said apron and in position to enter the slots 20 and 22 in the back wall. These lugs are intended to lie flat against the rear surface of the back wall and in this position to require the apron 10 to assume a flaring relation to the back wall only.

The companion side apron 11 is similarly provided with the locking wings 26 adapted to enter the slots 21 and 23 of the back wall and to hold the side apron 11 in a divergent position with respect to the opposite side apron 10.

The bottom apron 12 is shaped to fit against the back wall 9 and the lower inner edges of the side aprons 10 and 11; and such side aprons are provided at their outer lower corners with the vertically spaced lugs 27 and 28 forming therebetween slots to receive the side edges of the bottom apron 12. The inner lower corners of the side apron 10 and 11 are provided with the single lugs 29 on which the rear edges of the bottom apron 12 may rest.

Some coupling means is also preferably provided to hold the bottom apron and the side aprons together. For this purpose, at a convenient point in the side aprons are provided the T-shaped slots 30 for receiving the double headed keys 31, the shanks of which are adapted to descend into the smaller lower portions 32 of the slots 30, while one of the heads remains outwardly of the side apron. The other head is adapted to engage the upstanding lugs 33 on the outer edge of the bottom apron. These keys are also preferably of cast iron. In fact the parts throughout are of cast iron, and the aprons are also preferably beaded in order to secure a desirable thinness and lightness in weight combined with great strength.

The device is inserted in the following manner:—

The back wall 9 is placed over the projecting end of the cast iron culvert pipe. The lock ring 13 is then attached to the projecting end of the pipe and the back wall 9 drawn back against the flange 16 of the lock ring. The two side aprons 10 and 11 are then engaged with the back wall by inserting the interlocking wings into the slots in the back wall. Finally, the bottom apron 12 is slipped into place between the lower edges of the side aprons and the locking keys 31, being engaged with the side aprons and bottom apron, the parts are effectively locked in place and into a unitary headwall as the angular interlocking wings 25 and 26 of the side aprons will be prevented from escape through the slots in the back wall due to the angular position at which the side aprons are maintained by the bottom apron 12.

Earth fill is then placed and rammed behind the back wall 9 and side aprons 10 and 11 and under the bottom apron 12. The more earth pressure that is exerted against the surfaces of the headwall only serves to lock the component parts more tightly together.

In Figure 7, the bottom apron 12^a is provided with the front flange 34 and the side flanges 35 to better hold the earth fill.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:—

What is claimed is:—

1. A cast iron knock down headwall comprising a back wall, side aprons coupled detachably to said back wall and a bottom apron extending between the lower portions of said aprons and detachably secured thereto.

2. An improved headwall comprising a back wall adapted to extend about the culvert pipe and be secured thereto, divergent side aprons removably secured to said back

wall, and a bottom apron coupled to said side aprons.

3. An improved headwall comprising a back wall, means to hold said back wall to a culvert pipe, side aprons having means to interlock with said back wall, and a bottom apron coupled to said side aprons and for holding said side aprons apart.

4. An improved headwall comprising a back wall adapted to extend about a culvert pipe and be secured thereto, side aprons removably interlocked with said back wall, a bottom apron for spacing said side aprons in flaring position to avoid the disengagement of the interlocking connection with the back wall, and means for coupling said side aprons to said bottom apron.

5. An improved headwall comprising a cast back wall, cast side aprons interlocked with the headwall in divergent position, and a cast bottom apron for holding said side aprons in divergent position.

6. An improved headwall comprising a cast iron rear wall, cast iron side aprons interlocked with said back wall in the divergent position thereof, a cast iron bottom apron for holding said side aprons in divergent position, and cast iron releasable means for coupling said side aprons to the bottom apron.

7. A headwall comprising a perforated back wall, side aprons interlocked with said back wall, a bottom apron interlocked with said side aprons, and a lock ring engaging through the perforated back wall and interlocking therewith for securing said headwall to a culvert pipe.

8. An improved headwall comprising a perforated back wall, side aprons interlocked with said back wall, a bottom apron interlocked with said side aprons, and a flanged locking ring passing through the opening in the back wall with its flange engaging against the back wall, said ring adapted to engage about a culvert pipe.

9. An improved headwall comprising a perforated and slotted back wall, side aprons having interlocking wings projecting at substantially an acute angle therefrom for engaging in the slots of the back wall, a bottom apron coupled between said side aprons, and means engaging through said back wall for uniting the headwall to a culvert pipe.

10. An improved headwall comprising a back wall, side aprons coupled to said back wall and having lugs at their lower edges, and a bottom apron supported on the lugs of said side aprons.

11. An improved headwall comprising a back wall, side aprons secured to said back wall, and having lugs at their lower edges, a bottom apron engaged with said lugs for holding the side aprons apart, and means between said side aprons and the bottom apron for interlocking said aprons.

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