Dec. 17, 1929. E. R. ODEN 1,740,110

MEANS FOR SAFEGUARDING CONCRETE STRUCTURES AGAINST LEAKING FRACTURES

Filed Nov. 11, 1926

Fig. 1.

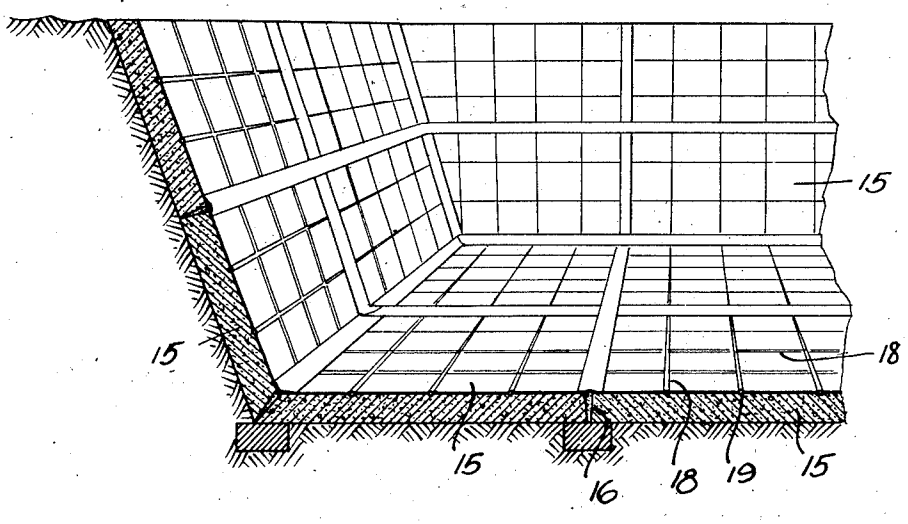


Fig. 2.

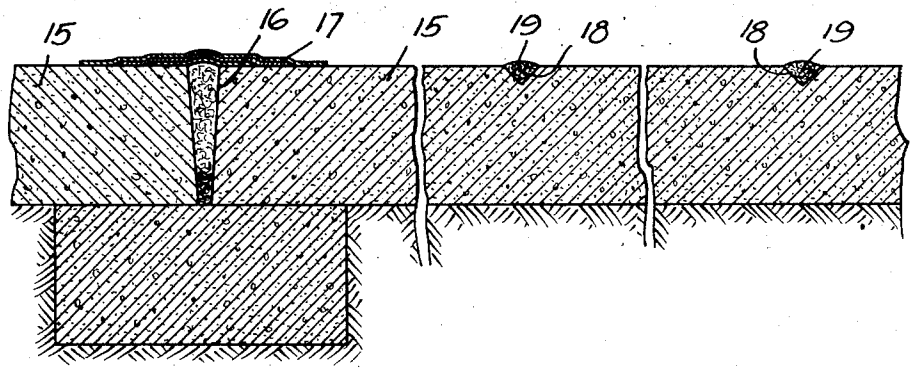
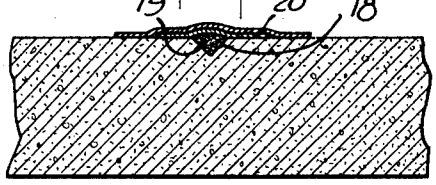


Fig. 3.



INVENTOR
EUGENE R. ODEN
BY Munn & Co.
ATTORNEY

Patented Dec. 17, 1929 1,740,110

UNITED STATES PATENT OFFICE

EUGENE R. ODEN, OF LANKERSHIM, CALIFORNIA

MEANS FOR SAFEGUARDING CONCRETE STRUCTURES AGAINST LEAKING FRACTURES

Application filed November 11, 1926. Serial No. 147,837.

My invention relates to concrete reservoirs and the like for storing water which as heretofore constructed are provided with many so called expansion joints which are cut through or extend through the entire thickness of the walls so as to divide the latter into slabs, the intended purpose of the cut through the joints being to minimize the possibility of fracture of the concrete by permitting the slabs to freely expand or contract. It is of course well known that the expansion joints are effective only to a small degree in the prevention of fractures, the joints in actual practice weakening the walls and thus increasing the possibility of fracture and leakage.

It is a purpose of my invention to provide a means by which the possibility of fracture is greatly minimized in any body or slab of concrete or similar material capable of fracture and in such manner that when fractures do occur they will be confined to predetermined paths and automatically sealed against leakage.

In carrying out my invention I course the surface of a concrete wall or slab at calculated points in a manner to form what I term false joints, false in the sense that the courses or grooves do not extend entirely completely through the wall or slab. By the provision of such false joints the wall or slab is weakened to a small degree at these points and to the extent of restricting any fractures which might occur to the false joints rather than at points between the latter. By filling the false joints with a suitable waterproof material it will be manifest that when a fracture does occur the filler will function to plug the crack and thus prevent passage of water thereinto. The filler material is preferably non-hardening in order that it may respond to the weight of the water contained in the reservoir to effectively seal the fracture against leakage. Further, the false joints may be spanned by laminations of a material which is flexible and waterproof, the flexibility of the material permitting it to respond to the weight of the water in forcing the filling material to the crack and yet protecting the filling material against the deteriorating action of water and the elements.

My invention is not limited in its adaptation to walls of concrete as it will be understood that it is adaptable with equal success to any material capable of being readily fractured, nor is it restricted to materials used for walls, as it can be applied to pavements and streets.

I will describe only two means of safeguarding concrete and similar structures against leaking fractures, and will then point out the novel features thereof in claims.

In the drawings

Figure 1 is a view showing in fragmentary sectional perspective a reservoir having incorporated therein one means of safeguarding the concrete walls thereof against leaking fractures;

Figure 2 is an enlarged fragmentary vertical sectional view of a portion of the bottom wall of the reservoir shown in Figure 1;

Figure 3 is a view similar to Figure 2, showing a modification of the means shown in Figures 1 and 2 for safeguarding the concrete walls of the reservoir against leaking fractures.

In Figure 1 I have shown a portion of a reservoir in which the side and bottom walls are constructed of slabs 15 of concrete or similar material, having expansion or contraction joints 16, preferably sealed against leakage by the means embodied in my copending application Serial No. 138,457, filed September 29, 1926. This joint sealing means includes a plurality of flexible membranes 17 superimposed and of graduated lengths.

In the upper or outer surfaces of the slabs grooves 18 are formed by coursing the concrete while in a plastic state, the grooves being preferably of V form in cross section and co-extensive in length or width with the slabs. In the present instance I have shown the grooves extending in two directions on each slab so that they intersect, the grooves extending in either direction being parallel and spaced from each other and form the edges of the slabs.

As shown in Figure 2 the grooves contain a filler 19 which is of suitable non-hardening

compound such as asphalt poured hot into the grooves. The filler 19 in each groove is substantially triangular in cross section its upper or outer surface being slightly convex so that the pressure of water thereon when the reservoir is filled will tend to force the filler inwardly of the groove, when a fracture occurs in the groove thereby operating to seal the fracture against leakage of water therethrough.

In Figure 3 I have shown two flexible membranes 20 overlying the groove and serving as a protection against deterioration of the filler by the elements so that its sealing property is preserved. The membranes being flexible allow the weight of the water to still function in pressing the filler into any fractures which may occur in the groove so as to seal the latter against leakage.

Although I have herein shown and described only two means of safeguarding concrete structures against leaking fractures, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention and the spirit and scope of the appended claims.

I claim:

1. In combination, a body of material capable of fracture having grooves in one surface thereof, a non-hardening waterproof filler for the grooves, and laminations of flexible material superimposed on the filler of each groove and bridging the groove.

2. In combination, a body of material capable of fracture and having a surface thereof grooved at intervals to form false joints for confining fracturing of the material to the joints, and a waterproof compound filling the grooves to prevent leakage of fractures at the false joints.

3. In combination, a body of material capable of fracture and having a surface thereof grooved at intervals to form false joints for confining fracturing of the material to the joints, a waterproof and non-hardening substance filling the grooves, and a member of flexible and waterproof material superimposed on said substance and spanning the edges of the grooves.

4. In combination, a body of material capable of fracture and having a surface thereof formed with intersecting grooves to provide false joints for confining fracturing of the material to the joints, and a waterproof compond filling the grooves to prevent leakage of fractures at the false joints.

5. In combination, a body of fracturable material having a surface groove therein, a non-hardening and waterproof filler in the groove, and a yieldable liquid proof covering for the groove.

EUGENE R. ODEN.