United States Patent

[11] **3,575,094**

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[73] Assignee **said Gary L. Timothy, assignor to said, Charles S. Hewitt**
Continuation-in-part of application Ser. No. 548;121, May 6, 1966, now abandoned.

[54] **EXPANSION JOINT WITH WATER LOCK**
2 Claims, 6 Drawing Figs.

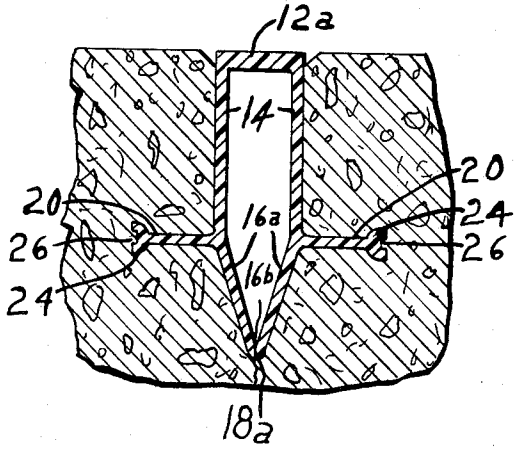
[52] **U.S. Cl.** **94/18**
[51] **Int. Cl.** **E01c 11/10**
[50] **Field of Search** 94/18

[56] **References Cited**
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ABSTRACT: An elongated hollow expansion joint for the concrete decking of swimming pools, the top of the joint being flat and the lower portions of the sidewalls converge to a point and form a V in cross section, the walls at the apex of the V being adapted to separate when joint is expanded by contraction of the decking. Lateral flanges project from the sidewalls intermediate their upper and lower edges, said flanges extending longitudinally of the joint and have grooved beads along their free longitudinal edges.



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2 Sheets-Sheet 1

Fig. 1.

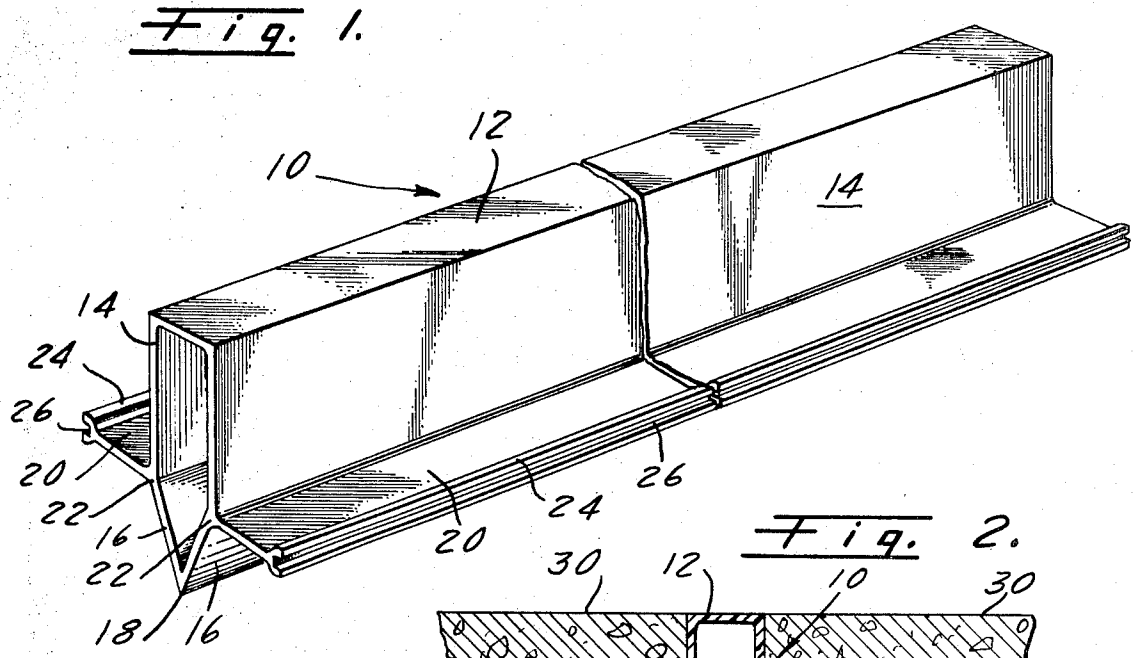
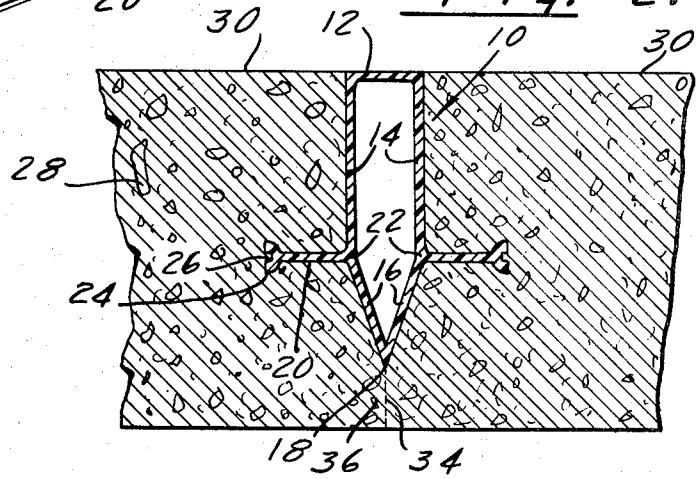


Fig. 2.



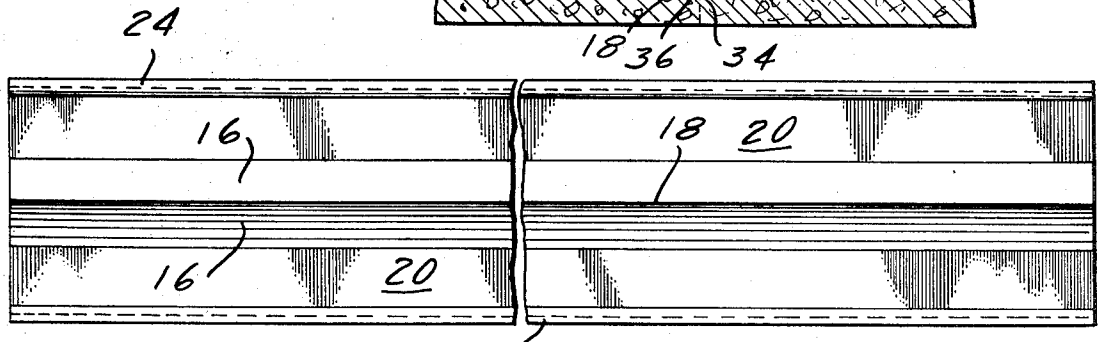


Fig. 3.

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Fig. 4.

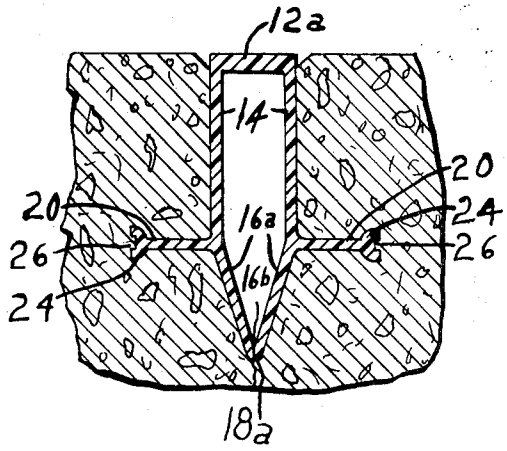
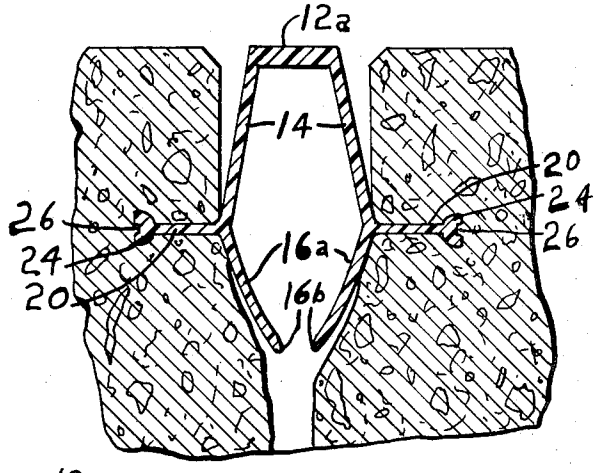


Fig. 5.



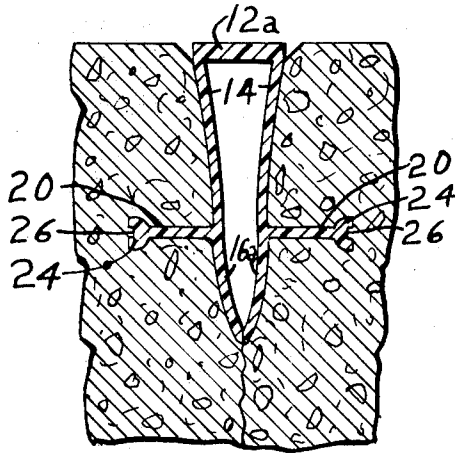


Fig. 6.

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EXPANSION JOINT WITH WATER LOCK

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of our copending application for EXPANSION JOINT WITH WATER LOCK, Ser. No. 548,121, filed May 6, 1966 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to the field of construction joints and relates more particularly to an expansion point with water lock for concrete slabs such as swimming pool decking and the like.

2. Description of the Prior Art

The prior art has various types of expansion joints. One type of expansion joint or top seal is that of the Harza U.S. Pat. No. 3,068,763. This is merely an expansion joint.

Another type of expansion joint is that of the Jacobson U.S. Pat. No. 2,619,884. This is also primarily an expansion joint.

Both these joints have anchoring keys at the sides, these keys becoming firmly and securely interlocked with the concrete to keep the joints in place.

One problem encountered with expansion joints for concrete decking for swimming pools and other concrete structures such as patio floors and the like is the difficulty of installing them.

Also there is a problem of sealing against the entrance of water past the expansion joint.

Expansion joints must accommodate wide variations in the expansion and contraction of the concrete construction in which they are installed and this presents a difficult problem.

Joints of this character must also be a permanent installation and must have a long effective life.

BRIEF SUMMARY OF THE INVENTION

The invention is an expansion joint and water lock for concrete slabs such as swimming pool decking, patio floors, and the like, and comprises an elongated tubular body having an upper portion or part and a lower portion or part. The upper part has a general cross-sectional shape of an inverted U while the bottom or lower part has the cross-sectional shape of a V. The upper edges of the sidewalls of the V-shaped part join the lower edges of the sidewalls of the upper part, these parts being integral, the joint or ridge at the junction or apex of the sidewalls of the V-shaped part is at the bottom and extends longitudinally of the joint. Intermediately of the top and bottom of the device there are oppositely arranged and extending lateral flanges running longitudinally along the exterior of the body, said flanges being integral with the other parts of the device.

Along the free edges of the flanges are enlargements or beads, each having a longitudinally extending groove at the outer side, said grooves being oppositely arranged and opening outwardly.

The device may be made of any suitable material such as plastic. It has been found that a relatively stiff but flexible plastic, that is a rigid plastic meets the various requirements. There are various types of plastic materials on the market having the required characteristics. One such material, by way of example, is A.B.S. or a rigid vinyl.

When formed the sidewalls of the V-shaped part are together but when installed and the concrete at the sides of the device contracts, the sidewalls of the V-shaped part are pulled apart at the apex. Thus, with this arrangement the device is easily installed in the concrete slab when the concrete is still soft by pushing it into this soft concrete with the sharp or pointed ridge leading.

However, as the concrete sets and shrinks or contracts the sidewalls of the device are separated at the apex of the V-shaped part and will freely flex to accommodate contraction and expansion of the concrete slab.

An object of the invention is the provision of an expansion joint and water lock for concrete slabs such as the decking of swimming pools, patio floors, sidewalks et cetera.

Another object of the invention is the provision of such a joint and water lock that when installed will expand and contract with contraction and expansion of the concrete formation at the sides of the joint.

Still another object of the invention is the provision of a joint of this character that has water lock means that will prevent water from passing down along the sides of the joint to the crack beneath the joint and leak through the concrete slab.

A further object of the invention is the provision of a joint of this character that is firmly and securely anchored in the concrete formation or slab portions at the sides thereof so as to respond to expansion and contraction of the concrete.

A still further object of the invention is the provision of a joint of this character that has its top wall at the surface of the concrete formation or slab and level or flush with said surface.

The characteristics and advantages of the invention are further sufficiently referred to in connection with the following detailed description of the accompanying drawings which represent one embodiment. After considering this example skilled persons will understand that many variations may be made without departing from the principles disclosed and we contemplate the employment of any structures, arrangements or modes of operation that are properly within the scope of the appended claims.

Referring to the drawings, which are for illustrative purposes only:

FIG. 1 is a perspective view of a length of the expansion joint and water lock embodying the present invention;

FIG. 2 is an enlarged cross-sectional view of the device shown embedded in the concrete decking of a swimming pool;

FIG. 3 is a bottom view of the device;

FIG. 4 is a cross-sectional view of an alternative arrangement of the device, showing it as initially installed in a concrete slab or decking;

FIG. 5 is a similar cross-sectional view showing the device expanded by the pull of contracted concrete at the sides thereof; and

FIG. 6 is a similar cross-sectional view with the device contracted as a result of the expansion of the concrete slab.

Referring more particularly to the drawings the joint comprises an integral, elongated tubular body, indicated generally at 10, having an upper portion in the general shape of an inverted U in cross section, said U having a substantially flat top wall 12 from the side edges of which depend sidewalls or arms 14 that are normal to the top wall and are normally substantially parallel with each other.

The body also has a lower portion the cross-sectional shape of a V, said V having sidewalls or arms 16 which join with the lower ends or edges of the arms 14. At the junction of the sidewalls 16 of the V-shaped bottom portion or part of the body is what will be termed a pointed tip or ridge 18. The respective sidewalls of the upper and lower parts comprise the sidewalls of the device.

There are oppositely arranged lateral flanges 20 which extend longitudinally of the joint from the junction 22 of the respective sidewalls of said lower portion of the body. Flanges 20 are integral with the body and are in substantially a common horizontal plane relative to each other and along the free edges, said flanges are provided with enlargements or beads 24.

There are oppositely arranged, longitudinally extending outwardly opening grooves 26 in said beads, said grooves being at the outer sides of the respective beads.

The device is installed by pressing it into the soft concrete and because of the pointed tip or ridge 18, installation is facilitated. Moreover concrete cannot enter the hollow interior of the device because the sidewalls are joined at the apex. When the device is pressed into the concrete slab 28 to a depth whereat the top surface of the top wall 12 is flush with the

upper surface 30 of the concrete slab the surface of the concrete is troweled to insure the upper surfaces of the top wall 12 and the concrete at the sides of the device are in the same plane.

Thus, as shown in FIG. 2, the top wall 12 of the body is flush or level with the upper surface 30 of the slab, the device including the flanges being embedded and securely anchored in the concrete, the concrete even filling the grooves 26. The beads, of course, prevent horizontal displacement of the flanges and secure said flanges in the concrete.

One or more of the joints are used, depending upon the installation requirements and said joints are installed before the concrete has set and while it is still soft. As the concrete dries and sets it shrinks and because the flanges are securely anchored in the concrete, the sidewalls 14 and the sidewalls 16 of the top and bottom portions of the device are pulled outwardly. In other words the device expands. As the concrete sets and shrinks a crack develops from the pointed tip or ridge 18 downwardly through the weakened portion 36 of the concrete slab, the position of the crack thus being controlled or determined by the joint.

With substantial expansion of the joint the sidewalls are pulled outwardly and because the relatively sharp interior angle of the sidewalls where they join each other at the apex the joint will crack along the tip or ridge 18 and the sidewalls will separate as shown in FIG. 5. This is inherent in the structure of the device. Thus great expansion of the joint is possible as is apparent in FIG. 5.

Expansion of the concrete will, of course, cause inward movement of the sidewalls 14 and 16 of the device. In other words, the device will contract.

Any water that might seep down the outer sides of the sidewalls 14 of the upper portion of the body will be stopped in its downward course by the flanges 20 and prevented from leaking through the crack 34 and into the ground.

Referring to FIGS. 4, 5 and 6, the device has a top wall 12*a*, sidewalls 14 of the inverted U-shaped top part, sidewalls 16*a* of the lower V-shaped part joined at the tip or apex or ridge 18*a* and flanges 20 along the sides with enlargements or beads 24 along the free edges of the flanges, the beads having outwardly opening grooves 26 therein. The top wall 12*a* is thicker than the sidewalls in this arrangement.

The sidewalls 16*a* are joined at the apex by a cold seal. That is, when extruded the free edges 16*b* of the walls 16*a* are brought into contact with each other and adhere so that the apex or ridge 18*a* of the V-shaped part is weak and the walls 16*a* will be pulled apart at their junction when the concrete in which the device has been installed shrinks or contracts. Any other means for providing a weak or weakened junction of the sidewalls 16*a* to facilitate separation or pulling apart of said sidewalls at their junction or the apex of the V-shaped part may be used.

In FIG. 5 the device is shown with the sidewalls 16*a* separated so that the sidewalls of the device will flex a maximum amount.

In FIG. 6 the device is shown under compression caused by the expansion of the concrete slab. This can be either after the sidewalls 16*a* have been pulled apart at the apex and along the ridge or after.

The invention and its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts of the invention without departing from the spirit and scope thereof or sacrificing its material advantages, the arrangement hereinbefore described being merely by way of example, and we do not wish to be restricted to the specific form shown or uses mentioned except as defined in the accompanying claims.

We claim:

1. In an integral expansion joint and water lock for installation in concrete slabs of decking for swimming pools and the like:

A. an elongated tubular body of stiff and rigid but flexible plastic material having:

a. an upper part in the generally cross-Sectional shape of an inverted U, there being a top wall substantially horizontal and flat at all times and adapted to be coplanar with the top surface of said decking, and sidewalls depending from the side edges of the top wall, said top wall being thicker than said sidewalls,

b. and a lower part V-shaped in cross section, the oppositely arranged sidewalls thereof depending from the lower edges of respective sidewalls of the upper part, the point of the V forming a longitudinally extending ridge which facilitates pressing and entry thereof into soft concrete and prevents concrete from entering the hollow interior of said body,

B. and oppositely arranged relatively wide lateral flanges extending longitudinally, continuously and integrally of the body, said flanges extending outwardly of the body and joining same, adjacent the upper end of said V-shaped part and enlarged beads on and extending along the free edges of said flanges for anchoring said flanges in the concrete, and outwardly opening grooves in the beads for reception of concrete when the expansion joint and water lock is installed in soft concrete so that the flanges and sidewalls of the upper and lower parts will be pulled laterally outward with contraction of the concrete upon setting thereof, the junction of the sidewalls of the lower part is weakened to facilitate separation of said sidewalls along the ridge with lateral pulling on the sidewalls during contraction of the concrete.

2. The invention defined by claim 1, wherein the sidewalls of the lower part are cold-sealed together to provide a weak connection thereof.