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Deason

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[54] **CONCRETE EXPANSION AND CONTRACTION JOINT**

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[51] **Int. Cl.²** **E01C 11/10**

[58] **Field of Search** 52/393, 396, 573, 403; 404/64, 65, 48, 68, 69

[56] **References Cited**

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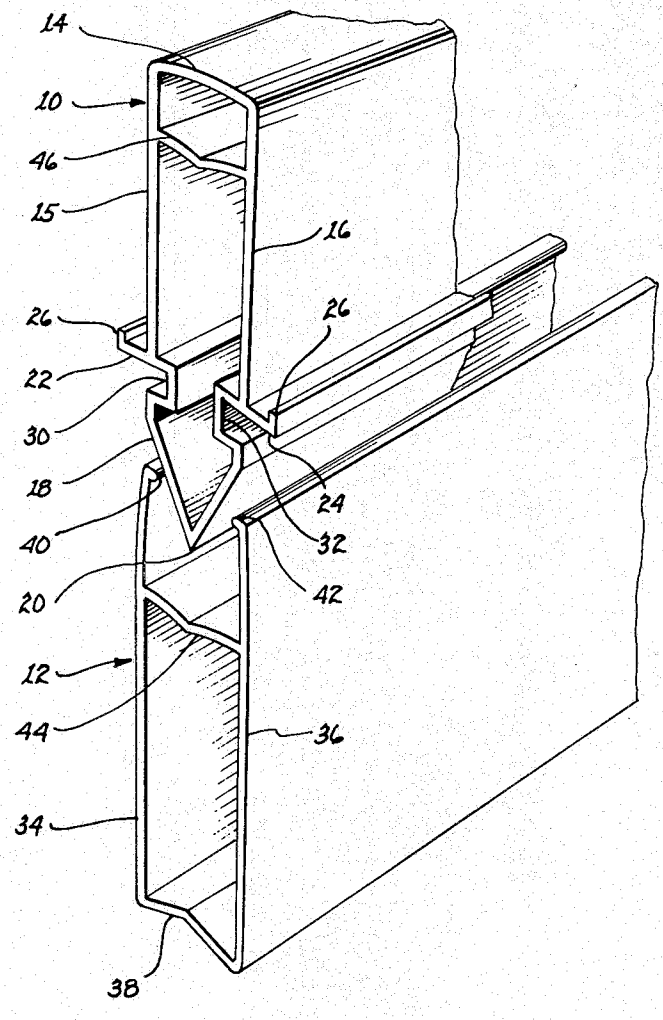
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[57] **ABSTRACT**

A concrete expansion and contraction joint is described incorporating an upper and lower section detachably engaged and including longitudinally extending water blocking anchors. The bottom wall of the upper section incorporates a V-shape having a contractual crack inducing edge; a pair of longitudinally extending channels are provided in the upper section beneath the water blocking anchors for receiving locking flanges positioned along the upper edges of the lower section. The flanges engage the channels to lock upper and lower sections into a unitary structure.

3 Claims, 2 Drawing Figures



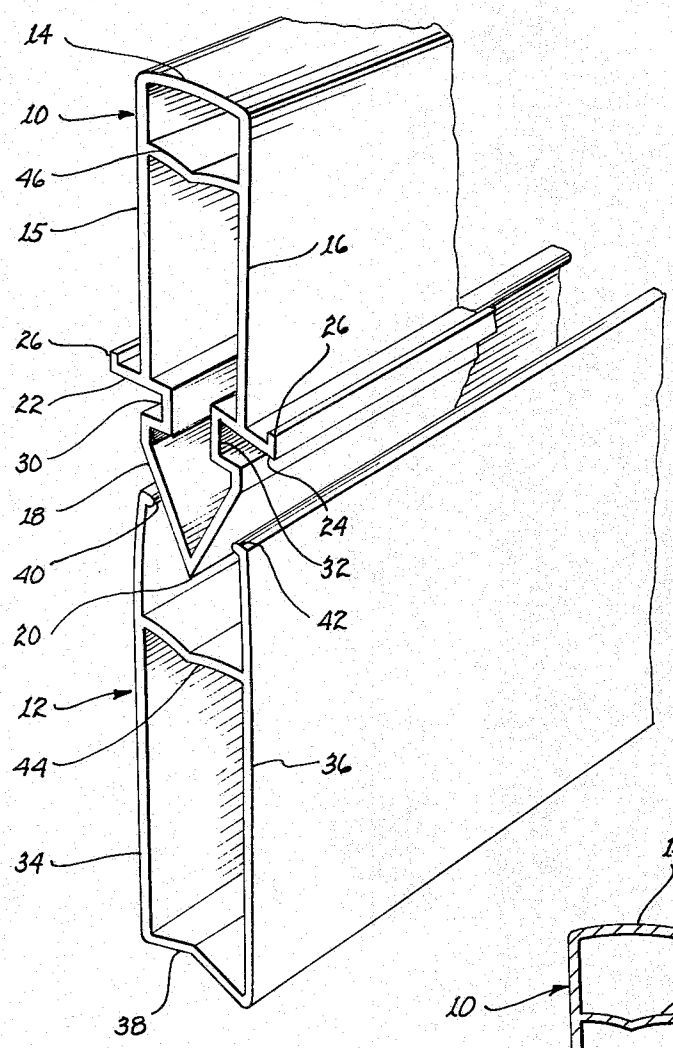

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fig. 1

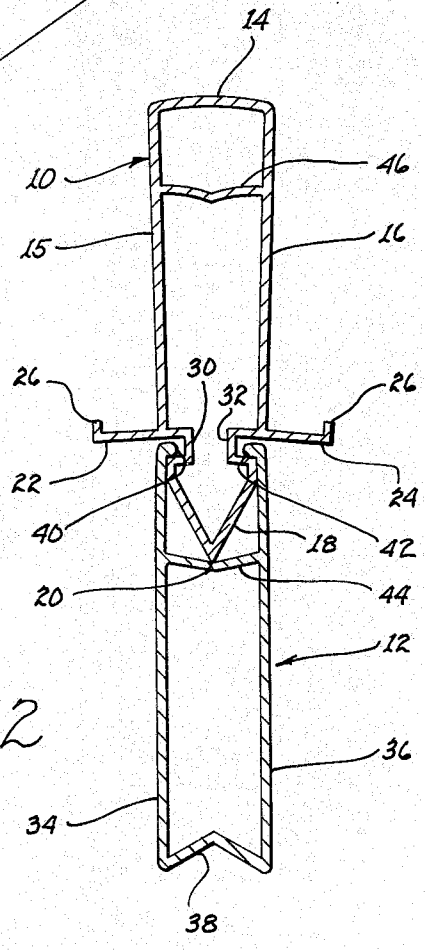

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fig. 2

CONCRETE EXPANSION AND CONTRACTION JOINT

The present invention pertains to concrete joint apparatus and more specifically, to a concrete joint to facilitate the proper positioning of a contraction crack in a concrete slab and for accommodating, when desired, the expansion of the concrete slab.

The expansion and contraction characteristics of concrete are well known; in those applications where a concrete slab is to be used for semi-decorative as well as functional purposes the inevitable contraction cracks are unsightly and in some instances dangerous. Specifically, when a concrete slab is to be utilized in the vicinity of swimming pools, it is important from an aesthetic point of view to control contraction cracks and to prevent water entering such cracks and travelling to the soil beneath the slab. Uncontrolled contraction cracks are not only unsightly in a swimming pool environment, but they permit water to travel therethrough to the soil beneath the slab which, under expansive soil conditions, may result in raised and uneven slabs and even possible additional cracking and unevenness.

To control such contraction cracks, a variety of joint configurations have been proposed in the prior art which will induce the slab to crack beneath the joint at a predetermined location with the joint covering the crack. In concrete slab environments such as swimming pools, it is frequently important not only to control contraction cracks, but also provide a means for accommodating slab expansion. To accommodate such expansion, the joint must extend the entire depth of the slab and be capable of withstanding the compressive forces exerted by the expanding concrete when the latter subsequently contracts.

It is therefore an object of the present invention to provide a concrete joint that may be utilized to accommodate contraction and expansion of a concrete slab.

It is another object of the present invention to provide a concrete joint that can be utilized to accommodate the contraction and ultimate cracking of a concrete slab while nevertheless optionally being capable of accommodating both the contraction and expansion of a concrete slab.

The present invention may be described with more clarity and specificity with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view, partly in section, of an expansion and contraction joint constructed in accordance with the teachings of the present invention with the upper and lower sections thereof separated; and

FIG. 2 is a cross-sectional view of an expansion and contraction joint constructed in accordance with the teachings of the present invention with the upper and lower sections thereof in the engaged position.

Referring now to the drawings, an expansion and contraction joint is shown having an upper section **10** and a lower section **12**. The upper section includes a top wall **14** and side walls **15** and **16**. The bottom wall **18** of the upper section **10** is formed into a V-shape having a contractional crack inducing edge **20** extending longitudinally of the upper section. It may be noted that the bottom wall **18** also acts as a guide for the flanges of the bottom section (to be described hereinafter).

Longitudinally extending water blocking wings or anchors **22** and **24** are provided on either side of the upper section **10** and extend outwardly from side walls **15** and **16**, repectively. These anchors **22** and **24** incorporate flanges **26** and **28** along the outside edges thereof which effectively lock the anchors into the concrete after it has solidified against either side of the joint. Longitudinally extending channels **30** and **32** are provided in each side of the upper section beneath the anchors **22** and **24**. The channels **30** and **32** are adapted to receive locking flanges (to be described) of the lower section **12**.

The lower section **12** includes side walls **34** and **36** and an inverted trough-shaped bottom **38**. The top of the lower section is open while the upper edges of the side walls **34** and **36** are provided with longitudinally extending inwardly directed locking flanges **40** and **42**. The flanges **40** and **42** engage the channels **30** and **32**, respectively, of the upper section thereby locking the upper and lower sections into a unitary structure. A trough shaped internal web **44** extends between walls **34** and **36** of the lower section while a trough shaped internal web **46** extends between the side walls **15** and **16** of the upper section.

The expansion and contraction joint of the present invention may be made from an extruded semi-rigid plastic that will conveniently provide sufficient rigidity and strength while affording limited flexibility to accommodate expansion and contraction of the adjacent concrete slabs. In use, when a concrete slab is being poured and only contraction crack control is desired, the upper section **10** is cut to an appropriate length and positioned in the fresh concrete usually just before or after tamping. The slab may be scored along the edges thereof adjacent the ends of the upper section after is has been positioned. The plastic concrete conforms to the side walls and bottom wall of the upper section **10** and flows around and completely encloses the anchors **22** and **24**. Subsequent contraction of the concrete results in the pulling of the wings **22** and **24** and slight deformation of the side walls **15** and **16**. The edge **20** produces a stress concentration directly beneath the upper portion to thereby induce the positioning of the contraction crack directly underneath the upper section. Water existing on the top of the concrete slab will tend to follow along the junction between the side walls **15** and **16** and the adjacent concrete; however, the anchors **22** and **24** form effective water blocks to prevent the water from seeping into the contraction crack directly beneath the upper section and possibly causing damage through the effects of expansive-type soils.

When pouring the concrete slab in an environment such as a swimming pool deck, it is appropriate to not only use contractual crack control, but at least periodically, provide expansion control as well. The operator, when desiring to provide such expansion control, mounts the lower section **12** to the upper section **10** by simply forcing the two together causing the side walls **34** and **36** of the lower **12** to "bow" slightly outwardly as the flanges **40** and **42** follow the contour of the V-shaped bottom **18** of the upper section **10**. As the flanges **40** and **42** slide upwardly along the bottom **18** to subsequently snap into the channels **30** and **32**, they provide a unitary structure having a total depth from the top wall **14** to the bottom wall **38**, of approximately the same depth as the concrete slab. The unitary structure comprising the upper and lower sections, may appropriately be positioned by any well known technique such as prestaking and then concrete is poured against

the sides thereof. The action of the joint is then, not crack positioning, but rather, preventing the occurrence of a contraction crack since it extends entirely through the slab. Further, water blockng is still provided by the anchors **22** and **24** (as well as locking the joint to adjacent slabs to cause slight expansion of the joint during contraction of the slabs). The expansion of the adjacent slabs is accommodated by the joint through the compressibility of the joint afforded by the inverted trough shaped bottom **38** and the trough shaped internal webs **44** and **46**. That is, the entire joint is sufficiently compressible to permit adjacent slabs to expand and is also sufficiently resilient to expand when the adjacent slabs contract.

It may therefore be seen that, the present invention provides a means for controlling contraction cracks while still permitting convenient adaptation of the joint to the control of expansion and contraction.

I claim:

1. A concrete expansion/contraction joint comprising:

a. an elongated upper section having a top wall and two side walls depending from said top wall;

b. a pair of water blocking anchors each extending outwardly from a side wall and longitudinally along said side wall; means forming longitudinally extending channels in each of said side walls beneath said water blocking anchors;

c. a bottom joining said side walls, said bottom including means for inducing a contractual crack; and

d. an elongated lower section having two side walls, a bottom wall and an open top; a pair of longitudinally extending inwardly directed locking flanges positioned adjacent said open top, engaging said longitudinally extending channels to lock said upper and lower sections together and enclosing said contractual crack inducing means to form a unitary structure; said upper and lower sections when embedded in concrete being inseparable.

2. The combination as set forth in claim **1** wherein said contractual crack inducing means is a longitudinally extending edge formed as part of a V-shaped bottom of said upper section.

3. The combination as set forth in claim **1** wherein said upper and lower sections each include longitudinally extending trough shaped internal webs extending from one side wall to the other to permit said joint to be compressed.

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