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Kaufman

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[54] **CHECK VALVE ARRANGEMENT FOR USE IN BOTTOMS OF SWIMMING POOLS**

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[51] **Int. Cl.** **E04h 3/16,** E04h 3/18

[58] **Field of Search** 4/172, 172.18, 172.19, 4/172.17; 210/169; 137/525.5

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Primary Examiner—Henry K. Artis

[57] **ABSTRACT**

A device for preventing floating of swimming pools by allowing ground water to enter the pool when the pressure thereof is greater than the pressure in the pool includes a conical member tapering upwardly set in the bottom wall of the pool and ending a slight distance below the upper face of the finished pool bottom. Above this conical member and having its upper edge flush with the finished bottom is a check valve arrangement which includes a ring set in the concrete and having an upwardly tapering portion which ends in a very thin upper edge flush with the upper face of the concrete and having a plug portion which is hollow and likewise has a very thin upper edge. These two parts have opposed seats which can engage an O-ring. The hollow plug is filled with concrete which is the same as that used in finishing the bottom of the pool so that the device is only slightly noticeable.

If ground water is present at a pressure greater than that of the water pressure in the pool, it will move upwardly through the cone and lift the plug valve so as to enter the pool.

4 Claims, 3 Drawing Figures

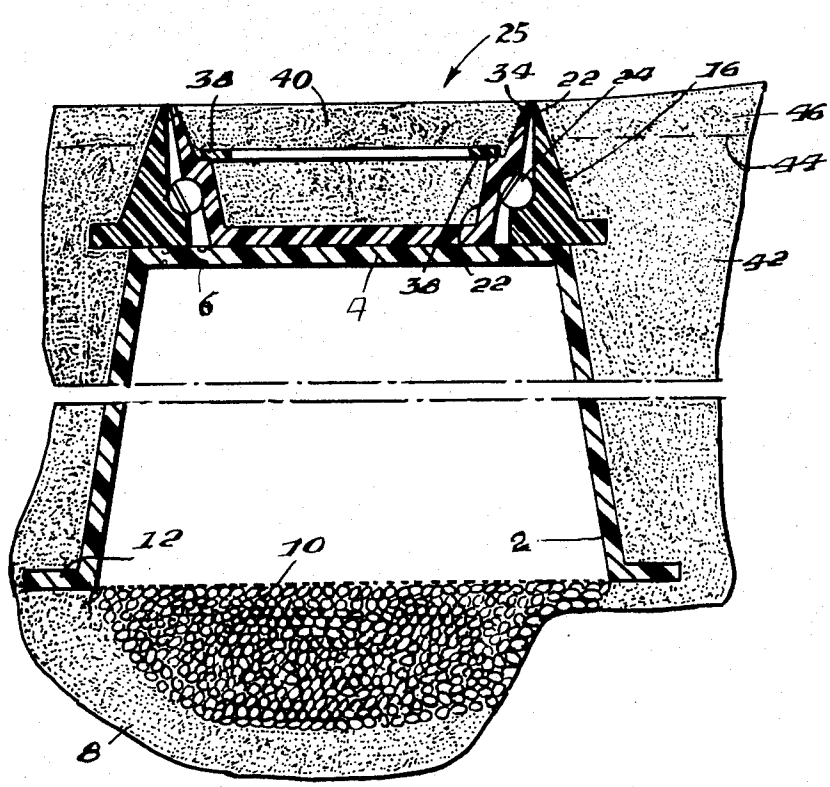


Fig. 1.

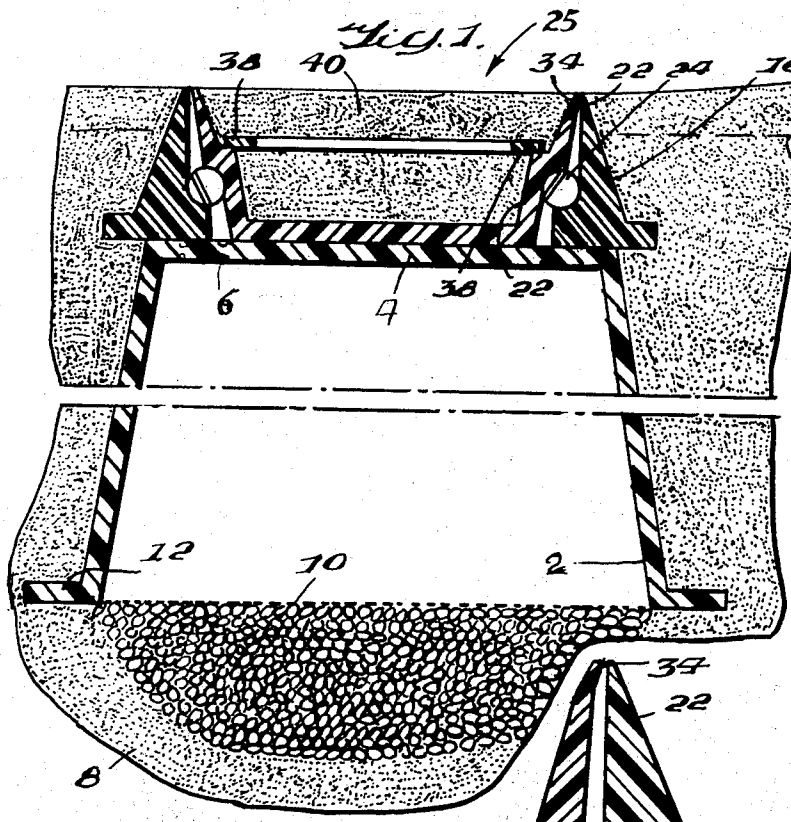


Fig. 2.

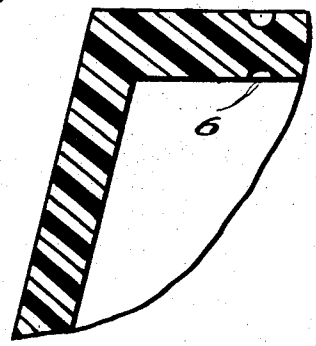
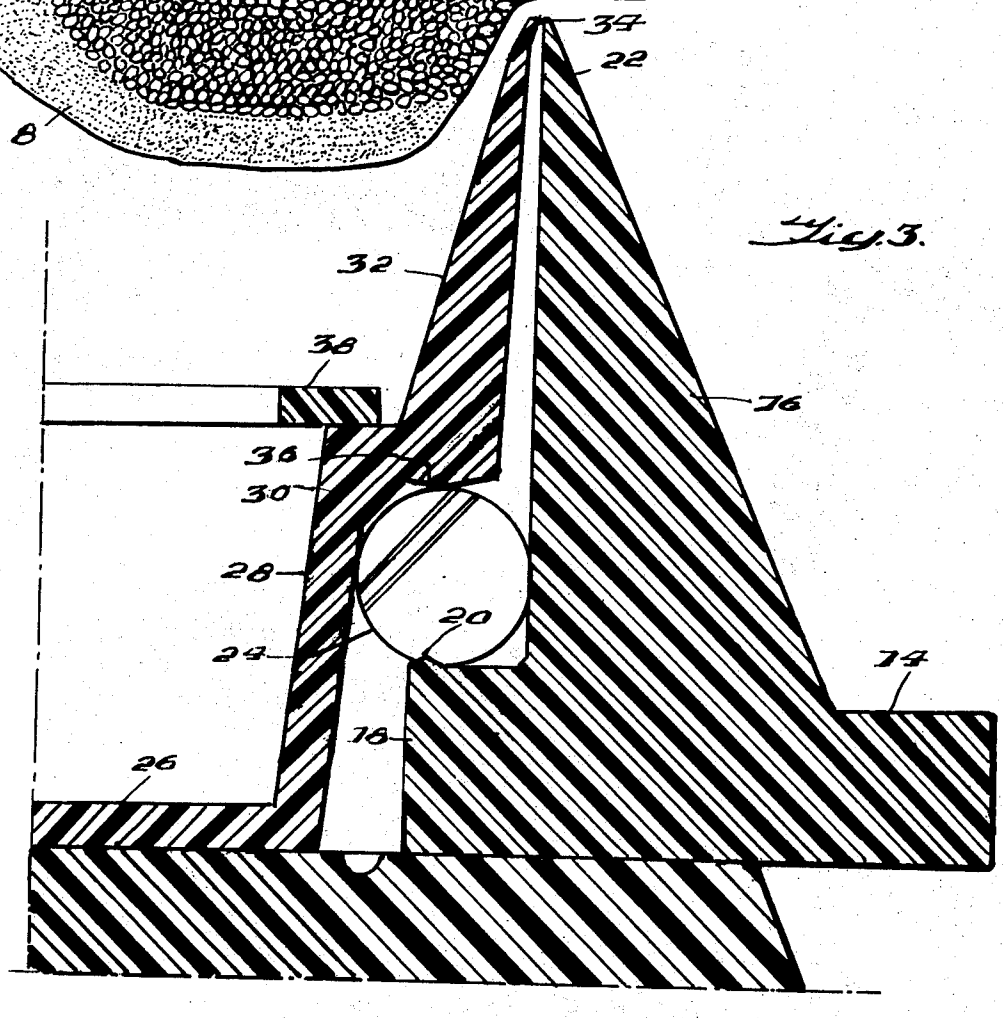


Fig. 3.



CHECK VALVE ARRANGEMENT FOR USE IN BOTTOMS OF SWIMMING POOLS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to check valve arrangements for the bottom of swimming pools for preventing floating of the pool by ground water.

2. The Prior Art

It has been known for many years that swimming pools are likely to float if they are emptied when there is substantial ground water around them. To avoid this, it has been known to place check valves in the bottom of the pool so that the ground water may enter the pool from below if its pressure exceeds that of the water in the pool. These arrangements have in general in the past been unsatisfactory because they are likely to be fouled by sand or gravel carried up by the ground water, which prevents them from reseating properly when the pool is filled. Likewise, some contractors in order to save expense and labor have omitted such check valves, even where they are required by law. This omission cannot be detected by an inspector after the pool has been filled, and often the owner does not know of the omission until for some reason the pool is emptied and floating takes place.

Applicant's company has had on the market for some time an improvement over this construction which utilizes an upwardly tapering cone of substantially 4 inches i.d., at its top with a type of plug valve guided in a seat and closing on an O-ring when the pressure in the pool exceeds that in the ground outside. Such an arrangement works quite satisfactorily to prevent fouling of the valve by sand, since the cone allows the upwardly coming ground water to move sufficiently slowly to allow the sand and grit to settle out of it, but it has been objectionable to many pool builders and owners because it is clearly visible in the bottom of the pool and seems to serve no useful function as the pool drain does.

Likewise, it has had the advantage that an inspector could tell even when the pool is full whether or not such a device had been installed.

SUMMARY OF THE INVENTION

The present invention provides an arrangement of the type described above which however is substantially unnoticeable, but the insertion or omission of which can readily be noted by an inspector.

According to the invention, above a conical member there is arranged a ring having an annular seat for an O-ring and an upwardly tapered annular part having a very thin upper edge, together with an upwardly open hollow plug with another annular seat cooperating with the O-ring and having its upper part tapering likewise to a thin edge. The hollow part of this plug can then be filled with concrete of the same mix as is being used in the finish coat on the bottom of the pool, so that at its interior will look like a part of the pool bottom. All that will be visible is the two thin rings formed by the upper edges of the plug and the seat member. These are hardly noticeable to the ordinary observer, yet they can be seen sufficiently so that an inspector will know that the device has been installed.

A further feature of the invention lies in the fact that the cone has a closed top end with grooves in its upper and lower faces, which prevents the entry of concrete mix or other material into the cone during the placing of the concrete, after which this wall can be readily cut away so as to leave the cone open.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. **1** shows in cross-section a device according to the invention installed in the bottom of a swimming pool;

FIG. **2** is a cross-section of the top part of the cone; and

FIG. **3** is a cross-section of the valve assembly.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, there is shown a cone **2** of plastic material which tapers upwardly and is closed at the top by a wall **4,** in the bottom and top parts of which are provided annular grooves **6.** The bottom wall of the cone is to rest on dirt **8.** A small amount of gravel **10** is placed below the bottom of the cone **2** which has a flange **12** which rests on the dirt.

Above the cone, but not directly attached to it, is a ring **14** having an upwardly extending portion **16** of tapering shape. The ring also has an inwardly extending flange **18** with an upwardly pointed rib **20** along its inner edge. The upper edge **22** of the part **16** is very thin, for example, as little as **15** one-thousandths of an inch.

An O-ring **24** of rubber rests on the annular rib **20.**

The plug **25,** which is movably mounted within the ring **14,** is an upwardly hollow annular body having a bottom **26,** an outwardly and upwardly sloping wall **28,** a transverse outwardly directed part **30** and another outwardly and upwardly sloping part **32** which also tapers to a very thin upper edge **34.** The outwardly directed part **30** has a downwardly directed annular rib **36** engageable with the O-ring **24.**

A flat ring **38** of plastic material is secured by a suitable adhesive on the upper inner face of the outwardly extending part **30.**

The parts **14,26,28** and **38** are all of plastic material.

In the installation of this arrangement, the cone **2** is placed on the dirt or other base beneath the pool, and the ring **14** with the plug **25** are placed resting on the cone. The main portion of the concrete **42** is then poured and rises to the point indicated by the broken line **44,** thus holding the ring **14** in position. The annular position of the ring **14** can be adjusted so that its upper edge is properly placed with relation to the level of the bottom of the pool. The finish layer **46** of concrete is then applied and is brought flush with the upper edge **22** of the ring **14.**

Meanwhile, the plug **25** is filled as indicated at **40** with concrete having the same mix as that of the finish layer of the pool, so as to have the appearance of being a continuation of the floor of the pool. This is also brought up flush to the upper edge **34.** The top wall **4** of the cone is now cut away, and removed, and the plug **25** is placed in position within the flange **16.**

With this arrangement there is only a very small area exposed of the parts constituting the plug valve, whereas on the other hand it is possible for these to be

seen by a careful inspection so that the inspector will know whether such equipment has been installed.

The cone substantially prevents the rising of sand or gravel through the device, so that choking or fouling of the valve is substantially prevented.

The ring **38** serves, when the plug **25** is filled with concrete, to prevent the concrete from dropping out if the plug is removed for any purpose.

If ground water is present at a pressure greater than that of the water pressure in the pool, it will move upwardly through the cone and lift the plug valve so as to enter the pool.

I claim:

1. A check valve arrangement for installation in the bottom of swimming pools comprising an annular member having an upwardly extending part with a thin upper edge and having an upwardly directed seating surface within such upwardly extending part, and an upwardly open hollow plug member having an upwardly extending part with a thin upper edge within and slightly spaced from the inner edge of the upwardly extending part of the annular member and having a downwardly directed seating surface opposite the seating surface of the ring, whereby when an O-ring is inserted between such parts it is engaged by the upwardly and downwardly directed seating surfaces and the upper edges of the two members are substantially at the same level, and whereby filling of the hollow plug with material of the same appearance as that used for the finish surface of the pool bottom will render the arrangement inconspicuous.

2. In combination with a valve arrangement as claimed in claim **1,** an upwardly tapering downwardly open cone having at its top an outer diameter greater than the interior diameter of said annular seat part.

3. An arrangement as claimed in claim **2,** in which said cone has a wall closing its upper end and lines of weakness around and adjacent the said outer edge of said wall to permit the cutting out of such wall after installation.

4. In a swimming pool having a concrete bottom resting on a base, an inwardly and upwardly open cone which tapers upwardly resting on such base and enclosed in the concrete, and a valve arrangement as claimed in claim **1** located above said cone and having the opening in said annular member in communication with the opening in the cone, and an O-ring between said seating surfaces, said upper edges of the two members being flush with the upper face of the pool bottom and said plug member being filled with concrete at least a top layer of which is of the same mix as that of such upper surface.

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