

Feb. 28, 1967

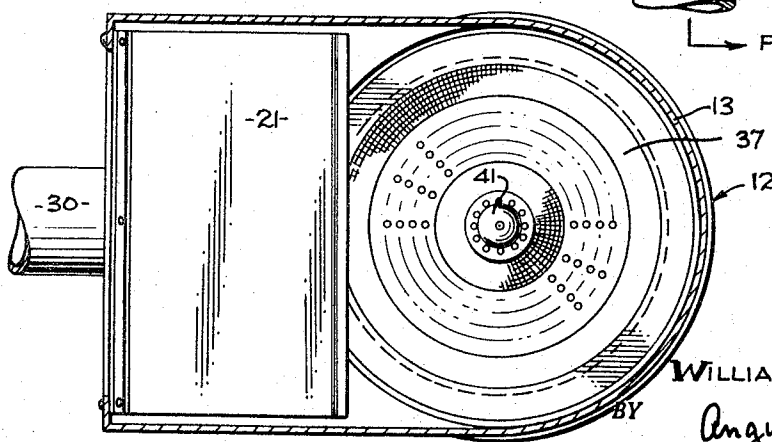
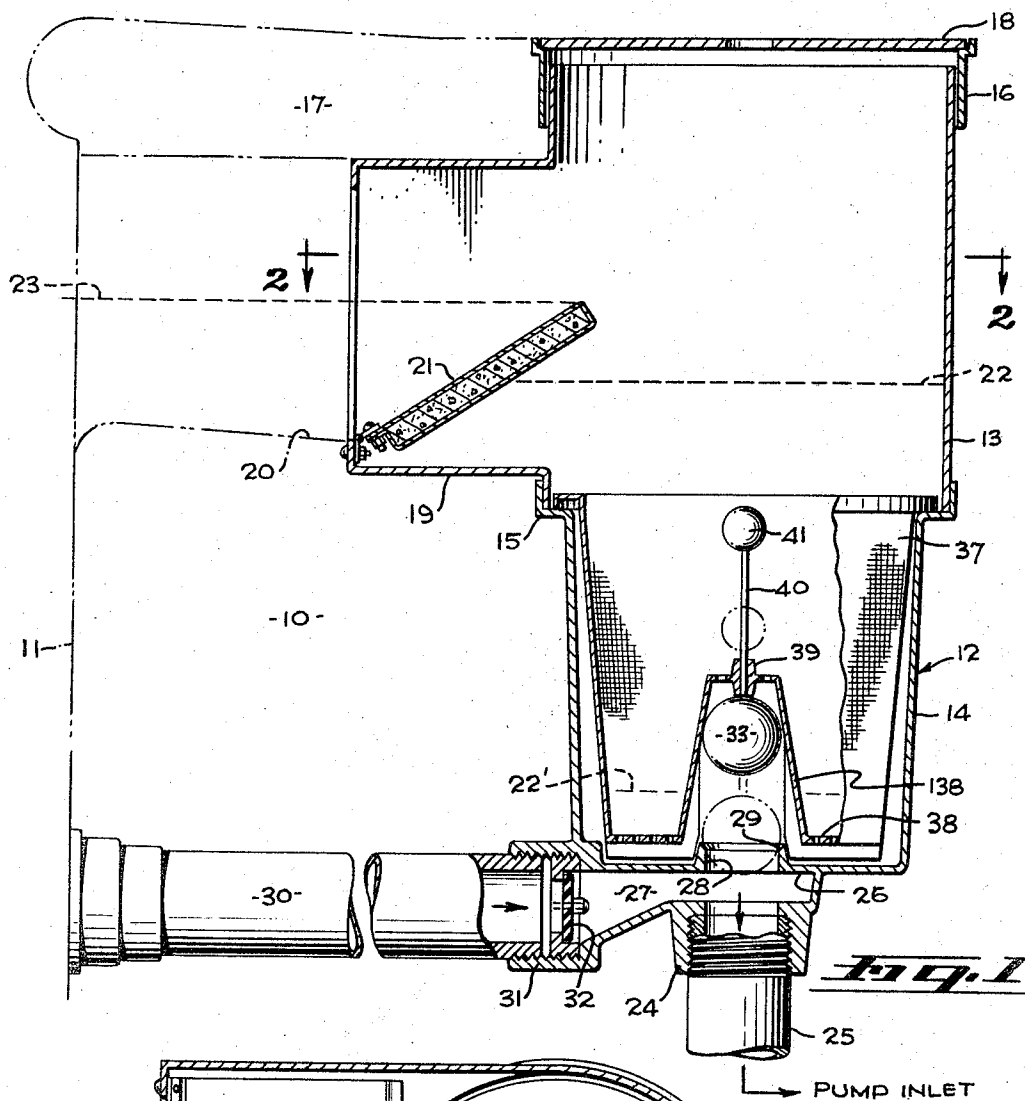
W. O. BAKER

3,306,448

AUTOMATIC SKIM TANK AND SYSTEM

Filed Feb. 9, 1966

4 Sheets-Sheet 1



INVENTOR.
WILLIAM O. BAKER

Angus + Mon

ATTORNEYS

Feb. 28, 1967

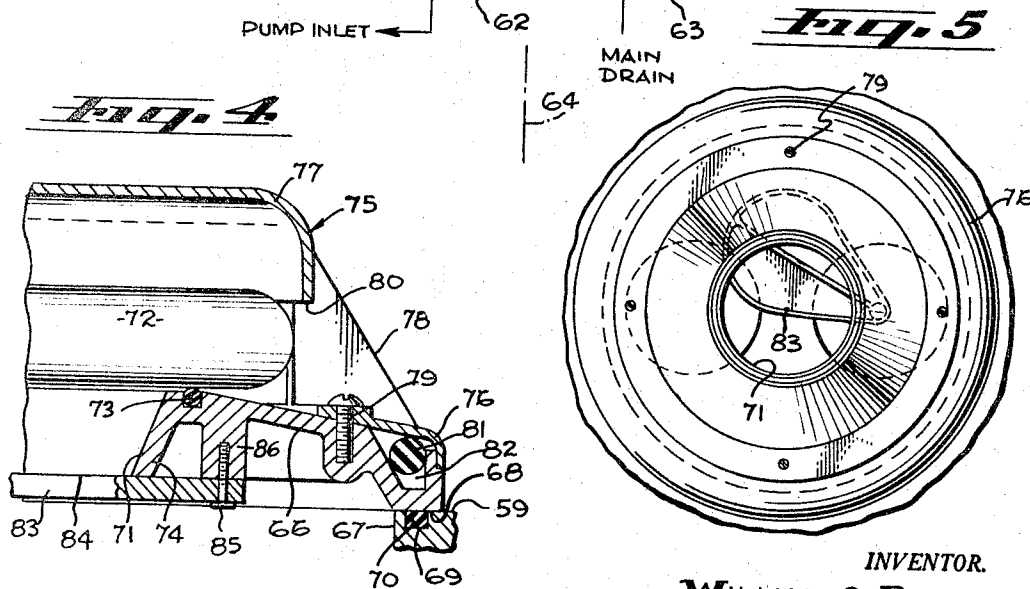
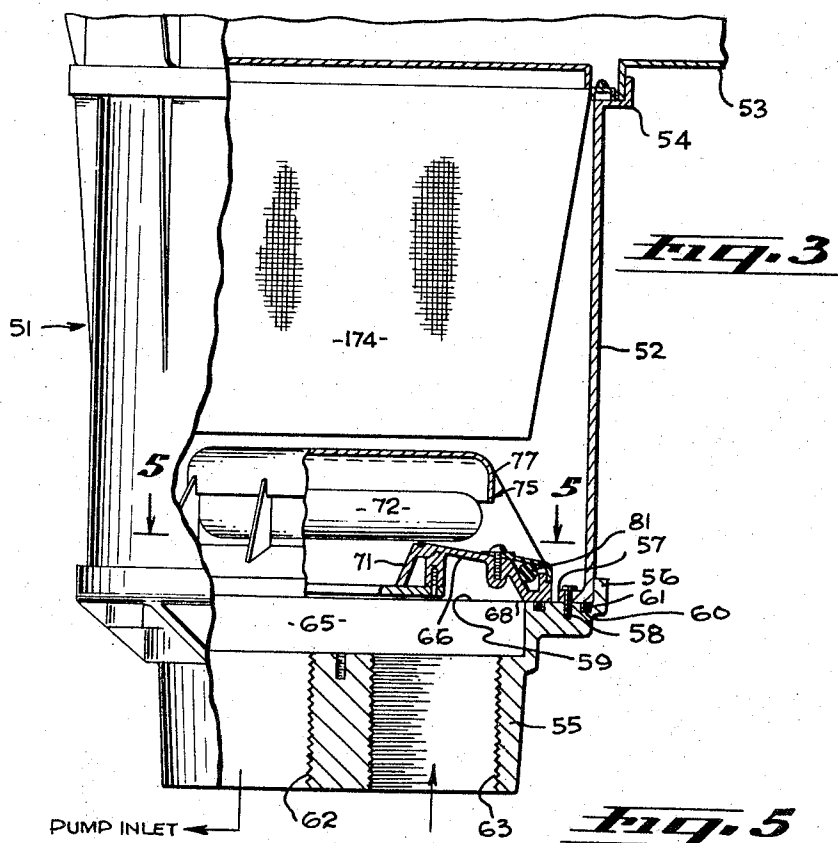
W. O. BAKER

3,306,448

AUTOMATIC SKIM TANK AND SYSTEM

Filed Feb. 9, 1966

4 Sheets-Sheet 2



INVENTOR.
WILLIAM O. BAKER

BY *Angus & Mon*

ATTORNEYS

Feb. 28, 1967

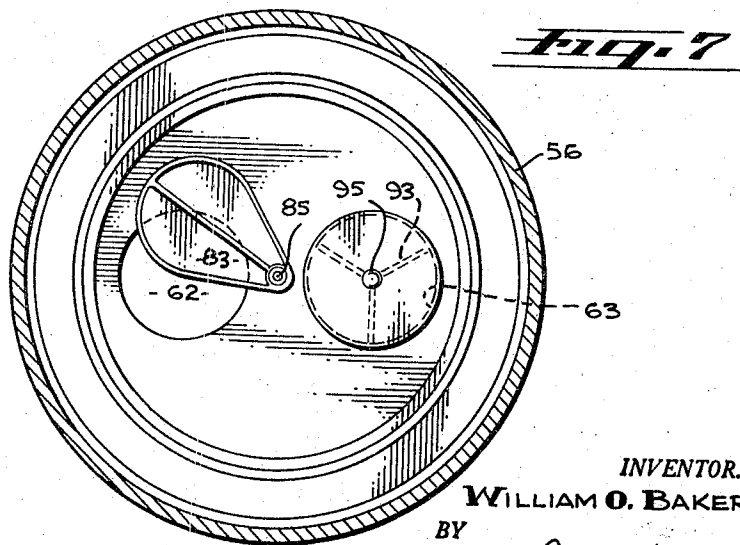
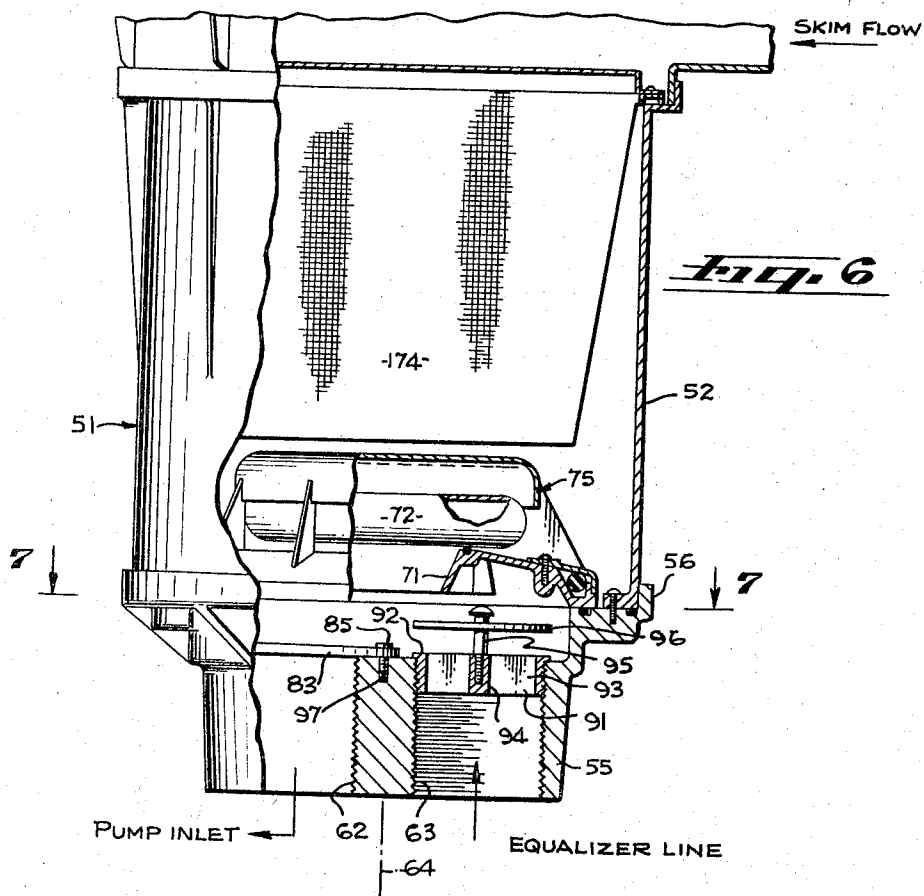
W. O. BAKER

3,306,448

AUTOMATIC SKIM TANK AND SYSTEM

Filed Feb. 9, 1966

4 Sheets-Sheet 3



INVENTOR.
WILLIAM O. BAKER
BY
Angus + Mon
ATTORNEYS

Feb. 28, 1967

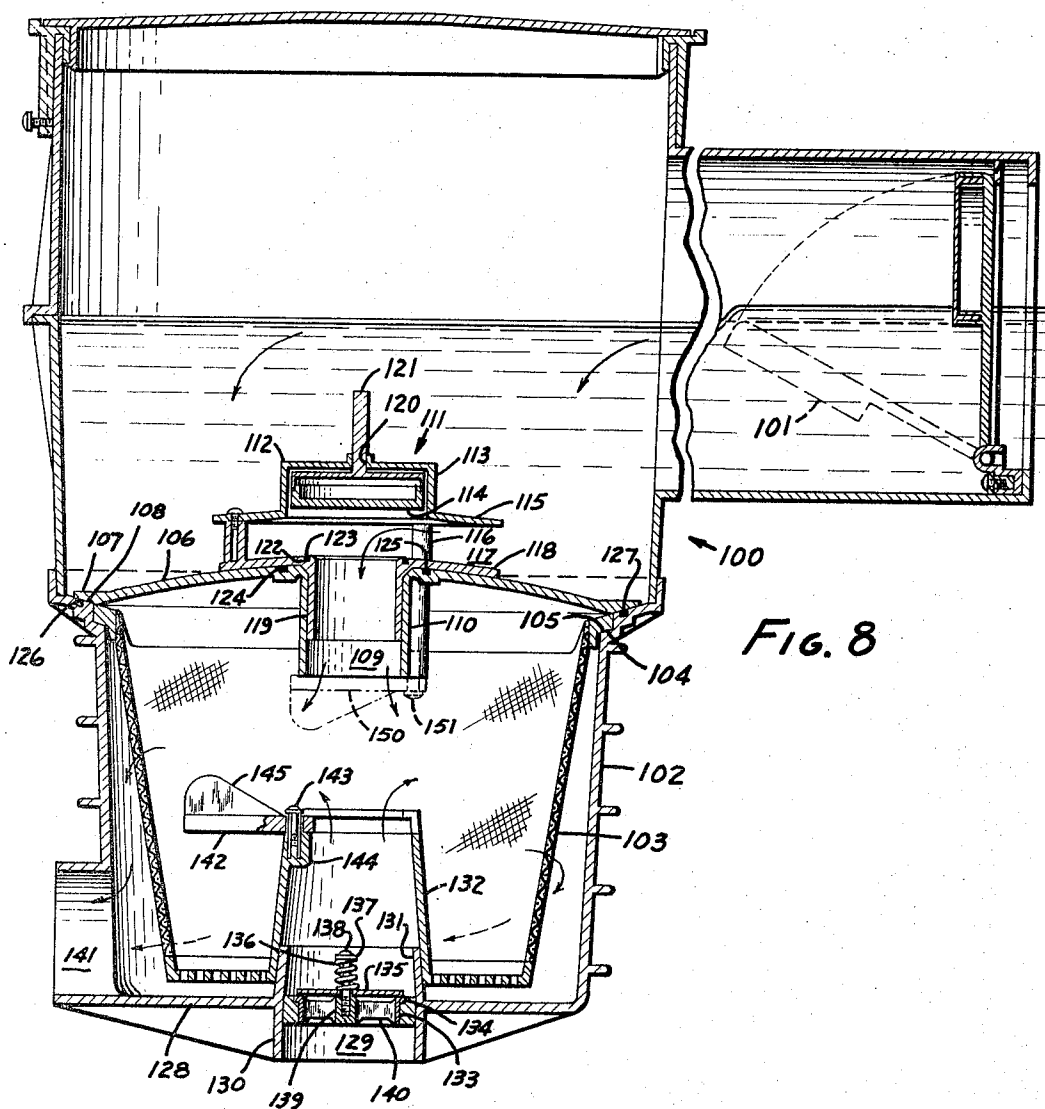
W. O. BAKER

3,306,448

AUTOMATIC SKIM TANK AND SYSTEM

Filed Feb. 9, 1966

4 Sheets-Sheet 4



INVENTOR
WILLIAM O. BAKER

BY
Angus & Mearns
ATTORNEYS.

1

3,306,448

AUTOMATIC SKIM TANK AND SYSTEM
William O. Baker, West Covina, Calif., assignor to
Swimquip, Inc., El Monte, Calif., a corporation of
California

Filed Feb. 9, 1966, Ser. No. 526,272

17 Claims. (Cl. 210-121)

This application is a continuation in part of my co-
pending application Serial Number 90,539 filed Feb. 20,
1961, now abandoned.

This invention relates to swimming pool equipment, and
particularly to skim tanks and associated equipment.

Proper cleaning of the water of the swimming pool de-
pends in large measure upon recirculating and filtering the
water drawn over a skimming ledge. The level of water
in the swimming pool, of course, cannot be maintained
constant. In order to maintain flow despite changes in the
height of the water in the swimming pool, floating weirs
have previously been devised.

In such organizations, the water passing over the skim-
ming weir is received in a separate tank which supplies the
inlet of the recirculation pump. The floating weir is
pivoted on a horizontal axis, and is responsive to the level
of water in the tank, and it operates to keep the level
constant for any given flow rate determined by the pump.

While this arrangement is operative throughout a sub-
stantial variation in the height of water in the pool, never-
theless there are limits to the range of operation of the
floating weir. Thus, the level in the swimming pool may
drop below the opening that feeds the weir, or so close to
the weir axis, that the weir can no longer increase flow
by lowering. In such circumstances, the tank will run
dry and the pump will suck air. Apart from possible
damage to the pump, this creates a nuisance as far as re-
starting the system is concerned.

In my copending application, Serial No. 790,629, filed
February 2, 1959, now Patent No. 3,067,879 I described
a skim tank that protects automatically against the pump
sucking air by closing a portion of the tank connected
to the pump inlet automatically in response to the cessa-
tion of skimming action. The suction thus created in the
tank portion in turn induces substantial bypass flow from
an equalizer line or from the main drain, as the case may
be, and the pump accordingly is protected. By deliberate
selection, the tank portion can be closed whatever the
conditions of the level in the swimming pool might be,
in order to create suction for inducing flow through a
vacuum line, for example.

The primary object of this invention is to provide an
improved automatic skim tank having the foregoing char-
acteristics.

Another object of this invention is to provide an auto-
matic skim tank in which the automatic means are dis-
posed between the bottom of the tank and a removable
basket designed to collect larger debris. Correspondingly,
it is an object of this invention to make possible, at least
in some forms of this invention, the removal of the basket
without in any manner disturbing the automatic means.

Still another object of this invention is to provide an
improved automatic skim tank having the foregoing char-
acteristics, in which the operative parts can be removed
for servicing, cleaning or replacement of parts simply by
lifting the assembly from the tank.

Another object of this invention is to provide an auto-
matic skim tank of this character that includes unique
provisions for balancing the flow among several skim
tanks operating in parallel.

Another object of this invention is to provide an im-
proved skim tank having unique means for balancing flow
as between a main drain which serves as the bypass to

2

the tank and the skimming ledge itself in situations where
the tank is used in typical residential installations for
such combined flows.

Still another object of this invention is to provide a
unique skim tank made largely of molded plastic material.

A further object is to provide a skim tank arrange-
ment having a strainer basket which collects debris located on
the part below the surface thereby relieving the debris
load at the pump.

This invention possesses many other advantages, and
has other objects which may be made more clearly appar-
ent from a consideration of several embodiments of the
invention. For this purpose, there are shown a few forms
in the drawings accompanying and forming part of the
present specification. These forms will now be described
in detail, illustrating the general principles of the inven-
tion; but it is to be understood that this detailed descrip-
tion is not to be taken in a limiting sense, since the scope
of the invention is best defined by the appended claims.

Referring to the drawings:

FIGURE 1 is a vertical sectional view of a skim tank
incorporating one form of the present invention shown
installed at a wall in a swimming pool;

FIG. 2 is a transverse sectional view taken along a plane
corresponding to line 2-2 of FIG. 1;

FIG. 3 is a fragmentary view of a modified skim tank
showing another embodiment of the present invention, a
portion of the tank being broken away and illustrated in
vertical section;

FIG. 4 is an enlarged fragmentary sectional view show-
ing a portion of the apparatus of FIG. 3;

FIG. 5 is a fragmentary sectional view taken along a
plane corresponding to line 5-5 of FIG. 3;

FIG. 6 is a view similar to FIG. 3, but illustrating a
modified arrangement for use of the tank in a commercial
type installation;

FIG. 7 is a transverse sectional view taken along a
plane indicated by line 7-7 of FIG. 6; and

FIG. 8 shows in cross-section another skim tank ar-
rangement according to this invention.

In FIG. 1 there is illustrated a swimming pool wall 10
having a vertical surface 11 exposed to the water in the
pool. The skim tank 12 is preferably imbedded adjacent
to or in the wall 10, and is adapted to receive water with-
drawn from the upper surface of the pool.

In the present example, the tank 12 comprises two
companion upper and lower hollow parts 13 and 14. The
lower tank part 14 has an upper opening defined by an
annular angle flange 15. The upper part has a lower open-
ing defined by circular walls received within the angle
flange 15.

The upper open end of the tank part 13 telescopes
within a frame 16 that is carefully set in the decking 17
adjoining the top of the swimming pool wall 10. A re-
movable cover 18 seated upon the frame 16 provides
access to the interior of the tank 12 as may be required.

The upper tank part 13 has an intermediate horizontally
extending branch 19 beneath the decking 17 and project-
ing toward the swimming pool surface 11. The branch 19
registers with an opening 20 in the swimming pool wall
10. Through the opening 20, the surface water of the
swimming pool may pass to the branch portion 19 and
thence to the tank 12 proper.

The branch portion 19 mounts a floating skimming
weir 21 that meters the flow of water into the tank in
accordance with the level of water 22 therein. As the
level 22 descends, the weir 21, in a well known manner,
drops, and the operative edge of the weir 21 is lowered
relative to the surface 23 in the main body of the swim-
ming pool.

The circulating pump (not shown) withdraws water

from the tank 12. For this purpose, the bottom of the lower tank portion 14 has a fitting 24 cooperable with a conduit 25 that leads to the pump inlet.

When the water level 22 in the tank drops significantly, a portion of the tank adjoining the fitting 24 must be sealed to prevent the pump from sucking air. For this purpose, the tank 12 has an integral partition 26 extending across the bottom of the tank. A separate chamber 27 is thus defined about the outlet 25. The chamber 27 has two sources of supply. One is the water flowing into the tank 12 over the skimming weir 21. Access is provided via an opening 28 in the partition wall. This opening 28 is surrounded by a raised valve seat 29 for purposes presently to appear. The second source of supply is an equalizer line 30 that extends from a fitting 31 in the bottom of the tank 12 to the wall surface 11. Communication between the equalizer line 30 and the chamber 27 is normally closed by a check valve 32 of any suitable form, and that requires a predetermined pressure differential to cause it to open. The equalizer line 30 opens in the swimming pool wall 11 at a place normally substantially below the lowest usual level of the water in the swimming pool.

A buoyant ball closure 33 above the seat 29 may close the opening 28, but only if the level 22 drops critically. Hence the chamber 27 is normally supplied by the water passing over the weir 21.

A removable basket 37 having a rim resting on the angle flange 15 provides a guide properly positioning the ball closure 33 for cooperation with seat 29 should the level 22 drop critically. Thus the bottom of the basket 38 has an inwardly or upwardly offset portion 138 that defines a cage above the seat 29 and within which the ball 33 can reciprocate. Normally the ball 33 rises to the top of the cage. At the top center of the cage is an apertured boss 39 which guides a stem 40 attached to the ball 33.

Should the water drop substantially below the level 22, and say, to the level 22' the weir 21 has obviously lost control, and the tank is about to be emptied. The ball 33 will drop in place before the level reaches the seat 29, and the opening 28 will be sealed before any air enters the chamber 27. The pump suction will maintain the ball 33 seated, and at the same time will open the equalizer line 30 by exerting the requisite force upon the check valve 32. The pump is now supplied entirely by the equalizer line 30, and the demands of the pump are met.

It is also possible to use the equalizer line 30 for attachment of a vacuum cleaner. In such circumstances, it would, of course, be necessary to close the opening 28 into the chamber 27, even if the level 22 is high. For this purpose, the closure 33 can be pushed toward the seat. To accomplish this, the stem 40 has a handle 41 accessible upon opening the cover 18. When the closure 33 is pushed against the seat 29, the pump suction, of course, maintains it in such position. Optionally, the closure 33 may be caused to engage the seat 29 by starving the tank 12. This can be accomplished by manually tilting the weir 21 upwardly so as to cut off flow into the tank. The closure 33 will then seat in the manner previously described.

In order to restore normal operation, the pump must be shut down. The closure 33 will then pop up if there is adequate water in the tank 12. The pump can then be restarted.

In the form illustrated in FIG. 3, the tank 51, made largely of plastic, is provided. The tank comprises three parts, two of them, 52 and 53, being of molded plastic material. As in the previous form, the lower tank part 52 has an annular angle flange 54 receiving the lower end of the upper tank part 53. The parts are welded together in an appropriate manner.

The lower tank part 52 also has an opening at its lower end for cooperation with a manifold 55 that forms the

third part of the tank. The manifold 55 is generally circular, having an upwardly extending peripheral flange 56 that receives the lower end of the body part 52. The lower end of the body part 52 has an inwardly directed annular flange 57 which may be regarded as the bottom wall of the tank. A series of screws 58 cooperable with threaded openings in the upper surface 59 of the manifold 55 serve to attach the flange 57 to the manifold 55.

In order to provide a seal between the parts 52 and 55, an O-ring is provided that is accommodated in a groove 61 at the base of the flange 56. The screws 58 are located just inwardly of the O-ring 61 and accordingly serve to clamp the lower surface of the flange 57 against the O-ring 60 to establish an effective seal.

The manifold 55 has two through openings 62 and 63 located on diametrically opposite sides of the manifold axis 64. Both are threaded. The opening 62 may cooperate with a conduit (not shown) leading to the pump inlet for the system, and the opening 63 may cooperate, for example, with a conduit leading to the main drain from the swimming pool, for the use in a residential type installation.

A circular valve body 66 rests upon the upper manifold surface 59 and fits with slight clearance into the circular space defined by the inner edge of the tank part flange 57. A shallow circular recess 67 extending inwardly from the manifold surface 59 defines, with the valve body 66, a chamber 65 corresponding to the chamber 27 of the previous form.

The valve body 66 has its rim provided with a flat undersurface 68 which contacts the manifold surface 59 about the edges of the recess 67. An O-ring 69 accommodated in a circular groove 70 surrounding the recess 67 is engaged by the undersurface 68 to establish a seal.

The center of the valve body 66 is raised to form a seat about a large central opening 71 that establishes communication between the tank part 52 and the chamber 65. The opening 71 is controlled by a generally flat circular hollow plastic float 72. The undersurface of the float 72 annularly engages an O-ring 73 accommodated in an upwardly extending groove about the opening 71. When the float is spaced above the seat, water entering the tank 51 from above can pass over the seat 73 and into the opening 71. A frustoconical integral flange 74 guides the water into the chamber 65.

The float 72 is confined and guided independently of a removable basket 174 which is suspended in the lower tank part 52 above the float 72. For this purpose, a cage 75 is provided. The cage 75 is a unitary molded plastic article including a base ring 76, inverted central dome 77, and vertical radially oriented buttresses or ribs 78 located equiangularly about the base ring 76 and supporting the dome 77 in spaced juxtaposed relationship above the base ring 76.

The base ring 76 fits the outer marginal portion of the valve body 66 and is attached thereto by a series of screws 79. The screws 79 are located generally at the inner area of the base ring 76.

Water can flow to the opening 71 between the generally annular clearance space between the lower edge of the dome 77 and the base ring 76, and past the thin radially oriented ribs 78.

The dome 77 is of such size as to receive the float 72 when the float 72 moves upwardly in response to buoyant forces. The dome 77 furthermore reserves to confine the float 72 against lateral movement. The spacing of the dome 77 is such that its lower annular edge 80 projects downwardly partially over the float 72 even when the float is seated to ensure that the float is confined.

The peripheral portion of the float 72 is curved, or otherwise converges inwardly at its upper portion so that, upon any misalignment between the float 72 and the dome 77, is automatically corrected by engagement with the lower dome edge 80.

In order to counteract the buoyancy of the float 72, and

5

to maintain the valve body 66 seated against the sealing ring 69, a lead ballast ring 81 is provided. The ballast ring 81 is conveniently confined in an annular space 82 defined between interfitting peripheral parts of the base ring 76 and the anchor body 66.

The float 72, cage 75 and valve body 66 are not disturbed by removal and replacement of the strainer basket 174. However, if necessary to clean, replace or otherwise repair the parts of the structure, the parts can be removed as a unit simply by lifting them out through the access opening (not shown).

In operation, the float 72 automatically seals the chamber 65 and causes the pump inlet 62 to draw all of its charge from the main drain via inlet 63. The seat 73 is engaged due to pump suction before the level of water drops to the level of the seat. By shutting down the pump, the float 72 pops upwardly, and normal operation is restored if the water level is adequate. If it is desired deliberately to close the chamber 65, the floating weir can be manipulated to starve the tank 52.

In the present example, the relative flow between the main drain at the opening 63 and flow from the skimming ledge and into the top of the tank 51 may be determined by a flap 83. The flap 83, FIG. 4 cooperates with the lower edge 84 of the center flange 74. The flap 83 is pivotally mounted upon a screw 85 fastened to the undersurface of an embossment 86 on the underside of the body 66. In FIG. 5 the flap 83 reduces the size of the opening 71 by approximately fifty percent and the relative flow through the opening 71 and 63 is accordingly controlled.

In the form shown in FIGS. 6 and 7, parts identical to those shown in FIGS. 3 to 5 are illustrated. In the present example, however, the tank 51 is adapted for use in a commercial type operation in which main drain flow is handled independently. The tank may be one of several operating in parallel from a single pump.

In order to provide bypass into the chamber 65 when the float 72 seats, the opening 63 is connected to an equalizer line similar to that illustrated in the form of FIG. 1. The equalizer line is normally closed by a check valve that is accessible on the inside of the tank.

The check valve includes a metal body 91 that is threaded into the upper end of opening 63 until its flange 92 engages the edges about the end of the opening 63. The body has webs 93 extending to a central hub 94 which in turn supports an upwardly extending guide post 95. A disk closure, made of lead, is guided on the post 95 and normally engages the body flange 92 to close the equalizer line.

In order to adjust pump suction at each tank so as to achieve desired flow among several parallel tanks, the flap 83 is now used as a throttle valve at the opening 62 to the pump inlet. The mounting screw 85 now engages a threaded aperture 97 at the bottom of the manifold recess 67 and between the openings 62 and 63.

As shown in FIG. 7, the flap 83 can be moved angularly so as to cover the opening 62 by an amount adequate to achieve the desired flow.

FIG. 8 shows another skim tank arrangement according to this invention. In this arrangement, the flow from the main outlet of the pool is directed into the skimmer basket thereby reducing the load on the strainer basket which is ordinarily located at the pool pump. The skim tank 100 is provided with a pivoted floating weir 101 at the entrance to the skim tank, as in above described embodiments and the lower housing portion 102 of the tank providing a chamber below the skim tank, has fitted into it a strainer basket 103 provided with an upper circumferential rim having a flange 104 which rests upon an annular shoulder 105 of the lower chamber portion 102. A partition or suction cover 106 overlies the basket by being rested at its circumferential portion 107 on an annular shoulder 108 of member 102, this shoulder forming the bottom wall of the skim tank, just upward and

6

outward of the shoulder 105. The central portion of the cover 106 is provided with an opening 109 forming the cover into a downwardly depending cylinder 110. There is fitted within the downwardly depending cylinder

5 110 a float cage 111 having a roof portion 112 with a cylindrical side wall 113 forming a cage for a float 114 within it and provided with an outwardly flaring portion 115 provided with a number of upright supports 116 spaced apart around the circumference of member 115 and providing spaces 117 through which water can flow into the interior of the cage and down into the strainer basket. The upright supports 116 are mounted on a base member 118 conforming to the shape of the cover 106 and resting upon the cover. At its central region, the plate 118 is formed into a downwardly depending cylinder 119 which fits into the cylinder 110 of the cover plate. The central area of the roof 112 of the cage is provided with an opening 120 of a size to accommodate a vertical stem 121 attached and protruding upwardly from the float 114 so that the float can move up and down within the cage.

At the top of the support plate there is a concentric annular groove 122 provided with a suitable O-ring 123 acting as a valve seat on which the flat bottom of the float member 114 rests when the float is in its lowest position. In the interest of minimizing undesirable leakage the suction cover plate 106 is provided with a concentric angular groove 124 into which there is fitted an O-ring 125; and the shoulder 108 of the member 102 is similarly provided with an angular groove 126 into which there is fitted an O-ring 127 on which the rim 107 of the cover plate rests. The chamber 102 is closed at the bottom by a floor member 128 excepting for an opening 129 formed by a centrally located cylindrical member 130, the upper portion 131 of which is frusto-conical and extends inwardly into the tank above the floor and tapers toward the central vertical axis somewhat to receive a re-entrant portion 132 of the basket 103 made of a frusto-conical solid tube which fits over frusto-conical member 131.

At one side of the bottom of the chamber there is provided an opening 141 which may be provided with threads or other suitable means for attachment to a conduit leading to the usual suction pump for the pool. The central opening 130 is adapted to be connected to a conduit leading from the main outlet of the pool.

The inlet 130 into the chamber 102 is preferably provided with a metering arrangement in the form of a shut-off valve 142 pivoted on a pivot pin 143 mounted in a boss 144 at one side of the upper part of member 132, the shut off valve being a flat member which may be rotated by means of its hand grip 145 from the open position shown in the figure to a closed position in which it will close the upper end of tube 132.

For commercial and semicommercial pools there is preferably incorporated into the system a spring-loaded check valve which will function in the case of low water in the pool. This is arranged as follows:

Within the lower cylinder 130 there is fastened a fitting in the form of a pipe nipple 133 held by suitable webs to member 130, the upper rim of which is provided with a flange 134 acting as a seat for a check valve member 135 in the form of a flat disc loaded by a spring 136 compressed between the upper surface of the disc 135 and a washer 137 held by a bolt head 138, the bolt of which is threaded into a central boss 139 held by a suitable spider 140 to the member 133. This will function only in the case of a low water condition. Thus when the pool water is so low as to drop the float 116 the suction of the pool pump at opening 141 will open the check valve to supply the necessary amount of water to supply the demand of the pump.

Likewise, in the case of pools having more than one surface skimmer, such as are commonly used in commercial and semicommercial pools, a shut off valve 150

pivoted on a pivot 151 similar to the arrangement of shut-off valve 142 will be placed at the lower end of the cylinder 110 of the suction cover. This can be adjusted to any desired degree of opening or closure of the valve and can be used to regulate the relative flow through the skimmer as compared to the flow through the other skimmers in the pool when the water drawn through all the skimmers is drawn into a common suction header by the pool pump.

The arrangement shown in FIG. 8 may readily be assembled by setting the member 132 of the basket in the position shown in registration with member 131 and then resting cover plate 106 on its shoulder and fitting the float cage with its float into position within cylinder 110.

The flow arrows in the figure indicate the flow during normal skimming operation such as is normally experienced in residential type pools. The flow from the main outlet of the pool is directed upward into the basket (when the spring loaded check valve 135 is open) and then through the side of the basket, which strains out the debris into the outlet 141 to the pump. Thus any debris from the main pool outlet is retained in the basket 103 and this avoids loading the pump strainer.

In case of a low water condition at the float 14, this float will drop, shutting off the flow of water from the upper chamber where the weir 101 is located, and preventing air from getting into the system below the suction cover 106. The suction from the pump will then cause the water required for maintenance of the pump operation to be supplied through the main outlet connection 130.

When it is desired to vacuum the pool for cleaning its surfaces, the float cage assembly 111 can be removed from the suction cover and the shut-off valve 142 is moved to place it over the port at member 132, allowing all the flow to occur through the opening 109 in the suction cover. The cylindrical cuff of the ordinary vacuum hose, which will have a dimension similar to that of member 119, will then be fitted into the member 110, the vacuum hose itself being led from member 110 out through the skimmer box past the weir 101 into the pool, so that the water drawn out of the pool through the vacuum hose during the vacuuming operation will then pass down through opening 109 into the basket which will catch any debris.

What is claimed is:

1. In combination, a tank having an inlet in an upper portion thereof to receive water from the surface of a swimming pool or the like; a partition extending across the tank and below said inlet and defining a chamber below the partition; said partition having an opening adapted to be supplied by water entering the tank through the inlet; means forming a seat about said opening; a float above the partition and engageable with the seat to close the opening; said float being engageable with said seat in response to a lowering of the level of water in the tank substantially below the normal operating level thereof; a cage adjacent to and above the seat confining the float to the area adjacent to the seat; means forming an outlet from the chamber adapted to be connected to the suction line of a pump; and by-pass means operative upon closure of said opening to supply the suction line, said by-pass means comprising a conduit leading from a source of water to said chamber.

2. The combination as set forth in claim 1 in which a removable strainer basket is supported in the tank above said partition, and said cage is formed at the bottom of said basket.

3. In combination: a manifold having an upper surface, and an opening adapted to be connected to a pump suction line; a hollow member having an upper open end and a lower open end provided with a continuous inwardly directed flange attached to the manifold at its said upper surface, the edge of the flange being exposed; a valve body resting upon said manifold surface and at

least partially fitting within said flange; said body defining with said manifold, a chamber about the opening of the manifold; said valve body having a central valve opening; an O-ring surrounding the valve body opening and defining a valve seat; a cage having a base ring attached to the valve body, an inverted dome portion, and a plurality of buttresses spaced angularly about the valve opening and supporting the dome in spaced juxtaposed relationship to said seat to allow access of water to the valve opening; a float confined by the cage for movement toward and away from the O-ring for sealing engagement therewith; a weight attached to the valve body for counteracting the buoyancy of said float; and by-pass means for supplying the suction line independently of presence of water at the float upon closure of said valve body opening, said by-pass means comprising a conduit leading from a source of water to said chamber.

4. In combination: a tank adapted to receive surface water from a swimming pool or the like, and having a bottom wall provided with an opening adapted to communicate with a pump suction line; a body freely removable from the tank and resting upon the bottom wall so that the body defines a chamber below the body; said body having an opening and means defining a seat about the body opening; a cage attached to the body above the opening and normally submerged entirely beneath the level of water in the tank, said cage permitting free flow of water to the seat; a float confined by the cage for limited movement toward and away from the seat to close the body opening; said float being engageable with said seat in response to a lowering of the level of water in the tank substantially below the normal operating level thereof; and by-pass means for supplying the suction line upon closure of said body opening, said by-pass means comprising a conduit leading from a source of water to said chamber.

5. The combination as set forth in claim 4 in which said cage is of unitary moldable form.

6. The combination as set forth in claim 4 together with a strainer basket supported by the tank above said cage.

7. The combination as set forth in claim 4 together with a valve flap pivotally mounted on said body beneath said seat for reducing to a selected degree the effective size of the body opening whereby flow relative to the by-pass may be controlled.

8. The combination as set forth in claim 4 together with a valve flap pivotally mounted on said bottom wall for reducing to a selected degree the effective size of said wall opening whereby the suction line is throttled at said tank.

9. In combination: a tank adapted to receive surface water from a swimming pool, or the like, and having a bottom wall provided with an opening adapted to connect with a pump suction line; a circular valve body having a rim sealingly fitting the bottom wall; said valve body having its central portion spaced from the bottom wall to define a chamber therewith; a broad diameter O-ring mounted on the body and forming a seat exposed in the tank above the body, and surrounding said opening; a unitary cage having a circular base ring attached to the body in spaced relationship about the seat, a plurality of angularly spaced radially arrayed narrow ribs extending upwardly from the base ring, and an inverted cup mounted on the ribs so that its edges are spaced above said base to form a flow path to said O-ring; a flat circular float having an undersurface engageable with said O-ring to seal said opening, and confined by the cage cup for limited movement toward and away from the O-ring; and by-pass means for supplying the suction line upon closure of said body opening, said by-pass means comprising a conduit leading from a source of water to said chamber.

10. The combination as set forth in claim 9 in which said base ring and said body define an annular space, and

9

in which a lead ring is supported in the space to counteract the buoyancy of said float.

11. The combination as set forth in claim 9 together with a strainer basket supported in the tank above the cage.

12. The combination as set forth in claim 1 in which the cage is so constructed and arranged as normally to shield the float against the drag of flowing water thereby to prevent closing of said opening except upon a lowering of the level of water in the tank.

13. A combination according to claim 1 in which a removable strainer basket is supported in the chamber below said partition and said by-pass means comprises an entrance through and into said basket within the chamber and said outlet from the chamber is outside said basket so that water entering the basket from the by-pass passes out through the basket, and into the chamber leaving the chamber through said outlet.

14. A combination according to claim 13 in which said by-pass means comprises a meter means for metering the water flow through said entrance into the basket.

15. A combination according to claim 13 in which a check valve is located at said by-pass means, said check valve opening to increase water flow through said entrance into the basket through the by-pass means when the float is seated.

10

16. A combination according to claim 13 in which a shut-off valve is located at the opening through the partition, said shut-off valve being adjustable to regulate the amount of water flow past the float into the basket.

17. A combination according to claim 13 in which the bottom of the basket contains an entrance conduit leading into the interior of the basket and the bottom of the chamber contains a passageway leading up from below the chamber into the interior of the chamber, for attachment of the bypass means from below the chamber, said entrance conduit of the basket being engageable with the passageway into the chamber so that water from the bypass is thereby brought into the interior of the basket.

References Cited by the Examiner

UNITED STATES PATENTS

2,914,180	11/1959	Konopka et al.	210—169 X
3,067,879	12/1962	Baker	210—169 X
3,080,060	3/1963	Blumenkranz et al. --	210—169
3,169,920	2/1965	Payne	210—169

REUBEN FRIEDMAN, *Primary Examiner.*

F. W. MEDLEY, *Assistant Examiner.*