June 24, 1941. L. J. DAY 2,247,116

INLET FITTING FOR SWIMMING POOLS

Original Filed March 13, 1937 3 Sheets-Sheet 1

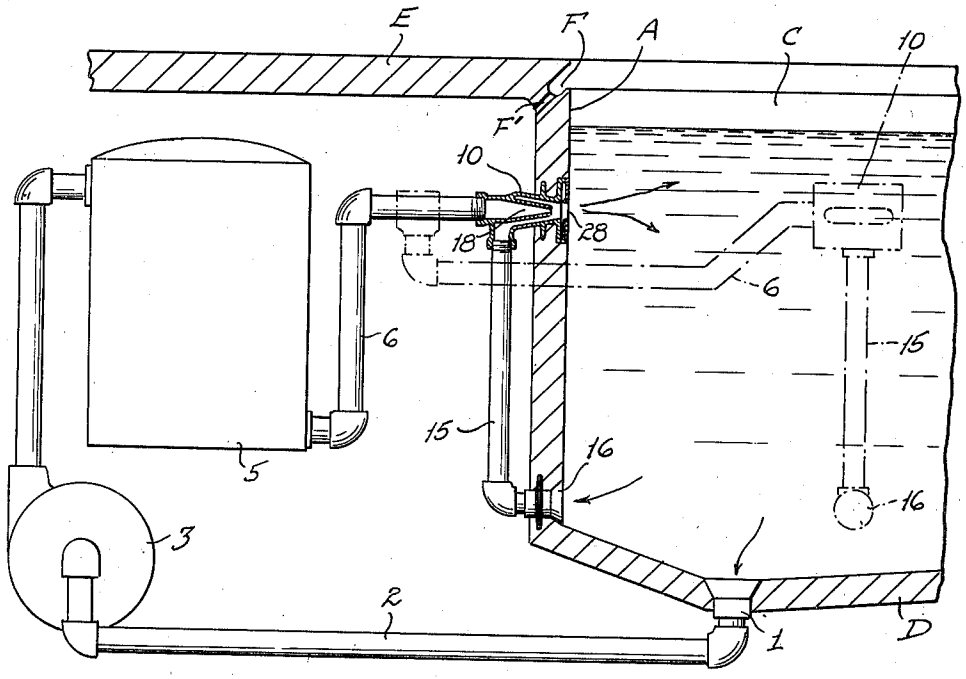

FIG. 1

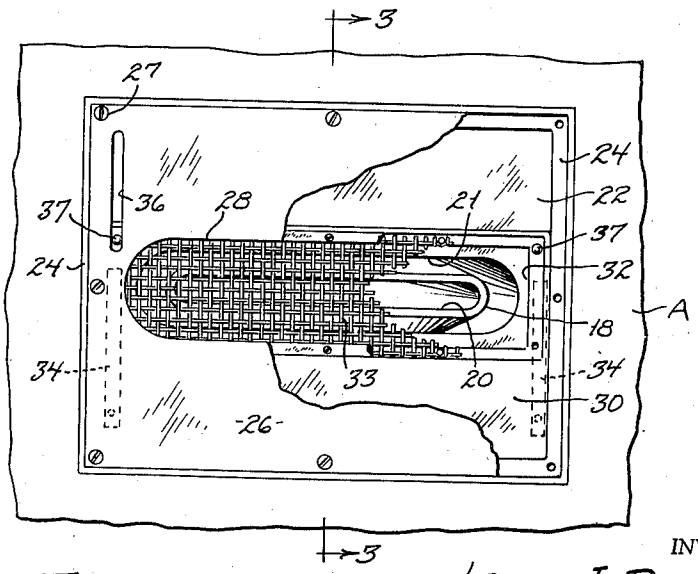

FIG. 2

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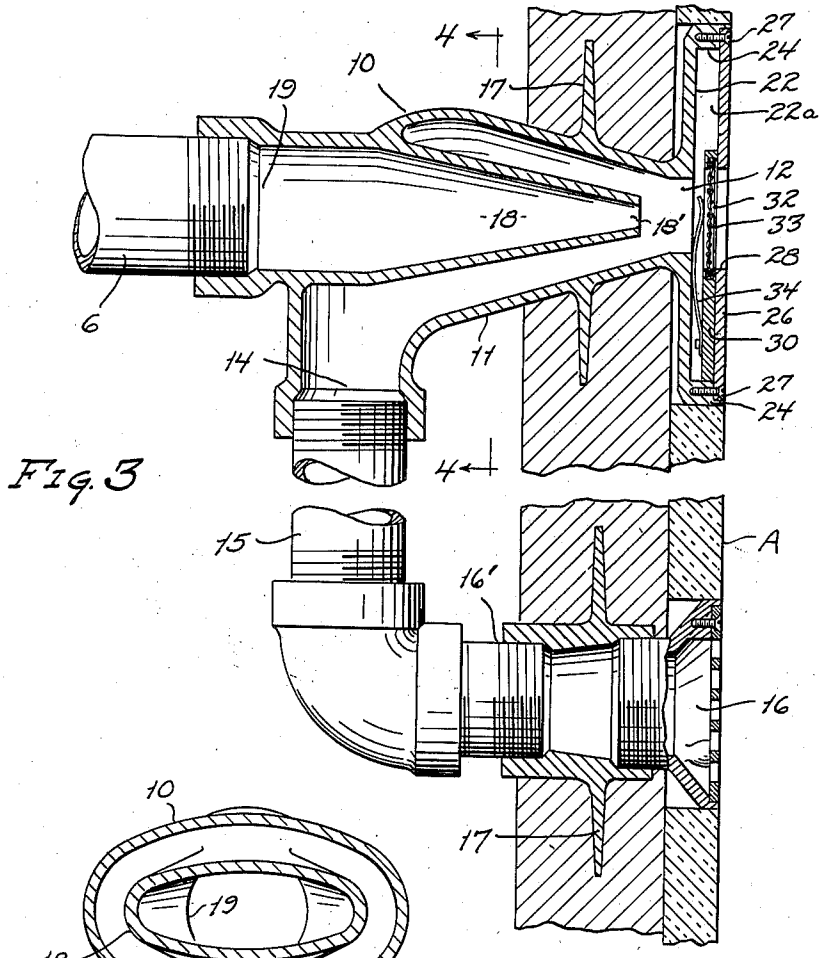

FIG. 3

FIG. 4

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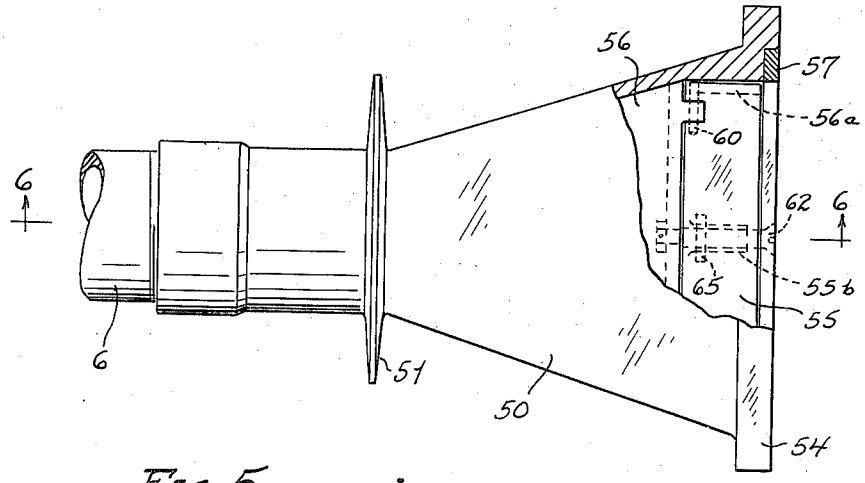

Fig. 5

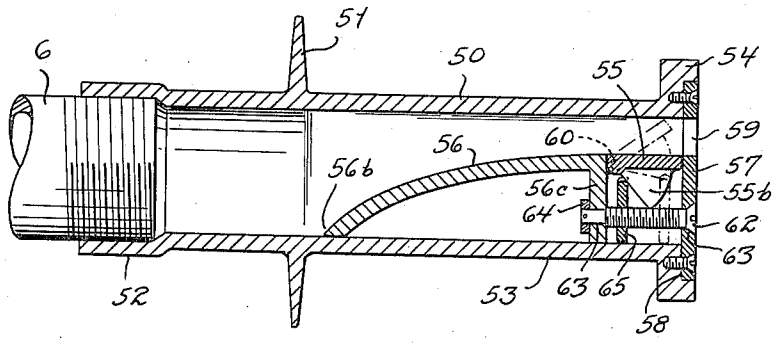

Fig. 6

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2,247,116

INLET FITTING FOR SWIMMING POOLS

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Original application March 13, 1937, Serial No. 130,781, now Patent No. 2,218,507, dated October 22, 1940. Divided and this application February 27, 1939, Serial No. 258,687

7 Claims. (Cl. 137—21)

This application is a division of my prior application Serial No. 130,781, filed March 13th, 1937, now Patent No. 2,218,507, granted Oct. 22, 1940.

The present invention relates to an apparatus for circulating water in swimming pools, and more specifically to an improved inlet fitting through which water is discharged into a swimming pool. These, therefore, are the general objects of the present invention.

Another object is to provide an apparatus for determining selectively the direction of water circulation in a swimming pool, which apparatus is simple in construction, efficient in operation, unlikely to get out of order, and which is settable for the selective controlling operation from a convenient point or from convenient points inside the pool.

Another object is to provide an adjustable device for admitting water into a swimming tank at different points depending upon its adjustment, which device tends to maintain a setting conducive to general circulation of water in the pool as against special circulation for localization of flow, as for cleanout purposes.

Other objects include the provision of an inlet fitting for a swimming pool which will enable an injector type flow of the water entering the swimming pool and which is adjustable to eliminate the ejector action and for diversion of water in at least two materially different directions, without having to make the adjustment apparatus unduly large or expensive.

Other objects and features of the invention will become apparent from the following description relating to the accompanying drawings which show the preferred form of fitting in connection with the water conditioning and forcing arrangement and distribution system of the parent application and patent above identified. The essential characteristics are summarized in the claims.

Referring to the drawings, Fig. 1 is a vertical section through a portion of a swimming tank or pool, showing my improved inlet fitting installed therein; Fig. 2 is a front elevation of the one form of inlet fitting, on an enlarged scale, certain parts being broken away to illustrate the internal construction thereof; Fig. 3 is a vertical section taken through the fitting, the plane of the section being indicated at 3—3 on Fig. 2; Fig. 4 is a transverse sectional detail, the plane of which is indicated by the line 4—4 in Fig. 3; Fig. 5 is a plan view of a modified form of inlet fitting, certain portions being broken away to more clearly illustrate the internal construction thereof; and Fig. 6 is a central longitudinal sectional view through the modified inlet fitting, as indicated by the line 6—6 on Fig. 5.

Referring to the general arrangement (Fig. 1 end or side walls of the tank are indicated at A and B (contiguous with opposite vertical walls, one of which is shown at C), and a bottom wall D which slopes downwardly from the vertical walls to a main outlet or drain 1 of any suitable form. A platform or floor adjacent the tank is indicated at E, and a gutter F is shown as formed in underhanging relation to the edge of the platform adjacent the vertical walls A, B, and C. Such gutter usually runs entirely around the pool.

Water circulation systems for which my improved inlet fitting is especially adapted for use are described and claimed in my prior patent and application heretofore mentioned. As illustrated in Fig. 1, such a system may include a main outlet or drain 1, connected as by one or more conduits 2, with a water forcing apparatus or pump 3. The pump discharges into a conduit 4 leading to a water treatment plant 5. Such plant may include the usual filtering medicating and heating means or any of such means as is desired. The conditioned water flows from the plant 5 through a conduit 6 to one or more inlet fittings, generally shown at 10 in Figs. 2 and 3, and thence into the swimming pool.

Swimming pools having water purification systems generally described above have been in extensive use. In such systems the efficiency of the pumps, filters and sterilizing equipment has been such that a complete turnover of a quantity of water equal to the pool capacity is made about every six or eight hours. However, it has been found that even with increased plant efficiency the water in the pool was far from being as pure as was desired; indeed, it was found that increasing the capacity of the plant merely caused a considerable amount of some of the water to pass through the filter during a turn-over period, due to circulation currents set up in the pool by the action of the water entering and leaving the pool. Thus, much of the water of the pool never passed through the treating plant. Now, as explained in my patent heretofore referred to, I have found that by returning the water to the pool at several points, and by returning with such treated water a quantity of untreated water, drawn from a different part of the pool than that from which the water is drawn for the treating unit, I obtain a circulation of water which, when properly applied, causes all of the water in the

pool to travel through the treating system, even though circulating currents are set up between the pool outlet and inlet leading to and from the treating system. In my improved systems, such currents necessarily include a considerable quantity of untreated water, thus insuring proper purification of the entire contents of the pool. Such a system is disclosed and claimed in my prior patent, heretofore mentioned.

In developing the system above described, it was found that if the water returning from the purification system to the pool created, by an ejector action, a flow of untreated water from the pool and returned such untreated water to the pool with the stream from the treating unit, an efficient and highly economical result was obtained and I have found that my improved inlet fitting increases the advantages and results accomplished by such system.

In circulating systems for swimming pools of the type above generally described, the purified water in the form of streams is generally fed into the pool at a point or points adjacent the water level in the pool. However, under certain conditions it is desirable to feed the treated stream into the pool adjacent the floor thereof. As, for instance, when the pool is being filled with heated water, or the temperature of the water in the pool is being raised, it becomes desirable to feed the purified and heated water into the pool adjacent the bottom thereof to prevent stratification of the tempered water in the pool, due in part to the cooling of the water by the walls and floor of the pool. The apparatus with which this invention is concerned is arranged to permit an ejector feed into the pool adjacent the water level or to stop the ejector action and divert the water into the pool adjacent the bottom thereof by a simple manipulation of my improved fitting from within the pool. This diversion of flow is sometimes desirable to flush the floor or bottom of the pool without disturbing the upper area of the pool by causing the pump fed stream to enter the pool adjacent the bottom thereof and cause the water to flow along the floor of the pool to the main outlet which is located in the floor of the pool. These are further advantages of my improved fitting.

As illustrated in Figs. 1 to 4, inclusive, my improved inlet fitting 10 comprises a shell 11 having an outlet opening 12. The shell is L-shaped, as shown in Fig. 3, and the outlet opening is at the end of the horizontal leg thereof. The vertical leg of the shell 11 is provided with an opening 14, which, when the fitting is set for an ejector action, as will hereinafter be described, acts as an inlet opening and at other times as an outlet opening. The opening 14 is in communication with a conduit 15, which extends downwardly and is connected as at 16' with a grilled fitting 16, which communicates with the swimming pool. The arrangement is such that the shell 11 is positioned in one side wall of the pool adjacent the water level thereof, and the fitting 16 in such side wall of the pool adjacent the bottom of the pool. Both fittings 10 and 16 are provided with integral outwardly extending flanges 17 which, as shown, are embedded in the concrete wall of the swimming pool to retain the fittings in position therein.

The pump forced stream of treated and/or heated water is forced from the treating plant 5 through the conduit 6 into an ejector nozzle 18 positioned within and forming an integral part of the shell 11. As shown, the upper and lower walls of the horizontal leg of the fitting 11 converge as they approach the outlet opening 12, while the side walls diverge as they approach such opening. The shell 11 has a third or inlet opening 19 substantially opposite and parallel with the outlet opening 12. This opening communicates with the nozzle 18, which extends from the wall of the shell adjacent such opening horizontally toward the outlet opening 12 of the shell. The walls of the nozzle 18 are, as shown, substantially parallel with but spaced inwardly from the walls of the horizontal leg of the shell, forming a passageway therebetween, which passageway is in communication with the shell openings 12 and 14, heretofore described. The outer end of the nozzle is spaced inwardly from the shell outlet opening 12 and is provided with the usual nozzle opening 18'.

Referring further to the fitting 10, both the nozzle 18 and shell 11 of the casting are horizontally elongated, as shown in Fig. 4, the inner termini of both being nearly rectangular as shown in Fig. 2, wherein the ultimate discharge opening of the nozzle is indicated at 20, and the discharge opening of the outer portion at 21. An enlargement 22 is formed on the outlet end of the shell of the fitting, this being rectangular in form, as shown in Fig. 2 and having peripheral flanges 24 which, as shown in Fig. 3, are set flush with the inner wall of the pool and is provided with a face plate 26 supporting a protective grill, as will be hereinafter described.

An important feature of the present invention is the arrangement for controlling, selectively, the submerged flow of water in the pool in connection with a circulating system which includes means for recirculating water in the pool without having to pass such water through the entire water treatment plant or circulating system. This has many advantages, including the provision of greater water turn-over and effecting practical elimination of stagnant zones, without having to increase, or materially increase, the capacity of the treatment plant or pumping means.

As claimed in my patent heretofore mentioned, localized submerged flow occurs in directions towards the outlets 16 whenever the injectors are operated by water forced from the pumping means. This occasions no special load on the pumping means, and, by judicious placement of a sufficient number of induced flow outlets, all dead-spots may be eliminated from the pool. However, the induced flow is normally in constant directions because the positions of the outlets must necessarily be fixed as a practical matter. The present arrangement allows the same apparatus to be used to create flow in other directions, and includes provision of a very simple means to adjust and/or block the normal outlet of the injector devices, as will now be described.

Referring further to the enlargement 22 of the injector fitting 10, it will be noted that the space 22a afforded by the enlargement 22 and its flanges 24, is partially covered by a plate 26 secured as by screws 27 to the flanges. This plate has a generally rectangular opening 28 aligned with the discharge orifice of the injector,—somewhat larger, but of similar shape, as shown. The space 22a forms a vertical guideway for a rectangular frame 30. The frame 30 rests on the bottom of said space, i. e. against the lower flange 24 as a stop, and in this position of the frame water passes through an opening 32 in such frame, which may be suitably protected by a grill

work formed in the frame, or wire screen 33, such as shown. Leaf springs 34 secured to the back of the frame and reacting on the adjacent surface of the enlargement 22 of the fitting 10 press the frame forwardly against the plate 26 and form a retaining means for the frame, particularly when the same is elevated to position the frame so that its lower imperforate portion blocks (wholly or partially, as desired) the passage of water through the opening 28 in the plate 26. To facilitate the positioning of the frame, guide slots 36 are provided in the outer plate 26 into which pins 37 (fixed to the frame) extend a sufficient distance to permit the frame to be raised manually from inside the pool. The strength of the spring 34 is such as to maintain the frame in any desired position indefinitely.

If one or more of the normal inlet openings 28 associated with the injectors is, or are, closed as by the means just described, then the injector or injectors so affected function to pass water in a direction reverse of normal,—i. e. downwardly through the conduit or conduits 15 and into the pool through the outlet fitting 16. This in the particular arrangement of tank outlets 16 shown, may be used principally when changing the temperature of the contents of the pool or when it is desired to flush the tank as by overflowing it, because such reversal of direction would tend to lift water from the bottom of the tank toward the top where it overflows into the gutter F and is drained out as at F'. However, the system can also be used by effectively blocking some of the injectors from their normal action, causing reversal of flow on one or more of the conduits 15, while one or more other injectors functions or function in the normal manner above described to create induced streams outwardly toward the fittings 16.

It will be noted that while positive locking means may be provided to hold the frames 30 in lifted position, this is unnecessary, because the springs 34 are sufficient to insure maintenance in such position during short periods. Gravity tends to lower the frames, which is a desirable feature, because in general, maintenance of induced flow through the conduits 15 has been found most effective in overcoming dead-spot conditions in the pool or tank.

Referring to Figs. 5 and 6, the construction there shown may be used for the outer end of the fitting 10 (or independently of any injectors for that matter), as, for instance, an alternative means for controlling feeding of water into the pool. In other words, the fitting 50 may be formed to include an injector as part of its construction or it may be used as illustrated at the discharge end of a conduit such as 6, to merely control the passage of water to and from the swimming pool.

The fitting 50 has an anchor flange 51 intermediately of its ends, an internally threaded inlet at 52 and a latterally widened discharge and adjustment containing portion 53 flanged at its outer end as at 54. The outer face of the flanged end may be set flush with the inside wall surface of the tank.

Discharge through the fitting can be controlled or blocked by the gravity opened control device shown inside the widened end of the fitting 50, of which device 55 is a valve plate and 56 a supporting body for the plate. The body 56 has a flanged outer end portion 57, open at 59; the portion 57 being set into a recess 58 in the flanged part of the fitting, and adapted to be secured as by screws. The body 56 is extended around the valve plate at both side edges of the latter, see 56*a* Fig. 5, and thence inwardly and downwardly substantially into contact with the floor portion of the fitting as at 56*b*. The valve plate is pivoted at 60 to the support 56 in such position that it may be swung upwardly into the broken line position to close the outlet.

Water in order to pass out of the opening 59 has to rise over the body 56, and, in the position of the valve plate shown in full lines, such water merely flows over the top face of the valve plate.

To adjust the plate 55 there is provided an adjusting screw 62 (more than one may be provided) supported to turn in aligned openings 63 in spaced depending portions of the body 56, including a depending portion 56*c*, and held against endwise movement as by the head of the screw and a collar 64 opposite the head. The screw is accessible for adjustment from inside the pool, as by means of a screw driver. The threaded shank of the screw threadingly engages a pusher plate 65, the upper end of which travels back and forth against the under side of a cam 55*b* on the under side of the valve plate to open and close the valve when the screw is turned in opposite directions.

It is to be understood that while I have illustrated in the drawings fitting structures which are adapted to be used with swimming pool constructions wherein the walls are formed of concrete, nevertheless the fittings can be readily adapted to tank or pool structures which are constructed of materials other than concrete, as, for example, swimming pools wherein the tank structure has the side walls and bottom thereof formed of iron or sheet-metal plate.

I claim:

1. An injector fitting for swimming tanks, comprising a hollow body having a supply inlet and nozzle, a wall surrounding the nozzle and spaced therefrom to provide a suction space, said wall being continued beyond the nozzle to form a discharge port, said wall and nozzle having similarly flattened portions, and means movably mounted in the fitting for travel across the major axes of said flattened portions to open and at least partially close the discharge port.

2. A supply fitting for swimming tanks, comprising a body adapted to be embedded in a masonry wall and being open at opposite ends, one end being enlarged and having a transverse guideway formed therein, a frame slidable in the guideway and arranged to close one of the effective openings in the body in one position of the frame and to restrict or close said opening in another position, said frame having a grilled opening disposable in alignment with the effective discharge passage of the valve, a plate overlying the frame as part of its guideway, and adjusting means for the frame accessible from the exposed side of the plate.

3. A fitting for supplying water to swimming tanks, comprising a hollow body having an opening at one end, a frame member adapted to be secured to the body in a manner partially to close it, a partition member carried by the frame and extending into the body in a manner to direct water toward the non-closed portion of the opening, a plate pivoted to one of said members and swingable with relation to said non-closed portion of the opening to restrict it, and means accessible for adjustment from outside the body, reacting on one of said members and operatively

connected to the plate in a manner to adjust the plate.

4. The ararngement according to claim 3, wherein the said members are virtually integral so that the valve plate, frame partition member and adjustment device form a self-contained unit which is installed in operating position when the frame is attached to the body.

5. An inlet fitting for swimming tanks, comprising a hollow body open at one end and having a frame disposed across said end in partially closing relation to the opening, a partition member rigid with the frame extending across the interior of the body and dividing the body for diverting flow of water at one side of the partition member, a valve pivotally carried by the partition member and swingable outwardly from it to restrict such flow of water, a movable device engaging the valve in a manner to adjust it, and a screw carried in part by the frame and in part by the partition and operatively engaging said device.

6. An inlet fitting for a swimming tank comprising a hollow body having an inlet at one end and an outlet at the other, adapted to operatively face the interior of the tank, means for restricting or closing the outlet, arranged normally to occupy a non-closing position relative to the outlet, and means disposed within the outlet and accessible from inside the tank to adjust the first-named means in a manner to restrict or close said outlet.

7. The arrangement according to claim 6, wherein the first-named means is maintained by gravity in the non-closing position mentioned.

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