Dec. 1, 1925.

1,563,851

F. E. HARTMAN

SWIMMING POOL

Filed April 22, 1922

2 Sheets-Sheet 1

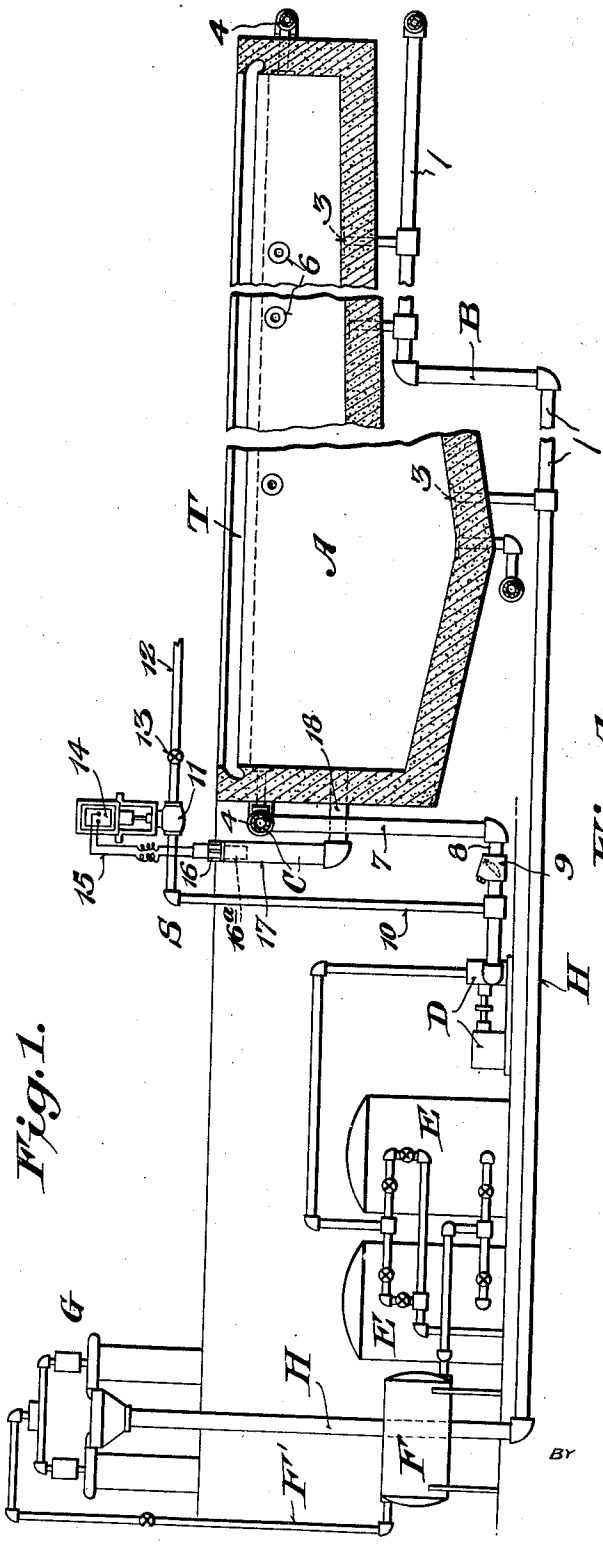


Fig. 1.

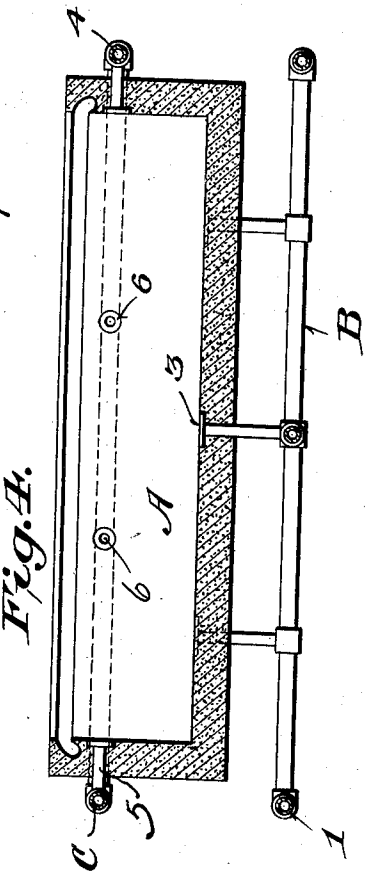


Fig. 4.

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2 Sheets-Sheet 2

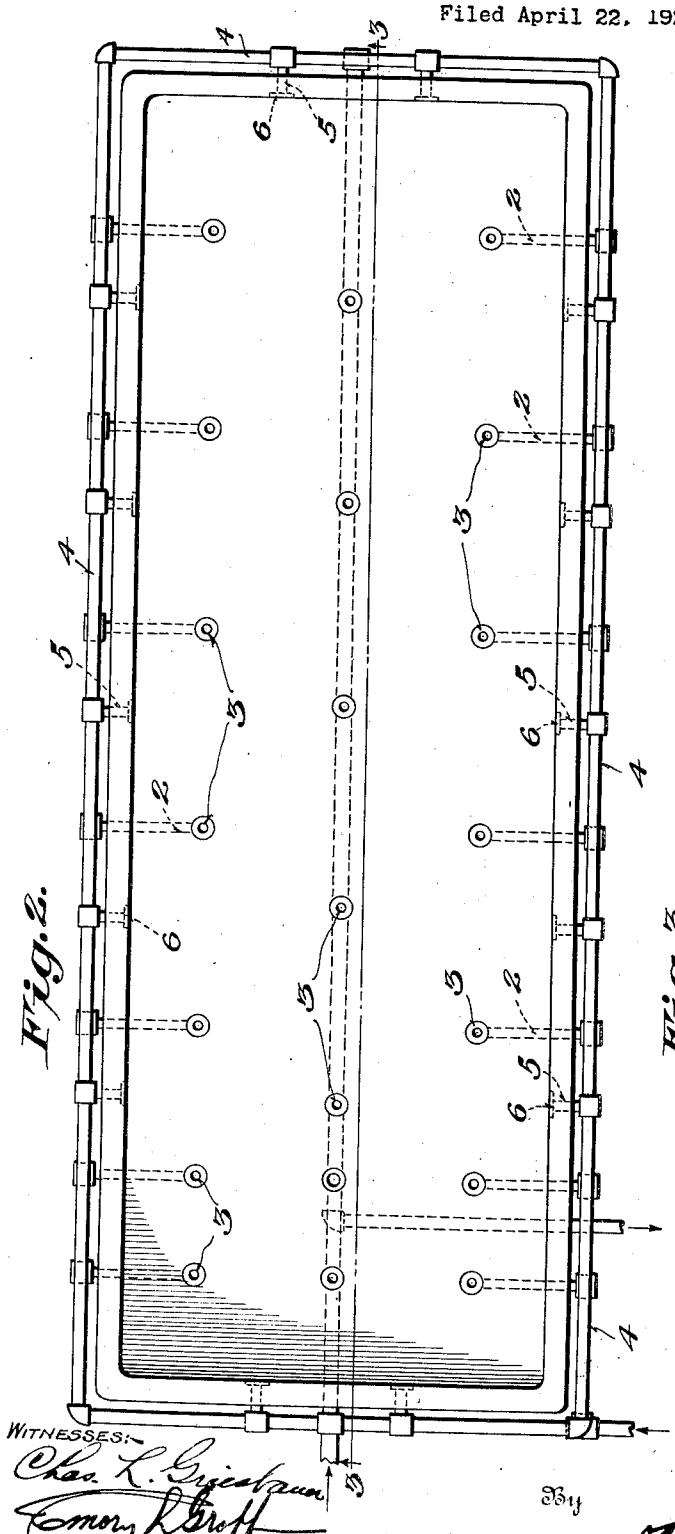


Fig. 2.

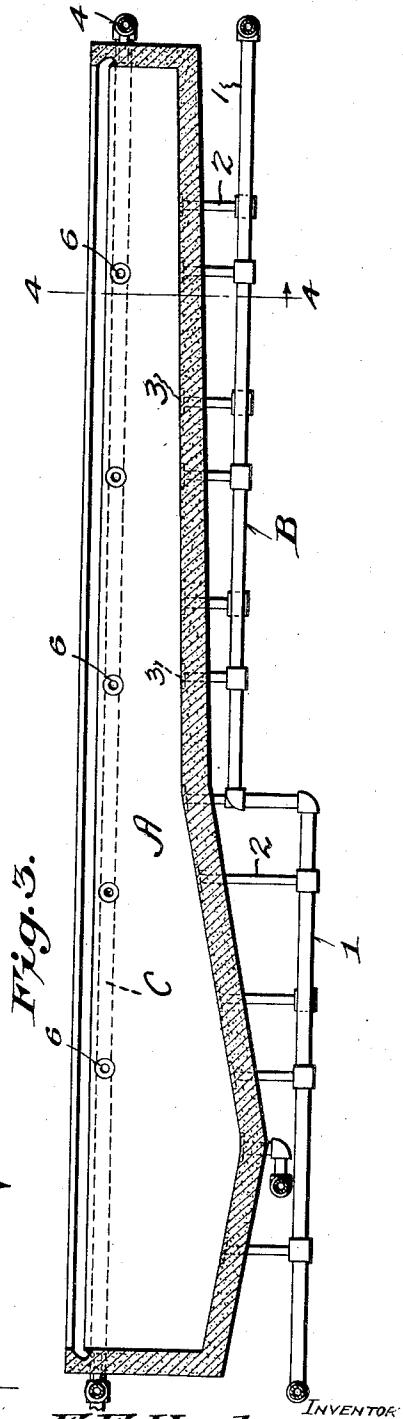


Fig. 3.

WITNESSES:-

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INVENTOR

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Patented Dec. 1, 1925. 1,563,851

UNITED STATES PATENT OFFICE.

FRANK E. HARTMAN, OF SCOTTDALE, PENNSYLVANIA, ASSIGNOR TO ELECTRIC WATER STERILIZER AND OZONE COMPANY, OF SCOTTDALE, PENNSYLVANIA, A CORPORATION OF PENSYLVANIA.

SWIMMING POOL.

Application filed April 22, 1922. Serial No. 556,051.

To all whom it may concern:

Be it known that I, FRANK E. HARTMAN, citizen of the United States, residing at Scottdale, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Swimming Pools, of which the following is a specification.

This invention relates to an improvement in swimming pools and more particularly to a novel circulating system for maintaining the water in the pool at a maximum degree of purity and also of even temperature throughout.

In swimming pools used by a large number of bathers, it is necessary to provide means for maintaining the water at a high standard of purity, and in pools of large capacity it is desirable to reuse the water to obviate a large economic waste. As the impurities in the pool of water float or rise near the surface and the bathers are in contact with the surface water more frequently than at lower levels, it becomes necessary to insure that the surface water is constantly removed and replaced by purified water which is distributed in the pool in such a manner that all of the water in the pool is kept in circulation, thereby not only insuring the desired standard of purity but also maintaining safe temperature conditions.

The present invention aims to provide a novel apparatus for circulating and purifying the water of the pool in the manner set forth in my copending application Serial No. 556,049, filed April 22, 1922, wherein it is proposed to supply the fresh water at the bottom of the pool so that the circulation of all the water in the pool is upwardly from the bottom and outwardly toward the edges. In that connection the present improvement contemplates an apparatus for positively including all of the water of the pool in a closed circuit without depending on the water being returned through the overflow rail as distinguished from my copending application Serial No. 556,050, filed April 22, 1922, thereby adapting the present apparatus to installations where the sump device of my said application Serial No. 556,050 cannot be conveniently used.

A further object of the invention is to provide simple and practical means for maintaining the water in the pool at maximum capacity at all times to insure the free circulation of the water from the pool to and through the filtering, heating and purifying instrumentalities prior to its passage into the pool.

With the above and other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts, hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 is a more or less diagrammatic view, partly in section, illustrating the improved system.

Fig. 2 is a top plan view of the pool showing the piping arrangement.

Fig. 3 is a longitudinal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 3.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

In carrying the present invention into effect, it is proposed to equip the pool A with the influent piping system B and the effluent piping system C, the latter leading to a suitable pumping device D for positively maintaining the circulation of water from the pool to the filter units E, which in turn communicate with a heater F connected by suitable piping F′ with an ozonizer unit G. From the ozonizing unit, the purified water is conveyed through the pipe H to the influent system B.

As will be observed from the drawings, the influent piping B is arranged at the bottom of the pool, while the effluent piping is arranged adjacent the upper edge thereof and communicates with the interior of the pool at a point adjacent to and below the overflow trough T, as will presently appear. The path of the water in its passage through the pool is therefore from the bottom upward toward the outer edges of the pool,

thereby insuring the constant removal of surface water and obtaining the full benefit of the heat carried by the warm fresh water supplied at the bottom of the pool.

By providing the influent piping B and effluent piping C, it will be understood that a closed circuit for the water is maintained without utilizing the overflow trough T. In this type of installation the overflow trough simply serves to carry to waste the water which is displaced by bathers entering the pool.

Another novel and distinctive feature of the present improvement is the novel supply unit S which provides for maintaining the water of the pool at the predetermined capacity to maintain the effectiveness of the circulating system. When the bathers enter the pool, the water displaced by their presence becomes lost through the overflow trough and also considerable water is carried away by the bathers and a certain proportion evaporates. To make up for this loss the supply unit S automatically operates when the level of the pool falls below a certain point to supply the system with additional fresh water at a point in the circuit anterior to the pumping, filtering, heating and purifying instrumentalities.

Referring now more particularly to the details of construction for carrying the invention into effect, it will be observed that the influent piping system B preferably includes a supply pipe 1 surrounding the bottom of the tank and having a plurality of offset supply pipes 2 having discharge ports 3 suitably distributed and located throughout the bottom of the tank. The pipe 1 connects with the piping H from the ozonizer and distributes the heated and purified water to the bottom of the pool.

The effluent piping C at the top of the pool preferably consists of a common receiving pipe 4 having a plurality of laterally extending receiving pipes 5 which project horizontally through the side walls of the pool to communicate as at 6 with the interior of the pool around the upper side edges thereof and below the mean water level. By distributing the outlets of the effluent piping and the inlets of the influent piping, as shown in the drawings, the pressures are equalled so that more water will not enter at one point than at another.

As will be observed from Figure 1, the common discharge pipe 4 of the effluent piping C communicates with a pipe 7 which in turn is connected with a pipe section 8 having therein a check valve 9 and a fresh water supply connection 10 leading from the supply unit S. The said fresh water supply pipe 10 communicates with an automatic valve 11 located in the main supply line 12 which may have therein a suitable manually operated cut-off valve 13 if desired.

In connection with the supply unit S which includes the pipe 10 communicating with the source of water supply 12, it will be observed that the valve 11 is of any suitable electro-magnetic type which is normally closed, but operates at the occurrence of a predetermined condition to open the supply line to the pipe 10. As shown in the drawing, the said valve 11 preferably includes a suitable electro-magnet housing 14 having the wiring connections 15 leading to a terminal element 16 arranged within a stand pipe 17 which communicates through the connection 18 directly with the pool A. Within the pipe 17 a suitable float 16^a is provided so that when the water in the pool A drops below the predetermined level established by the inlet orifices of the influent piping C, the said float will close the circuit to the terminals 16 and operate the electro-magnetic valve to permit water from the supply line 12 to flow into the pipe connection 10.

To prevent the pressure of the water in the line 10 from backing up into the pool without going through the pump device D and the filtering, heating and purifying instrumentalities, the check valve 9, previously referred to, is provided. Obviously, the operation of the pump will draw water through the effluent system C and through the pipes 7 and 8 as long as the water in the pool A is above the level of the inlets 6 of the effluent system but when the water falls below the inlets the float 16 will operate the valve 11 to permit fresh water to flow into the pipe 8. As the water supplied through the pipe 12 is usually from city mains under high pressure, it might make its way in the pool through the effluent piping if it were not for the check valve 9. However, this valve effectually guards against such occurrence and the device is thus insured of positive operation at all times without attention.

From the foregoing it is thought that it will be apparent that the present invention provides novel means for causing the positive circulation of water in the pool and effectually provides for replenishing the supply when the same falls below a predetermined level.

While it will of course be understood that various changes may be resorted to in carrying the invention into effect, it will of course be understood that the primary and underlying features of the invention, heretofore pointed out, are adhered to.

I claim:—

1. A circulating system for swimming pools including in combination, an overflow trough surrounding the pool, an influent piping system arranged at the bottom of the pool and communicating therewith, an effluent piping system arranged near the top of

the pool and communicating therewith below the trough, and piping connections including a pump establishing communication between said systems.

2. A circulating system for swimming pools including in combination, an overflow trough surrounding the pool, an influent piping system arranged beneath the pool, an effluent piping system communicating with the pool below the trough, connections between said influent and effluent piping systems, said connections including filtering, heating and purifying instrumentalities, a circulating pump and an automatic float controlled valve for maintaining the level of water in the pool above the inlets for the effluent system.

3. A circulating system for swimming pools including in combination, an overflow trough surrounding the pool, an influent piping system arranged beneath the pool, an effluent piping system communicating with the pool below the trough, piping connections between said influent and effluent piping systems, said connections including filtering, heating and purifying instrumentalities, a circulating pump, a valved fresh water supply pipe joining said connections between the pump and the effluent piping system.

4. A circulating system for swimming pools including an influent piping system arranged beneath the pool, an effluent piping system communicating with the pool below the mean water level, connections between said influent and effluent piping systems, said connections including filtering, heating and purifying instrumentalities, a circulating pump, a fresh water supply pipe joining said connections between the pump and the effluent piping system, and a valve in said fresh water supply pipe line adapted to be automatically controlled by the level of water in the pool to open and close the said supply line, and a one-way check valve arranged in said piping connections between the point where the fresh water supply joins therewith and the influent piping system.

5. A circulating system for swimming pools including an influent piping system arranged at the bottom of the pool and having a plurality of discharge outlets distributed in the floor of the pool to effect uniform distribution of the water supply to the pool, an effluent piping system consisting of a common discharge pipe having a plurality of inlet connections communicating with the pool below the mean water level, piping connections for joining said influent and effluent systems, a circulating pump arranged in said piping connections, means for supplying fresh water to said piping connections, and means operated by the level of water in the pool for controlling said last mentioned means.

6. A circulating system for swimming pools including in combination, an overflow trough surrounding the pool, an influent piping system arranged at the bottom of the pool and communicating therewith, an effluent piping system arranged at the top of the pool and communicating therewith below the trough, piping connections establishing communication between said systems, a circulating pump included in said connections and an automatic fresh water supplying unit for introducing water into said piping connections anterior to the pump, said unit including a valved supply line leading into said connection anterior to the pump, a float for controlling said valved supply line and being responsive to the water level within the pool between the overflow trough and the outlets of the effluent system.

In testimony whereof I hereunto affix my signature.

FRANK E. HARTMAN.