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AQUARIUM EQUIPMENT

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2 Sheets-Sheet 1

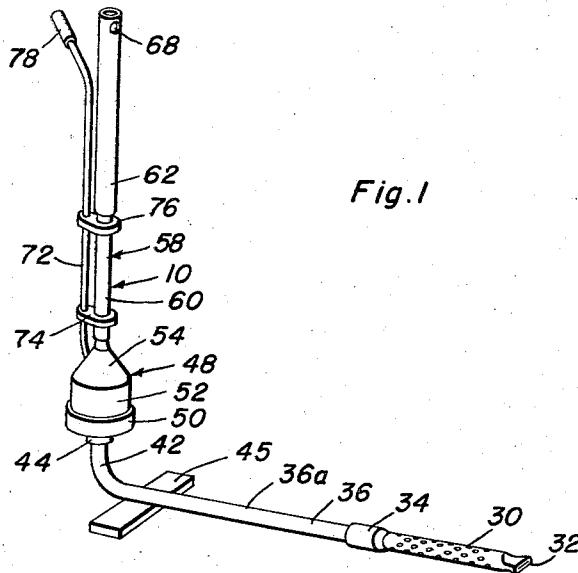


Fig. 1

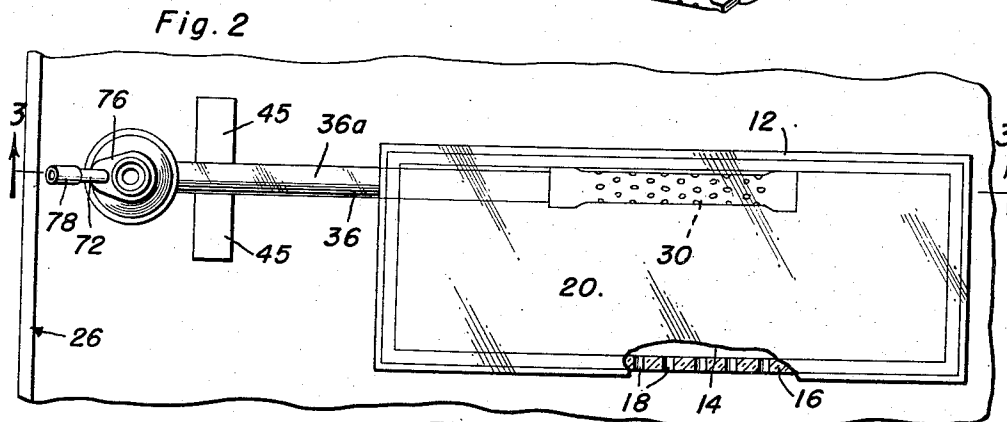


Fig. 2

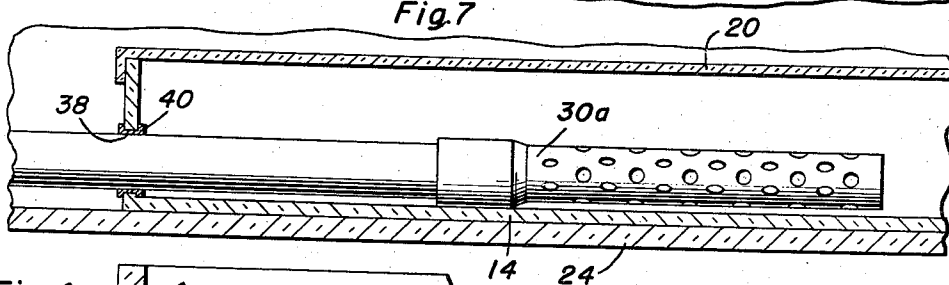
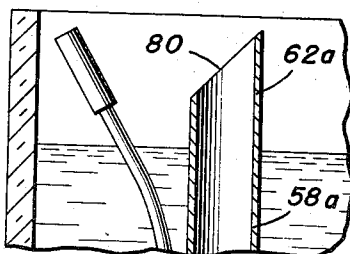


Fig. 3

Fig. 4



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Fig. 3

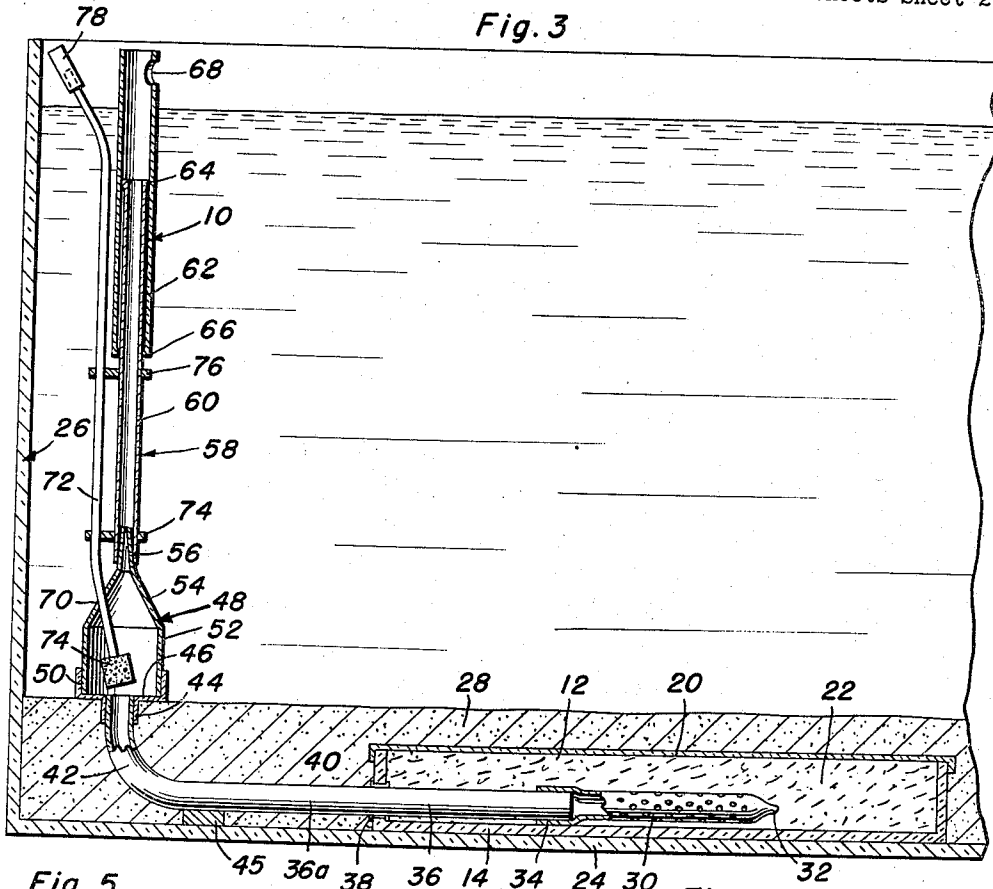
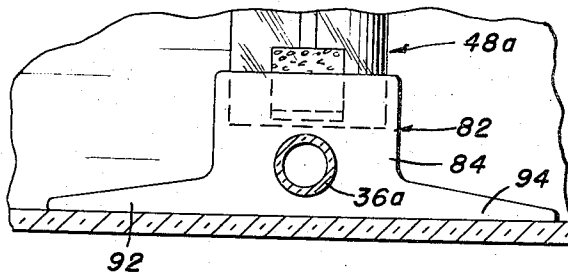
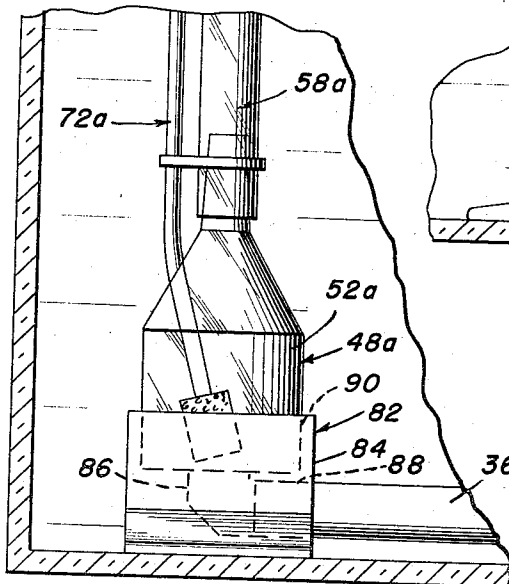


Fig. 5

Fig. 6



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AQUARIUM EQUIPMENT

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2 Claims. (Cl. 210—169)

This invention generally relates to improvements in aquarium equipment and particularly relates to an improved and novel device for filtering, aerating and conditioning the water in an aquarium.

A primary object of the present invention is to provide a simple and compact device for aerating, filtering, circulating, conditioning and clearing the water in an aquarium.

Prior devices were provided to aerate, filter and circulate the water by using compressed air forced through a porous stone in a vertical tube in the aquarium so that the water was drawn through the sand in the bottom of the tank and forced up the tube by the air to flow over the top of the tube. Such prior devices had no effect on the water coloration after sand filtration and had no effect on the condition of the water, i. e., whether hard or soft, acid or alkaline and are largely ineffective as far as the overall problem of water treatment and maintenance is concerned.

With the present invention, not only is the water aerated, filtered and circulated in the tank, in a manner far more effective and simpler than with known devices, but in addition, the water is conditioned and cleared. Thus, the water is cleared of coloration after sand filtration and the condition of the water is changed to overcome deleterious water conditions, i. e., too hard or soft, etc.

Another important object of this invention is to provide a new water circulation means which will prevent splashing of the water, as it is filtered and recirculated, on lights or other fixtures that may be in use at the top of the tank.

Another important object of the present invention is to provide an adjustable water exhaust tube that can be vertically adjusted to vary the height thereof and can be rotatably adjusted to vary the direction of flow of the exhaust water at the top of the tank.

A further important object of this invention is to provide a divided air release chamber in which an air release is located so that the passage of air bubbles up to the exhaust tube is facilitated before the small bubbles have an opportunity to combine into larger bubbles with the consequent operational advantage that more air surface is exposed to the water.

A still further object of the present invention is to provide an anti-coloration and conditioning means through which the water passes as it is drawn into the air release chamber and passes up therefrom through the exhaust tube, such means serving to condition and clear the water.

A still further object of this invention is to provide a device of the above type, which device is formed to be positionable at any desired place in a tank and which is simple, compact and easily operated and controlled in an efficient and inexpensive manner.

The foregoing and ancillary objects are attained by this invention, the preferred embodiments of which are

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set forth in the following description and illustrated in the accompanying drawings, wherein:

Fig. 1 is a view in perspective of the device of this invention;

Fig. 2 is a top plan view thereof, partly in section, and showing the same positioned in an aquarium tank;

Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a detailed vertical sectional view of a modified form of outlet for the water exhaust tube;

Fig. 5 is a detailed side elevational view of a modified form of connection and mounting for the air release chamber;

Fig. 6 is a front elevational view of the form of Fig. 5, and

Fig. 7 is a detailed side elevational view of a modified form of water inlet in the filter container.

Referring now more particularly to the attached drawings, the water handling and treating device 10 is particularly designed and constructed for use in aquariums for fish and the like and it is so designed and constructed as to perform the combined functions of aerating, filtering, circulating, conditioning and clearing the water. Thus, the device 10 performs all necessary functions to maintain the water in proper and perfect condition.

The device 10, as shown in Figs. 1-3, comprises a container 12, which is illustrated as rectangular, but may be of any other shape. The container 12 has a flat bottom wall 14 and upstanding end and side walls. One side wall 16, as shown in Fig. 2, is provided with perforations 18 for the flow of water into the container. A flanged lid 20 fits over the upper edges of the side and end walls and encloses the container. Except for the side wall 16, the container is imperforate. The container houses a quantity of water conditioning and coloration material 22. Such material may be carbon, zeolite, peat or a similar material, which is active to clear the water of coloration after sand filtration and to condition the water. Such material may be a mixture of known materials suitable for such purpose. The bottom wall 14 of the container is adapted to seat on the bottom wall 24 of a tank 26 with the sand 28 overlying and hiding the container.

Positioned within the container is a perforated suction pipe 30 which is disposed longitudinally within the container on the bottom wall so as to be under the material 22 and is disposed adjacent the side wall opposed to the perforated side wall 16. In this regard, the perforations 18 in the side wall 16 are formed adjacent the upper end thereof so that the water entering the container, through the perforation 18, is forced to travel, in an effective and thorough manner, through the material 22 to reach the pipe 30. The perforations in the pipe are of a small diameter so as to exclude any of the filter material. The pipe 30 has a pinched closed inner end 32 and a coaxially enlarged outer end 34 within which a tube 36 is press-fitted or otherwise secured. The tube 36 slidably extends through an opening 38 in the front wall of the container, such opening being provided with any suitable gasket means 40.

The tube 36, which is rigid, has an upstanding outer end portion 42 and, adjacent the point of curvature, the tube 36 is provided at its underside, with a lateral stabilizing foot 44, which is adapted to seat on the bottom wall 24 of the tank.

It is to be noted that the tube includes a horizontal section 36a and a vertical section 42. The horizontal section 36a enters the container 12 in such a manner as to be in telescopic relation with the container. By virtue of such structural relationship of the tube 36 with the container, the material container can be placed in any

desirable subterranean location in the tank. The container can, therefore, be moved relative to the horizontal section 36a into any desired position on the bottom wall of the tank.

The vertical section 42, as shown in Fig. 3, is fitted within a collar 44 that depends from the underside of the base 46 of an air release chamber 48. The base 46 provided with an aperture aligned with the section 42 of the tube and has an upstanding peripheral flange 50. The chamber 48 is composed of the base and a circular body member 52 which fits within the flange 50. The body member has a conical upper end portion 54 which terminates at its apex in an integral frusto-conical fitting 56. The air release chamber is, thus, circular or round at its lower portion and tapers in a cone shape to the apex where it again tapers in a conical outlet. This construction is provided in order to facilitate the passage of air bubbles up the exhaust tube 58 before small bubbles have an opportunity to combine into larger bubbles.

The exhaust tube 58 is composed of two telescopic tubular sections 60 and 62. The lower section 60 has the fitting 56 frictionally fitted in its lower end, as shown in Fig. 1, and has an outwardly beaded upper end 64. The end 64 is outwardly flared in a rounded manner to provide a frictional stop, as will be described. The section 60 telescopically fits within the upper section 62 which has an inturned lower end 66 that cooperates with the end 62 in frictionally retaining the sections in the desired telescopic relation. The upper section is rotatable on the lower section and is slidable thereon to position it at the desired height and at the desired point. In the latter respect, the upper section is formed adjacent to and slightly below its upper end with an exhaust opening 68 which constitutes the outlet for the water. Such opening 68 is formed in the side wall of the upper section and is situated between the water level and the top of the tube. Downward pressure exerted by the head of water formed above the exhaust opening 68 causes the admixture of air and water, which is lighter, to be expelled with considerable force from the side exhaust opening 68 which causes circulation of the water above the sand bed and prevents splashing on the lights and other fixtures which may be in use at the top of the tank. Due to the rotation of the upper section, the side exhaust opening can be directed toward any part of the tank. The telescopic arrangement of the sections of the exhaust tube permit an adjustment as to height so that the most efficient flow may be realized from the exhaust tube.

The upper end portion 54 of the air release chamber is formed with an oblique opening 70 in its side wall to slidably receive an air tubing 72 which preferably extends within the air release chamber to the lowest point to contact the incoming water and has a porous stone 74 fitted on its inner open end. The tubing 72 is attached to and supported by the air exhaust tube 58. In this respect, a holder 74 is fixedly circumposed on the lower section 60 and has a vertical opening through which the tubing 72 is fitted while a similar holder 76 is adjustably circumposed on the section 60 and has a similar opening to receive the tubing. The holder 76 is adjustable vertically on the section 60 and is held in place by a frictional fit. The tubing 72 terminates, at its upper end, in a suitable fitting 78 for attachment to the air supply hose (not shown) from a source of compressed air.

In Fig. 7, the pipe 30a is provided with a closed inner end which is not pinched shut, as in the case of the pipe 30.

In Fig. 4, the upper section 62a of the exhaust pipe 58a is formed with an upper obliquely cut end 80, which is cut off at an angle of approximately 50°. Such end 80 functions in the same manner as the opening 68.

In Figs. 5 and 6, the chamber 48a is mounted in a support 82 which also connects the chamber 48a with the tube 36a, which is constructed identically to the tube 36. The support 82 is provided for use where it is not desired to use the container 12 of Figs. 1-3. The support 82 includes a block 84 which has a vertical bore 86 formed therein and a horizontal bore 88 formed therein. The bore 88 extends through the front wall of the block and communicates with the vertical bore. The tube 36a has an end fitted in the bore 88, as shown in Fig. 5. The block has a counterbore 90 in its upper end and the lower end of the body member 52a is air-tightly fitted in the counterbore.

Oppositely extending lateral feet 92 and 94 project from the block and have flat bottoms which are coplanar with the flat bottom of the block and which rest on the bottom of the tank to support and stabilize the tube 36a and the associated exhaust tube assembly 58a and air tubing 72a, which tube assembly and tubing are identical to that of Figs. 1 and 3.

While the best known forms of my invention have been illustrated and described herein, other forms may be realized as come within the scope of the appended claims.

Having thus described this invention, what is claimed is:

1. Means for treating the water in an aquarium tank provided with a container adapted to rest on the bottom of a tank and to be embedded in the sand on the bottom of the tank, said container having a side wall formed adjacent its upper end with perforations and having filter material therein, said container also having another side wall formed with an opening adjacent its lower end, said treating means comprising a pipe adapted to be slidably disposed in the opening, gasket means enclosing the pipe adapted to fit in said opening, said pipe having an inner perforated end adapted to be disposed within the container at the bottom of the filter material, said pipe having an upstanding outer end portion, stabilizing means carried by the pipe adjacent its outer end portion and adapted to seat on the bottom of the tank, an air chamber fitted on the upper end portion of the pipe, means for conveying air under pressure to the chamber connected thereto, and a vertically disposed axially adjustable exhaust tubing mounted on the air chamber for conveying the admixed air and water from the air chamber and said exhaust tubing having an outlet means at its upper end for exhausting the water along the upper surface of the water.

2. A device as claimed in claim 1, wherein said air chamber includes a cylindrical body member having an open lower end, a base member having a central aperture and having a socket element depending therefrom concentric to the aperture and in which the upstanding end portion of the pipe is fitted, said base having an upstanding peripheral flange in which the lower end portion of the body member is fitted said body member having a tapered upper end portion terminating in a frusto-conical fitting fitted within the lower end of said tubing.

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