Oct. 9, 1962 J. WINKELMAN 3,057,094

WATERFALL FOR AQUARIUMS

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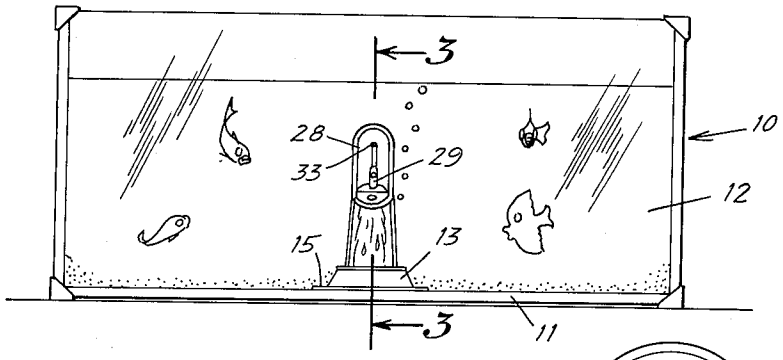


Fig. 1

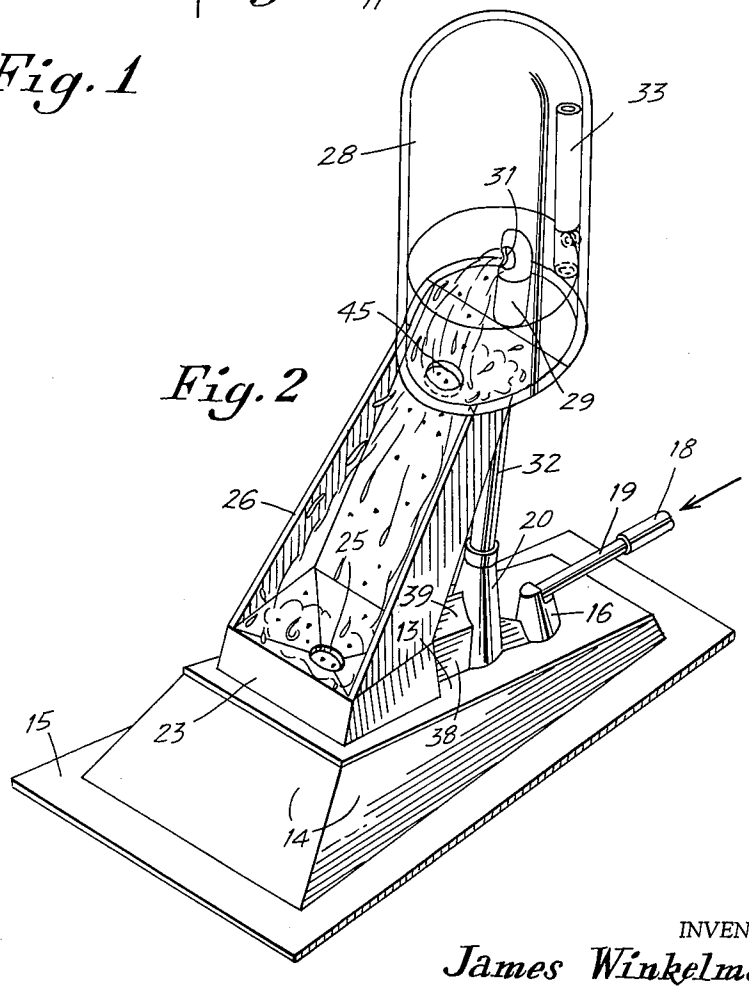


Fig. 2

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Fig. 3

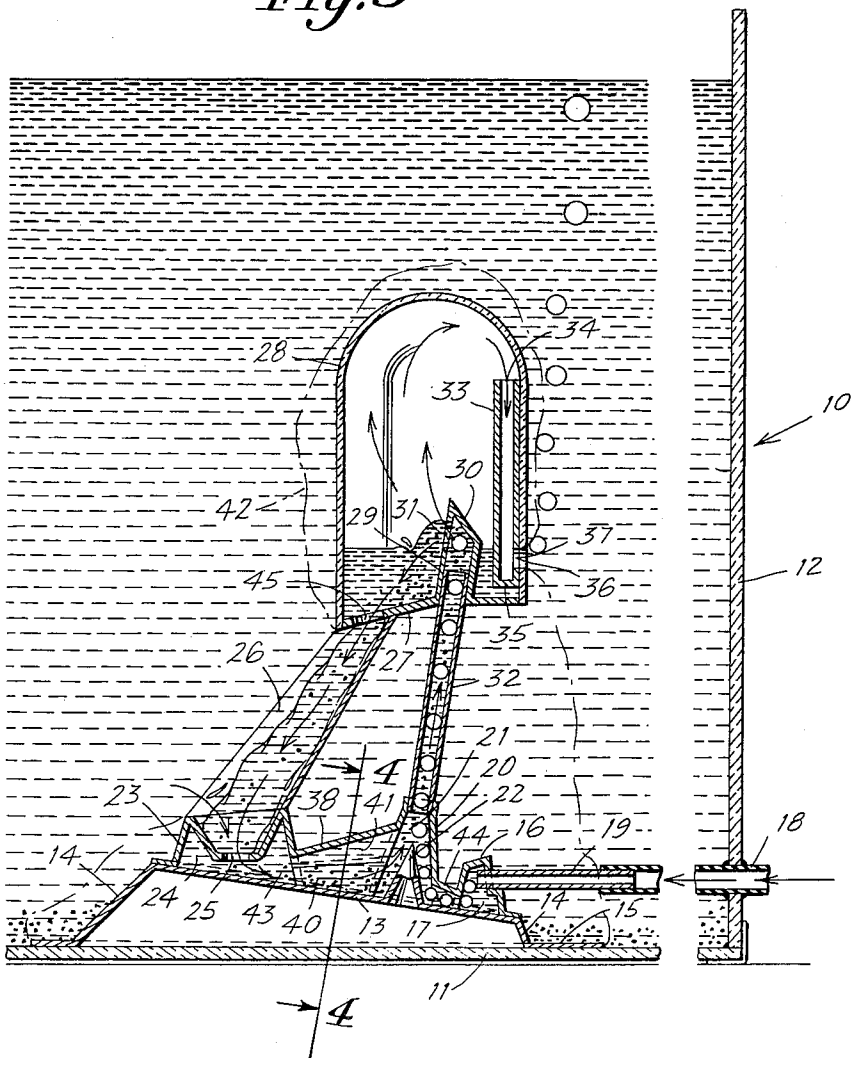
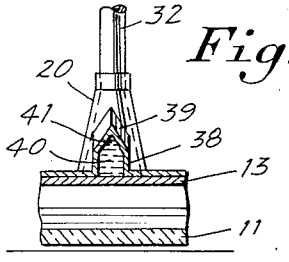


Fig. 4



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WATERFALL FOR AQUARIUMS

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The present invention relates to a waterfall for aquariums and it consists in the combinations, constructions and arrangements of parts herein described and claimed.

Generally there is provided a device which is operable by means of air received from a source such as an aerator tube from a source outside an aquarium. The device itself is adapted to be mounted in wholly immersed condition in an aquarium and may present an external appearance of a rock or the like. The device is adapted to lift a column of water admixed with sand or the like to an upper chamber from which air is allowed to escape. A channel, which is exposed to view, is provided for the downflow of the mixture of water and sand, the sand or other particles permitting such downflow of water to be visible to observers without the aquarium thus giving the impression of a constantly flowing waterfall under water.

It is accordingly an object of the invention to provide a device of the character set forth which is simple in construction, inexpensive to manufacture and yet effective and efficient in use.

Another object of the invention is to provide novel means for making visible a stream of fluid while the latter is wholly immersed in a fluid.

Still another object of the invention is to provide, in a device of the character set forth, novel means for maintaining a constant level of fluid in an air cap, such air cap and said means both forming parts of the invention.

A still further object of the invention is the provision of a novel mixing chamber forming a part of the invention.

Still another object of the invention is the provision, in a device of the character set forth, of novel means for the prevention of jamming of solids in certain passageways forming a part of the invention.

A still further object of the invention is to provide novel means for circulating in a given path solid particles in a fluid circuit.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawings, in which:

FIGURE 1 is a front elevational view illustrating an embodiment of the invention showing the same mounted in an aquarium,

FIGURE 2 is an enlarged perspective view of the device shown in FIGURE 1,

FIGURE 3 is an enlarged fragmentary sectional view taken substantially along line 3—3 of FIGURE 1, and

FIGURE 4 is a fragmentary sectional view taken along line 4—4 of FIGURE 3.

Referring more particularly to the drawings, there is shown therein an aquarium generally designated at **10** and provided with a bottom wall **11** and side walls **12**.

The apparatus embodying the present invention comprises a downwardly and rearwardly sloping base **13** provided with downwardly sloping side walls **14** from the lower edges of which extend a horizontal flange **15**.

A relatively small housing **16** provides an air entrance chamber **17**. A fitting **18** is provided in one of the walls **12** of the aquarium **10** and is connected on its outer side with a source of air (not shown) and upon its inner side with a tube **19** which, in turn, extends into the housing **16**.

Forwardly of the housing **16** and in spaced relation thereto there is mounted upon the base **13** a relatively large housing **20** preferably of a generally frusto-conical shape which provides a vortex mixing chamber **21** therein.

The bottom of the housing **20** is provided with an upwardly projecting centrally located conical member **22**.

A catch basin **23** is mounted atop the forward portion of the base **13** and is provided in the lower portion thereof with a collecting chamber **24**, the latter being connected with the upper portion through an opening or openings **25**.

A channel **26** interconnects the catch basin **23** with the bottom wall **27** of an air cap **28**. The bottom wall **27** is provided with an upwardly extending tubular portion **29** having at its upper end an upwardly and forwardly extending deflecting cap **30** and provided in its forward side adjacent the upper end thereof with an opening **31**. A tube **32** interconnects the upper end of the housing **20** with the member **29**. The cap **30** may, of course, extend in any direction.

An air escape tube **33** is vertically affixed to the rear portion of the inner wall of the cap **28** and is open, at its upper end, as indicated at **34** and is provided with a closed bottom, as indicated at **35**. Registering openings **36** and **37** are provided in the lower end portions of the tube **33** and the cap **28**, as indicated in FIGURE 3.

A conduit housing **38** interconnects the catch basin **23** with the housing and is provided with an inverted V-shaped top **39**, as indicated in FIGURE 4, thus providing a relatively wide lower channel **40** and a relatively narrow upper channel **41** therein.

The apparatus is preferably concealed with the exception of the forward portion of the channel **26** by a decorative covering such as is indicated in dotted lines at **42**. This may take the form of a rock or the like to conceal from view the actual working portions of the device so that all that is presented to view of an observer of the aquarium **10** and its contents is the ornamental cover **42** and the open portion of the channel member **26**.

In operation, sand or other like particles which are visible in water and, of course, of greater specific gravity than water, are introduced into the apparatus through, for example, the opening **25**. A flow of air from an aerator or the like will then pass through the fitting **18** and tube **19** into the housing **16**. It will then pass through a substantially conical passageway **44** whose narrower portion connects with the housing **16** and whose larger end is connected with the lower end portion of the housing **20**. During this passage the air will force some water into the mixing chamber **21**. The air will then pass upwardly into the channel or tube **32**. Additional water and sand or other particles will be drawn into the mixing chamber **21** by such upward passage of the air as aforesaid and the conical member **22** will create a vortex in the chamber **21** thus admixing the sand with the upwardly flowing water and air mixture. Such mixture of air and water will then pass into the member **29** and be deflected forwardly through the opening **31** by means of the deflector cap **30**. The mixture of sand and water will then pass by gravity through an opening **45** in the forward portion of the bottom wall **27** of the air cap **28** and thence pass downwardly in the channel member **26** to the catch basin **23** and thence pass through the opening **25**, passing rearwardly therein by gravity to again repeat the cycle.

It will be apparent that the stream of water admixed with sand passing downwardly in the channel member **26** will be visible to the observer due to the particles of sand or the like contained therein. It will also be seen that should particles collect in the lower channel **40**, that the flow of water through the upper channel **41** will act to help clear away any clogging of particles in the lower channel **40**. The conical or wedge shaped passage **44** has its smaller end toward the source of air. Thus, in the event of an air stoppage causing water to run into the air line, sand or other particles with irregular shapes will tend to jam at this narrow portion instead of being carried with

the water into the air line. Likewise, it will be apparent that should sand or the like collect in the member 44, it will be forcibly moved away therefrom by the passage of air entering the smaller end of the conical member 44. It will be seen that the positioning of the openings 36 and 37 will determine the water level within the cap 28.

It will be understood that wherever the term "sand" has been used herein that it includes any particles of matter having a specific gravity greater than the liquid in which the device is immersed and that where the term "water" is used, it includes any fluid which will cooperate with the particles in the manner set forth. Likewise, where the term "air" is used, it will, of course, include any other gases which will cooperate with the particles and fluid as set forth herein.

It will also be apparent that the device may be used for commercial display purposes.

While but one form of the invention has been shown and described herein, it will be readily apparent to those skilled in the art that many minor modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. An apparatus of the character described comprising a base, means defining a mixing chamber mounted on said base, a catch basin mounted on said base forwardly of said mixing chamber, a conduit interconnecting said basin and said mixing chamber, a closed air cap positioned above said mixing chamber and said basin, a channel member extending upwardly from said basin to the underside of said air cap, a tube interconnecting said mixing chamber and the underside of said air cap, said channel and said tube supporting said air cap, means providing a constant supply of air to said mixing chamber, and a supply of visible particles in said catch basin, whereby when said apparatus is immersed in a fluid, a circuit of particle containing fluid will flow successively through said mixing chamber, said tube, said air cap, said channel member, said catch basin and again to said mixing chamber.

2. An apparatus as defined in claim 1 wherein air escape means is provided in the rear portion of said air cap.

3. An apparatus as defined in claim 1 wherein means is provided for maintaining a constant liquid level in said air cap.

4. An apparatus in accordance with claim 1 wherein said conduit interconnecting said mixing chamber and said catch basin is provided with a relatively wide lower channel and a relatively narrow interconnected upper channel whereby to maintain said conduit free from accumulating particles.

5. An apparatus according to claim 1 wherein the bottom of said air cap is provided with an upwardly projecting cylindrical member having an upwardly and forwardly extending top wall and an opening in the forward portion thereof immediately below said wall, said wall acting as a deflector plate to direct liquid through said opening.

6. An apparatus as defined in claim 1 wherein said means for providing a supply of air to said mixing chamber includes a housing, an air supply tube connected to said housing, and a conduit interconnecting the housing with said mixing chamber.

7. An apparatus according to claim 6 wherein said last-mentioned conduit is conical in shape with its larger end connected to said mixing chamber.

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