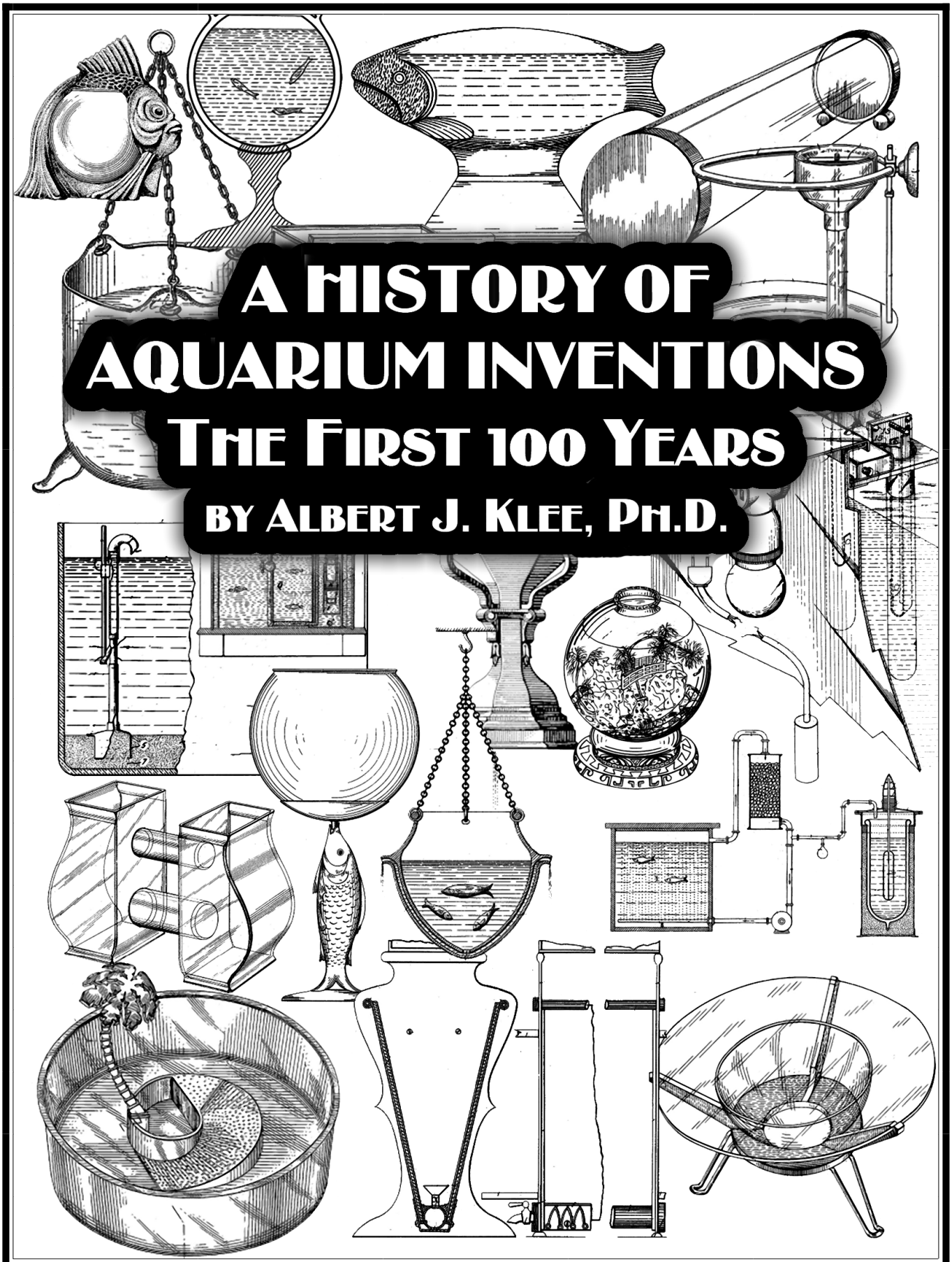


A History of Aquarium Inventions
The First 100 Years

By Albert J. Klee, Ph.D.

Dedicated to those unsung innovators whose names are forgotten but whose spirit of imagination lives with us in the advancement of the aquarium hobby.

James Ambrose Cutting, (1814-1867), who in 1861 was awarded the fourth U.S. aquarium patent.

AJK Publications
Milford, Ohio

"Go little book and since there is much great diversity in English and our writing is so young, I pray to God that none may mangle thee, or wrench thy metre by default of tongue; and wheresoever thou be read, I beg of God that thou be understood!"

Geoffrey Chaucer, *Troilus and Criseyde*

A HISTORY OF AQUARIUM INVENTIONS – THE FIRST 100 HUNDRED YEARS, 1858-1958

By Albert J. Klee, Ph.D.

This history of aquarium inventions fills a gap in our knowledge of the early aquarium hobby in this country by providing a look into the development of aquarium equipment. Our knowledge about the hobby in the 1800's, for example, is limited because this period predates aquarium societies, aquarium periodicals, and even most aquarium books. The periodical literature of the day – and much can be said of the books, as well - was sparse with regard to aquarium hardware and when it did occur, dealt mainly with starting an aquarium, not with the details of what was available at the time and certainly not with the personalities of the day. Without this history of invention we would not know, for example, about George Gunther of New York City, a prolific creator of items for the hobby who was clever and innovative, some of whose ideas were far ahead of their time.

Unfortunately, we do not know the fate of these inventions during their lifetime, whether they were actually manufactured and sold, and if so, if they met with commercial success. Equipment improves or is replaced over time. An invention may have been successful in its day but like most commodities, it becomes obsolete and is forgotten. It is not reasonable, therefore, to scoff at something that may have been useful in the past merely because we fail to place it in perspective today.

I started this venture quite by accident after discovering an early patent on an automatic fish feeding device. This started me thinking about other hobby inventions and ultimately led to a systematic search of U.S. Patent Office documents that pertained to the aquarium hobby. Most utility patents are accompanied by a great deal of descriptive material, and had to be distilled down into a brief paragraph - at times even a single sentence - in order to keep this book within reasonable limits. To assist those who may wish to examine these patents in greater detail, I have provided the patent numbers of those I have examined (these are given in the text as part of the references to figures, for example, Figure 22-534052 or Figure 68-D53157). With this code after the figure number, the reader can visit the U.S. Patent Office's web site to read the full description and view all of the accompanying drawings of each patent.

This venture has afforded me with much pleasure – a smile here or there at the more fanciful of these patents and a fascination with the imagination reflected in others. I hope the reader will enjoy learning about them as much as I did.

Albert J. Klee

January 4, 2007

CONTENTS

INTRODUCTION

Shakespeare once said (*A Midsummer Night's Dream*) "The lunatic, the lovers, and the poet, are of imagination all compact." To this we might add one more to the list, the innovative aquarist. In the aquarium world the next best thing to sliced bread is an idea that takes the aquarium world by storm. The aquarium hobby had its start in this country shortly before the issuance of the first aquarium patent was granted, and this book examines all of the patents awarded by the United States Patent Office between 1858 and 1958 that described concepts for tanks, accessories, and gadgets. Some were well thought out and useful for their time, others formed the basis for articles used in today's hobby, and some that if actually manufactured wouldn't have worked or else were just plain silly.

One ought to keep in mind that the development of an aquarium device did not necessarily start from scratch. In fact, many of these had their inception in a piece of equipment originally developed for other applications and later modified for use in the aquarium. The forerunners of aquarium filters, for example, frequently were purifiers for drinking water, and the antecedents of aquarium heaters often were devices built for boilers. One patent for an aquarium heater actually had its origin in a foot warmer!

One might reasonably expect that the inventors whose work we shall describe lived mainly in those cities noted for their early aquarium activity, such as New York City, Chicago, and Philadelphia, and, of the 231 patents described in this book, 31 are from New York City, 17 from Chicago, 17 from Philadelphia, and 10 from Brooklyn. Since Brooklyn became part of New York City in 1898, New York City with its grand total of 41 is clearly the winner over the period covered by this book. Although these cities make up almost one third of the patents, the hometowns of some of the others seem highly unlikely places to find innovators of the aquarium world.

United States patents (the term "patent" originates from the Latin word *patere* which means "to lay open," i.e. make available for public inspection) relevant to the aquarium hobby are of two types:

(1) Utility Patents. These are issued for the invention of a new and useful process, machine, manufacture, or composition of matter, or a new and useful improvement. It generally permits its owner to exclude others from making, using, or selling the invention for a period of up to twenty years from the date of patent application filing (for some of the earlier patents discussed in this book the period was only 14 years), subject to the payment of maintenance fees. The utility patents described in this book average about 4 pages, and both the text and the drawings are usually presented in quite a bit of detail.

(2) Design Patents. These are issued for a new, original, or ornamental design for an article of manufacture. They permit its owner to exclude others from making, using, or selling the design for a period of fourteen years from the date of patent grant, and are not subject to the payment of maintenance fees. In the context of this book they generally describe some sort of decorative aquarium (but not always) and typically consist of two pages, one containing a drawing of the design and the other a description that is not a description at all. This use of the term "description" with respect to design patents is very misleading since, in effect, all that it really says is, "the drawing is the patent." On occasion this is not enough to determine what the invention is or what it is designed to do. A case in point is the design patent assigned to Louis Feldman of New York City in 1951 and shown in Figure 1-D163377. The name of the patent is "Aquarium Unit," and the description reads, "…a new, original and ornamental Design for an Aquarium Unit…" However, what is this invention? Is it an aquarium? If so, where are the fish housed and what are the holes for? If it is simply something to be inserted into an aquarium as an ornament, then apparently anything can be patented as an "ornamental design," even a brick with a few holes in it! Of the 231 patents described here, 82 are design patents, identified by the letter "D" preceding the number.

This book covers the years from 1858 – the date of issuance of the first U.S. aquarium-related patent – to 1958, a period of 100 years (this is actually 101 years but the rounded appearance of 1858-1958 on

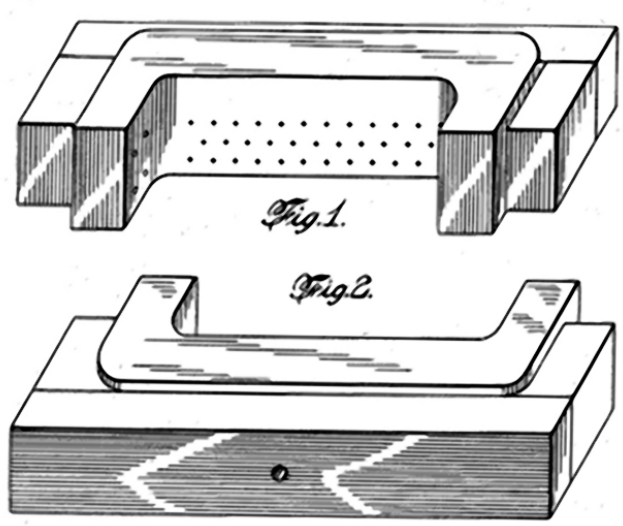


Figure 1. Described in the Design Patent as an "Aquarium Unit," but what is it really?

the title page seemed to me better proportioned than 1858-1957 ☺). It spans the period of three major conflicts - the Civil War, World War I, and World War II - and includes the start of the Industrial Revolution in this country to its post-World War II dominance throughout the world. Table I shows the number of aquarium patents issued in each decade of the period covered here. The first three decades started slowly and then accelerated in the next three. During the 1919-1928 decade the number of patents tripled, but it was the depression decade of 1929-1938 that witnessed a tremendous rise in the number of aquarium-related patents granted. The number understandingly fell dramatically during the decade containing World War II, but the last decade discussed in this book showed that the patent activity after World War II underwent a rapid recovery.

In the period discussed in this book, an average of 2.3 aquarium-related patents per year was issued; in the period 1974 to 2003, the average was 88 patents per year. The curious who wish to take up where this book leaves off will have to examine almost 3000 patents, a task I do not envy!

TABLE I
Number of Patents/Decade

1858-1868	6	1909-1918	16
1869-1878	6	1919-1928	31
1879-1888	6	1929-1938	74
1889-1898	10	1939-1948	13
1899-1908	13	1949-1958	56

THE EARLY YEARS: THE DECADE OF 1858-1868

The earliest American patent (Figure 2-21719) was awarded in 1858 to J. Chilcott and Jas. Scrimgeour of Brooklyn, New York for a method of making a water-tight seal in the vertical joints in an aquarium. An external L-shaped metal plate was connected via rivets to a flat interior metal plate, and India rubber ("or other elastic or yielding packing material") was placed between the glass and the plates. Cement ("wax and rosin or other suitable material") heated to a liquid was then poured into the hollow formed by the metal plates and India rubber and then allowed to harden, thus forming a water-tight seal. The bottom of the glass cage was placed into a grooved board ("wooden or metal") into which heated cement could be poured, thus sealing the bottom of the tank. As was typical of the aquaria of the time, there was no top frame. Although this is an effective way to seal the vertical joints, the major weakness was in the strength of the seal between the glass cage and the base.

The second U.S. patent (Figure 3-22019) also was awarded in the same year, this time to another Brooklyn inventor, Elijah D. Davis. This one, however, was quite different as it was designed to make an aquarium seem larger than it actually was. Davis incorporated a mirror into the back of the aquarium, higher than the front of the tank, "…so as to display to the eye of the spectator located in any planes between about forty and fifty degrees inclination above the center of the aquarium more than one reflected image of the objects in the water." Thus the breadth of the aquarium would appear to be increased to three or four times its actual size. Davis also incorporated a false bottom in his tank so that the plants and gravel could be lifted out without disturbing the plants.

The third U.S. patent (Figure 4-31040) was an aquarium designed to be mounted on a wall and was

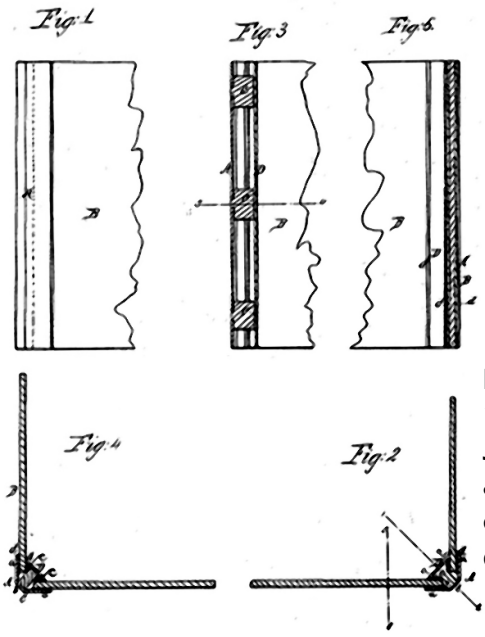


Figure 2-21719.
1858: J. Chilcott and Jas. Scrimgeour's aquarium construction design.

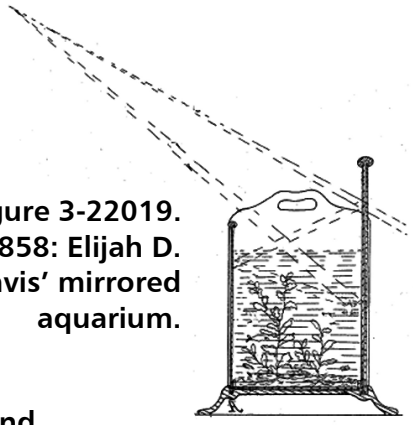
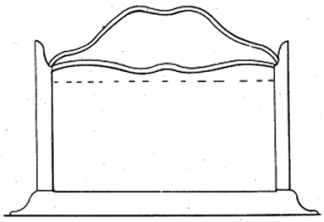


Figure 3-22019.
1858: Elijah D. Davis' mirrored aquarium.



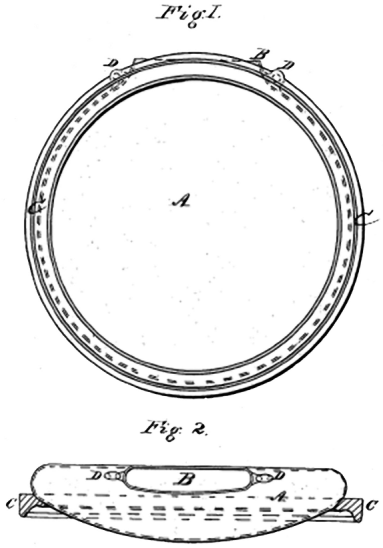


Figure 4-31040.
1861: Herrmann Schlarbaum's wall aquarium.

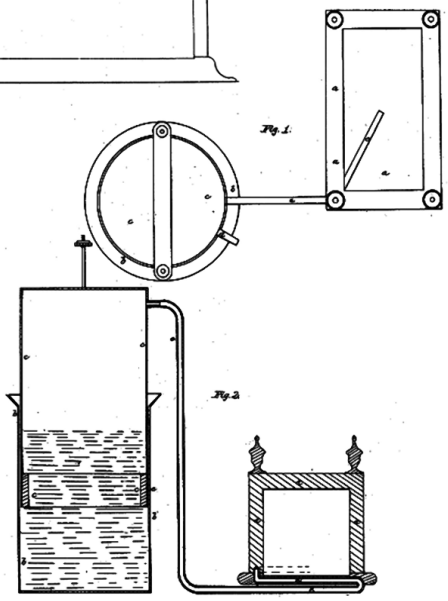


Figure 5-31657.
1861: James Ambrose Cutting's aerator.

Figure 6-D1988.
1864: George T. Palmer's combination aquarium and herbarium.

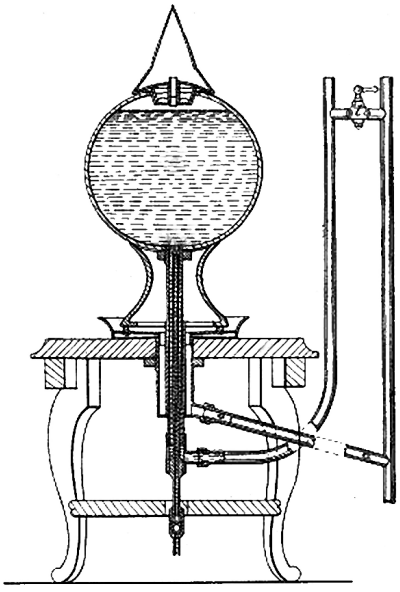


Figure 7-46801.
1865: Alfred Ivers's Flowing water fish globe.

granted in 1861 to Herrmann Schlarbaum of New York City. Since it is such an early patent, for historical reasons it is worthwhile to quote from his application: "At the present moment aquaria are very expensive, besides being rather clumsy, liable to leaks and accidents, and cannot easily find a place in the parlor, in consequence of which an extra stand or table must be consigned to them, often required for more needful things." In Schlarbaum's diagram, A is a flat, oval, or round vessel blown of clear glass placed in a suitable picture frame, C, and B is the opening in the top of the aquarium. Two screw eyes were attached to the glass tank itself so that the aquarium could be fastened to the wall. Being of limited size, wall aquaria would have been especially difficult to keep in this period, and the next wall aquarium patent would not appear until close to the end of the Nineteenth Century.

The fourth patent (Figure 5-31657) was awarded two months later in 1861 to a famous name in the history of the aquarium hobby, James Ambrose Cutting of Boston. This was an aerator made of glass and rubber tubing. The principle was similar to the gasometer or old-fashioned gas storage tanks of some years ago. The principle of Cutting's aerator can be explained as follows. Suppose, for example, that you invert a tumbler over a pot of water. The air inside is, of course, trapped, but if a hole were drilled in the end of the tumbler and a piece of tubing inserted to lead the air off into an aquarium, gravity would force the air out of the tumbler through the hose to the aquarium. This method for aeration was also adopted for use at Barnum's American Museum in New York City by Henry D. Butler. An interesting aspect of the drawing shows that the air was introduced by a tube that led directly into the bottom of the aquarium.

The fifth patent (Figure 6-D1988) was assigned in 1864 to George T. Palmer of Brooklyn, New York. This was a combination aquarium and herbarium pedestal, the aquarium forming part of the pedestal. This particular patent was almost lost and since the text is in faint handwriting it is almost impossible to read. However, as a design patent (the first aquarium design patent, in fact), the text would not have supplied any useful information anyway.

We'll complete this first decade of patents by examining the sixth one, awarded to Alfred Ivers of New York City in 1865 under the title of, "Improvement in Globes for Fishes," (Figure 7-46801). As Ivers stated: "The object of this invention is to supply water to the receptacle for fishes, and allow the same to pass away from the bottom after the water rises to a given height or to cause the water to flow away over the top and outside of the vessel." Water entered the fish globe (which had a pointed decorative cover) via the central vertical pipe located underneath. Its height in the globe depended upon the height of the cross-pipe located in the two vertical pipes shown on the right in the diagram. If the ball valve located in the cross-pipe were closed, however, the water would fill the globe and run over its outer surface where it was collected in a pan and then drained via the sloping pipe shown in the drawing. How much of an aesthetic effect was produced by water running over the outside of a fish bowl is anyone's guess. Since the device was never pictured in any aquarium book or mentioned in any article, we can safely assume that Ivers' innovation was not a best seller ☺!

POST CIVIL WAR: THE DECADE OF 1869-1878

The idea of combining a birdcage with an aquarium started with Leonhard Thurneysser around 1572 and surfaced again when Gilbert White described a variation in 1782 and Shirley Hibberd pictured another in 1856, but the first such patent in the United States was granted in 1875 (Figure 8-164074) to James Chase of Rochester, New York who combined an aquarium with a birdcage and a flower stand. The aquarium was square in cross section with a rectangular birdcage running through its center. Flowerpots were situated at each corner (in the drawing one of the flowerpots has been removed), and a fifth one was suspended in a basket that overhung the whole works.

Another complex birdcage design (Figure 9 – 192595) was patented in 1877 by Matthew Palen and Daniel Sexton of San Bernadino, California. This model was the height of ingenuity. The ends of an arch with a square cross section faced with glass were placed in two pans filled with water. All this

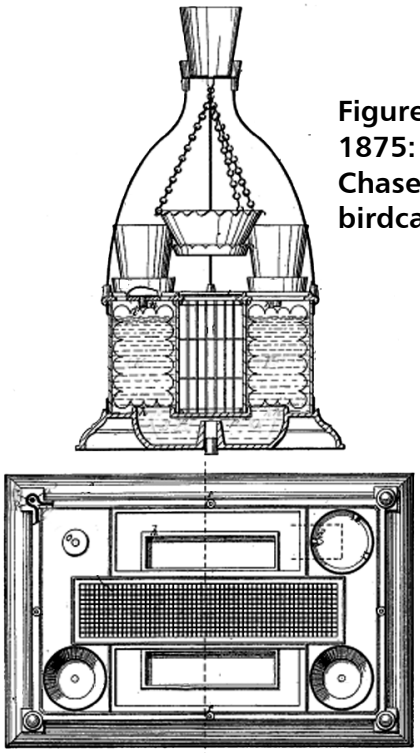


Figure 8-164074. 1875: James Chase's birdcage aquarium.

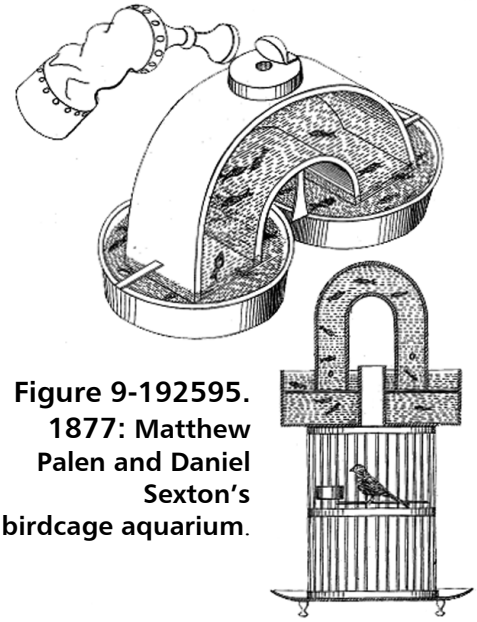


Figure 9-192595. 1877: Matthew Palen and Daniel Sexton's birdcage aquarium.

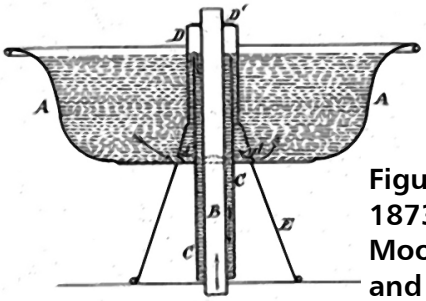


Figure 10-143456. 1873: Jonathan Moore's aerating and cleaning device.

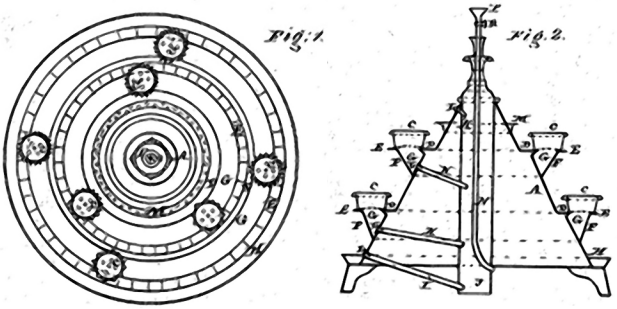


Figure 11-147849. 1874: Thomas Leslie's fountain aquarium.

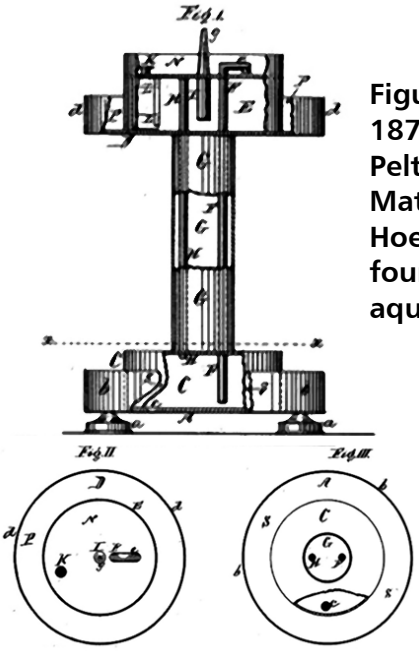


Figure 12-188941. 1877: Alphonse Peltier and Matthew Hoerning's fountain aquarium.

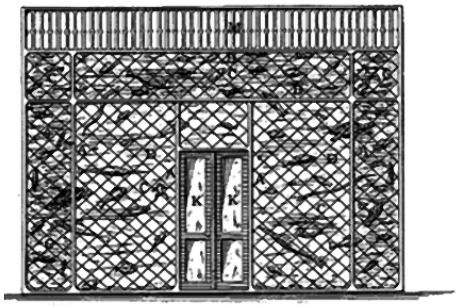
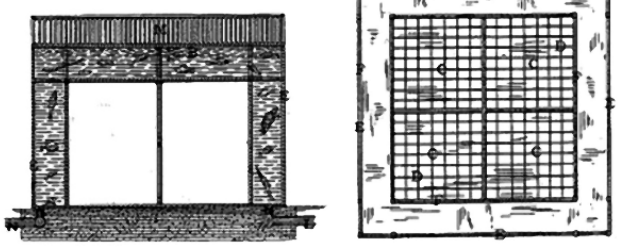


Figure 13-165639. 1875: Jerome Wenmackers' walk-through aquarium



was placed over the birdcage. An air pump was then attached to a one-way valve at the top of the arch and evacuated the air from the arch, allowing it to fill with water. The fish then were able to swim from the pans into the arch where they could be viewed simultaneously with the birds. Because of the difficulty of sealing an arch of this sort in those days, if such a device had been built I imagine that the canary would have also had a built-in birdbath ☺! This concept of a "fish bridge," however, would appear again in the 1930's.

A patent that combined aeration with cleaning was awarded to Jonathan Moore of Brooklyn, New York in 1873 (Figure 10-143456). The drawing shows a water supply pipe (B) entering the basin (A), the former being encased in an overflow pipe (C). The upper end of the water entry pipe is open. The entry pipe is enclosed in a chamber (D'), cone-shaped at the bottom and the top of which is partially open. There are openings in the overflow pipe at the base of the bowl (d). The water is aerated by the fall of the entry water from the top of the supply pipe, and overflow water escapes via pipe D, but since the water is drawn from the bottom of the bowl, accumulated sediment is drawn away as well.

During this period, two patents were issued that involved fountains. The first (Figure 11-147849) went to Thomas Leslie of Brooklyn in 1874 (Brooklyn supplied many aquarium inventors early on ☺!) and was a combination of fountain, aquariums and flower pots. This elaborate device consisted of a conical flower pot stand with water sprayed out at the top of the cone, keeping the flowers in their pots (C) well-supplied with moisture for their growth. Around the cone were water troughs or basins (G) in which fish were kept. Each of the basins received the overflow from the basin above, ultimately to be carried off by a wastewater pipe at the bottom. The second patent (Figure 12-188941) was awarded to Alphonse Peltier and Matthew Hoerning of Williamsburg, New York in 1877. This also was a combination aquarium and flower stand. The bottom external concentric area was meant to hold flowers, the topmost area (N) being reserved for fish. In practice, reservoir E was filled with water running into reservoir C via tube, compressing the air the air above the water in C, forcing the water through pipe F through the aerating nozzle into aquarium N. After a while the fountain would cease to run and the excess water had to be removed and reservoir E refilled to start the process over. This was, of course, time-consuming and the fountain could not have run for very long.

The last patent of this period was far ahead of its time. This was the brainchild of Jerome Wenmackers of Philadelphia who in 1875 invented the first walk-through aquarium (Figure 13-165639). Wenmackers envisioned a space surrounded by an aquarium into which people could walk and observe the fish. Incorporated into the design was a system of supporting the plate glass pieces by a metallic network. Since the metal mesh also covered the top of the building, Wenmackers suggested that people could also walk on the top and view the fish below their feet. The idea was untenable at the time since the weight of the water was such that the metallic network could not relieve the stress upon the glass. In short, a person would literally be risking life and limb by venturing into its interior (or, for that matter, walking on its roof), assuming that the structure would still be standing once it was filled with water. Nonetheless, the walk-through aquarium was finally implemented successfully towards the end of the Twentieth Century when the technology of high strength plastics became available.

EDISON INVENTS THE ELECTRIC LIGHT BULB: THE DECADE OF 1879-1888

Wenmaekers also created the much more elaborate and practical public aquarium design shown in his 1885 patent (Figure 14-324508). This was a three-story "Combined Aquarium and Maritime Theater," incorporating a stage (C) and an aquarium in front of it. The first story contained the entrance, a restaurant, and miscellaneous rooms used for various purposes such as the display of scientific objects and children's attractions. The second and third stories were used for the theatre, the aquarium being located on the second floor. Seats were provided in the auditorium (D) and in the surrounding orchestra section. The aquarium (B) was connected to a U-shaped

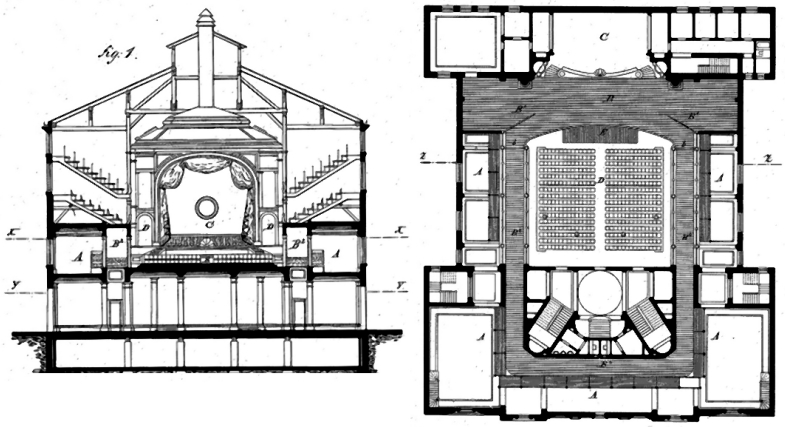
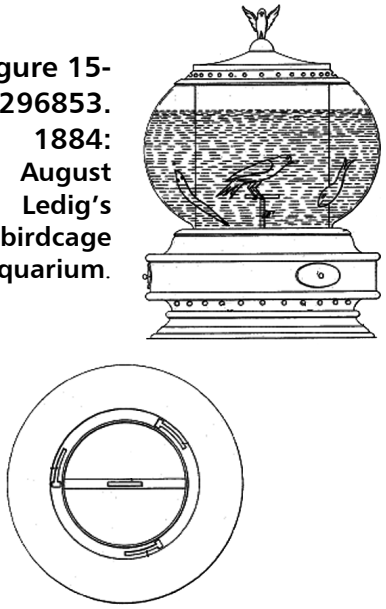


Figure 14-324508. 1885: Jerome Wenmackers' aquarium and maritime theater.

Figure 15-296853. 1884: August Ledig's birdcage aquarium.



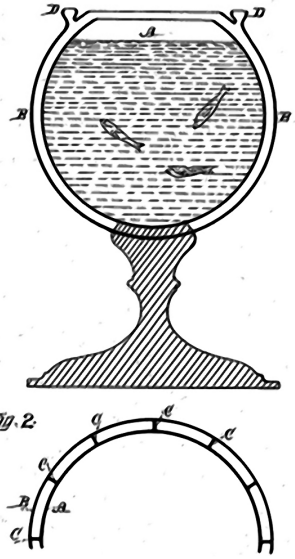
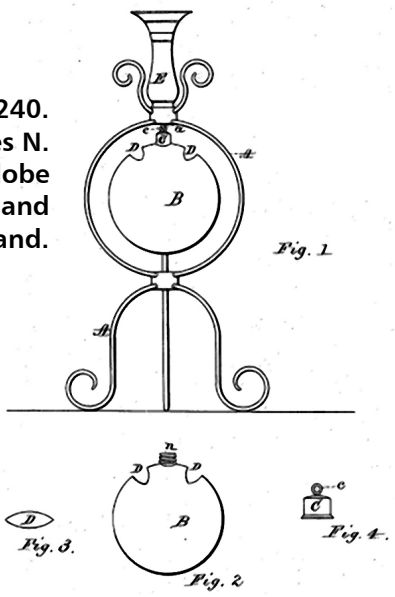


Figure 16-233435. 1880: George P. Ross and Plutaroo Vallejo's double walled globe aquarium

Figure 17-256240. 1882: Charles N. Orpen's globe aquarium and stand.



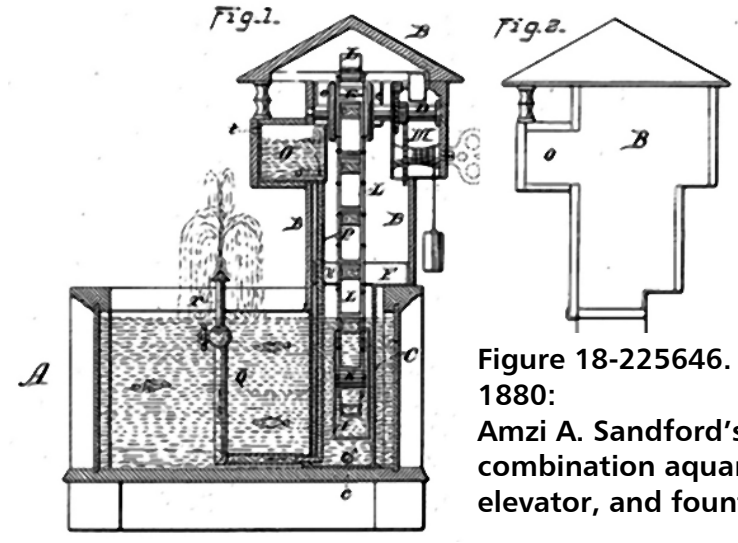
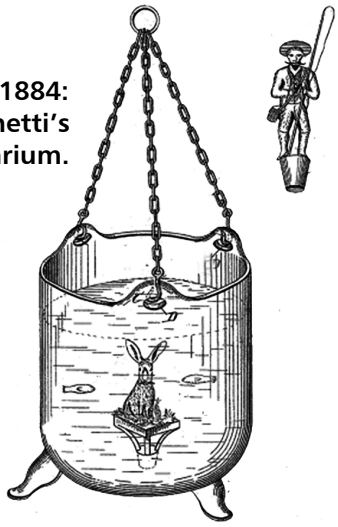


Figure 18-225646. 1880: Amzi A. Sandford's combination aquarium, elevator, and fountain

Figure 19. 1884: Fortonato Zanetti's hanging aquarium.



channel (B') that extended below the galleries. The bottom of the tank was constructed of thick slabs of glass that formed the ceiling of the restaurant situated below so the patrons could look up and watch the fish while they were eating. This was an ambitious proposal indeed, although I am not sure that I would like to be one of the first restaurant customers with so much water over my head ☺!

Another birdcage aquarium patent surfaced during this period, the much simpler design (Figure 15-296853) issued in 1884 to August Ledig of Philadelphia. This consisted of a round fish globe with a glass cylinder in the middle where the bird was kept. The fish globe could be slipped off the cylindrical birdcage for cleaning. Access to both the aquarium and to the birdcage was via a removable lid at the top, and seed for the bird was placed in openings at the bottom of the fish globe.

Two globe-type aquariums were patented during this period. The first was a double-walled aquarium (Figure 16-233435) by George P. Ross and Plutaroo Vallejo of Bristol, Nevada in 1880. The purpose of the double-wall was to contain colored water "to give a peculiar or attractive appearance to the contents of the globe or vessel." A more practical aquarium but rather ornate one was that of Charles N. Orpen of New York City in 1882 (Figure 17-256240). Openings (D) provided access to the globe, and plants could be placed in the receptacle, E.

The first real novelty aquarium was patented in 1880 by Amzi A. Sandford of Mont Clair, New Jersey (Figure 18-225646). This was a combination aquarium, elevator, and fountain but in reality the principle was rather simple. The elevator was powered by the same sort of weights found in a cuckoo clock, and moved an endless chain of buckets that picked up water from the aquarium and dropped it into a tank (O) at the top. The water then flowed back down into the aquarium via gravity through a pipe that was bent back at two right angles, leading to a nozzle that spurted the water upwards. The difference in height between that of tank O and the aquarium was sufficient to provide enough pressure to form the fountain spray. The elevator was enclosed in an attractive miniature building that hid the mechanism. If I had a choice of antique aquaria, this is the one I would most like to have in my collection.

Hanging aquaria over one's head like the Sword of Damocles seems to have been a popular pastime in the Victorian era. In 1884 Fortonato Zanetti of Bryon, Texas patented the one shown in Figure 19-295218. One of the interesting features of this model was the plug at the bottom that served as a drain. Zanetti envisioned colored ceramic ornaments at the top of these plugs and he illustrated two of them, one a rabbit and the other a fisherman ☺!

THE WESTERN INDIAN WARS COME TO AN END: THE DECADE OF 1889-1898

Patents for wall and hanging aquariums were also granted during this period. In 1899 a hanging model designed by George Gunther of New York City incorporated a method to remove sediment from the tank without disturbing the fish (Figure 20-415506). The hanging globe was double-walled, opened to each other by a hole at the bottom where sediment collected. When cleaning time arrived, the hanging tank was taken down and placed onto a special holder in a pan. When water was added to the globe, it forced the dirty water into the outer wall where it overflowed through two drainage holes, taking the sediment with it. The dirty water spilled over into the pan as shown.

A picture frame wall aquarium was the subject of Ernst Lochman's 1892 design (Figure 21-475404). Although from Gohlis-Leipsic Germany, his was an American patent. The frame was rather ornate, as was the insert consisting of stones and shells fastened to the rear of the aquarium. However, this patent was an exception for the time since it wasn't until the early 1930's that patents for wall aquariums arrived anew on the scene. Lochman specified that the aquarium be made of iron or brass, a poor choice of materials because of rust and toxicity problems, respectively.

In 1895 Louis Ruhe of New York City described a method of constructing an aquarium (Figure 22-

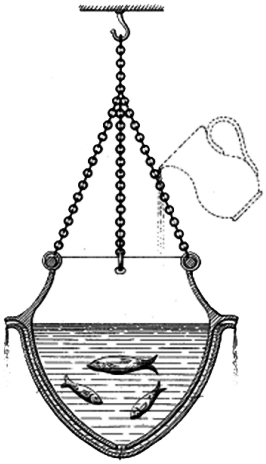


Figure 20-415506. 1899: George Gunther's hanging aquarium.

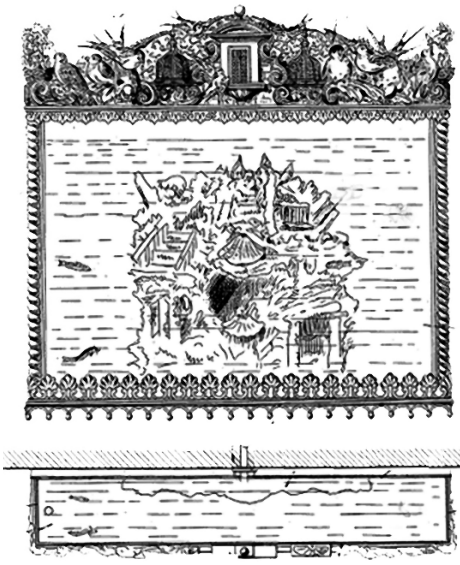
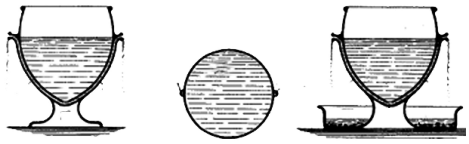


Figure 21-475404. 1892: Ernst Lochman's picture frame aquarium.



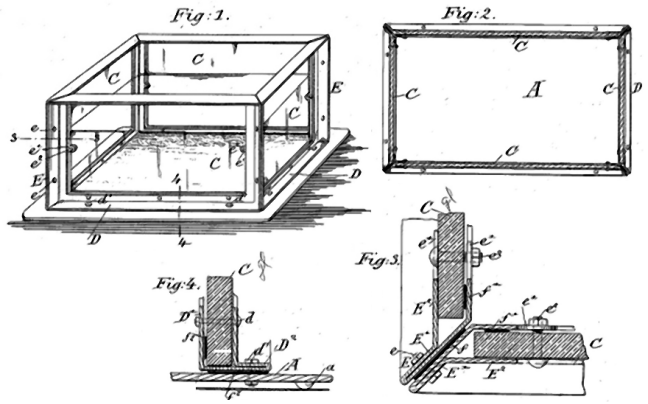


Figure 22-534052. 1895: Louis Ruhe's aquarium construction.

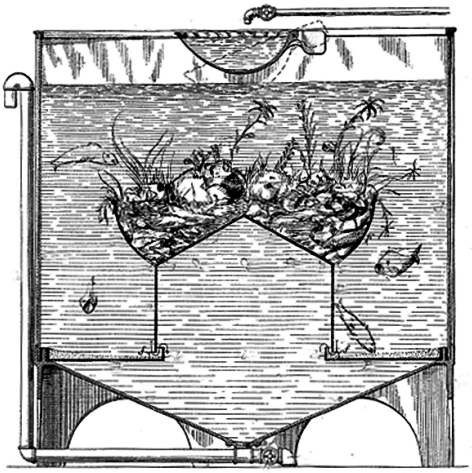


Figure 23-460809: 1891: George Gunther's self-cleaning aquarium.

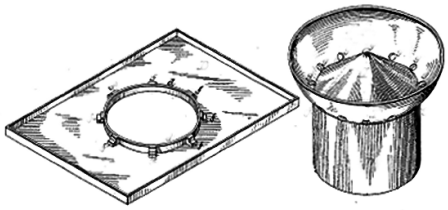


Figure 24-460810: 1891: George Gunther's sediment collector and plant rack aquarium.

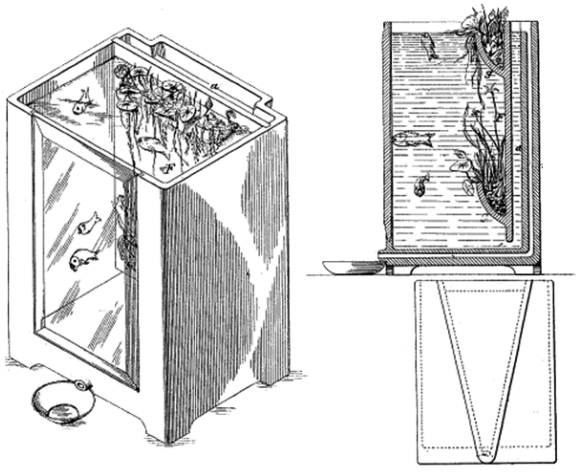
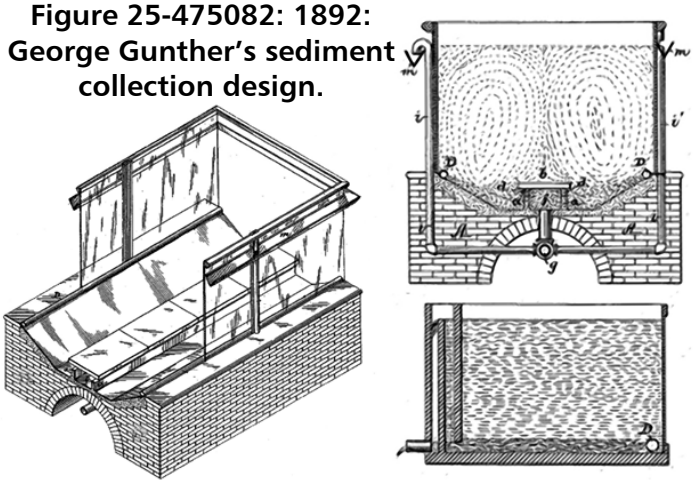


Figure 25-475082: 1892: George Gunther's sediment collection design.



534052) similar to that of Chilcott and Scrimgeour's 1858 design. An exterior flange and two interior flanges were positioned at each corner and elastic packing strips were placed between the flanges and the glass. The assembly was held together by bolts drilled through both the flanges and the glass. The major differences in this design was that, in addition to the packing material not being heated, the flanges were made so that the aquarium could be easily disassembled for transportation and shipped in a "knock-down" position. Another improvement was that the flanges used on the bottom were securely fastened to the bottom using similar bolts.

There were five inventions issued between 1891 and 1895 that concerned keeping the aquarium clean, all based upon the principle of removing the water at the bottom of the tank where the sediment accumulated. All of these patents were awarded to George Gunther who had patented the hanging aquarium mentioned previously. However, since his hanging aquarium had important cleaning aspects, it might be said that aquarium cleanliness was at the heart of all of Gunther's inventions. His first patent in this set (Figure 23-460809) was his design of 1891. The bottom of this tank was conical, the fish being excluded by a horizontal plate into which was placed a cylinder containing a pan with an inverted cone (the inverted cone and pan was for the placement of rockworks and plants). Sediment dropped to the horizontal plate where it passed through openings in the cylinder and then into the cone. When water was introduced at the top of the tank, the dirty water in the cone was forced out into a drainpipe.

Combining plants and aquaria was also a fertile ground for ideas. In this same year Gunther patented an idea for an aquarium that had a removable back that contained pockets for plants (Figure 24-460810). His design was a bit more complicated than his previous one, however, in that behind the plant wall was a space that communicated with a V-shaped chamber at the back of the tank. The chamber had a drainpipe that led to a collecting vessel at the front of the aquarium. When new water was added to the tank, the older water flowed under the plant wall to the top of the tank and spilled over into the V-shaped chamber. The V-shape served to concentrate the sediment that then was discharged to the front collecting vessel. Another of Gunther's self-cleaning aquariums, patented in 1892 (Figure 25-475082), involved using water to generate a specific flow pattern that would drive the sediment to troughs where it would build up and be removed.

Perhaps the most interesting of all Gunther's variations on this theme was his 1895 patent (Figure 26-546882) that incorporated a false bottom in the tank. The false bottom was smaller than the real bottom, allowing water with sediment to accumulate under it. The false bottom contained a tube capped at the end at the water surface and within it was an overflow tube open at its end under this tube. Whenever freshwater was added to the tank, water – with its sediment- would flow from under the false bottom up and into the overflow tube where it was carried away. When one thinks about it, Gunther had very nearly invented the undergravel filter… close but no cigar ☺!

Gunther's last invention (Figure 27-546883), also awarded in 1895, was probably his most ingenious. Water exited the aquarium through a pipe at the bottom into a vessel, D. The vessel contained the filter shown in the drawing at the bottom. A box, F, was situated around the ascending pipe that led from D, the purpose of which was to hold ice water to cool the water in the aquarium if it became too warm. At the end of the pipe was a pump barrel that extended over the tank, the other end being connected via a lever to a series of gears powered by a weight, an engine similar to the one used in Sandford's 1880 elevator aquarium. However, Gunther also specified that either a spring or electrically-drive motor could be used for this purpose, making this the very first powered aquarium air pump that combined both filtration and aeration, a milestone indeed. Quite an aquarium equipment pioneer was George Gunther ☺!

Advanced aquarium technology came sooner than most aquarists realize. Figure 28-597249 shows an aquarium that was patented by Peter Smith of New York City in 1898. An auxiliary tank of somewhat smaller size was placed over the exhibition tank and water was drawn from the latter to the auxiliary tank

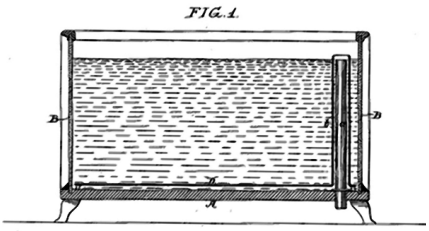
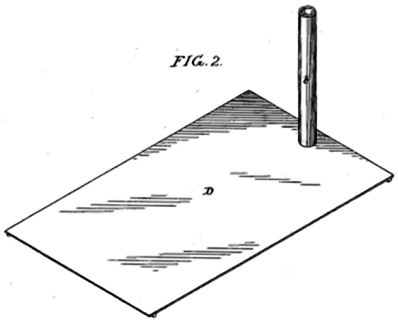


Figure 26-546882. 1895: George Gunther's false bottom aquarium.



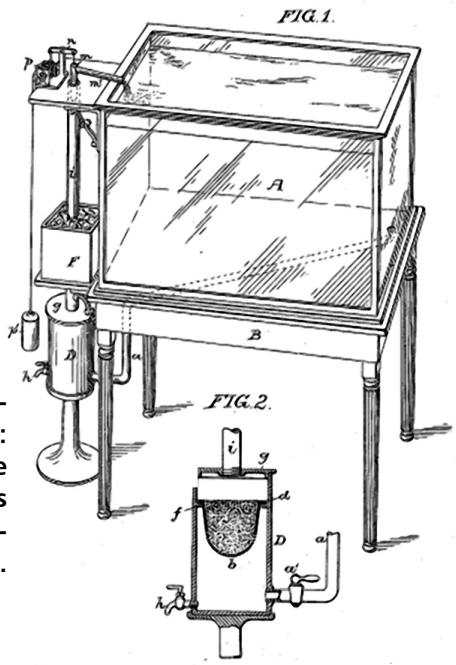


Figure 27-546883. 1895: George Gunther's clockwork-operated filter.

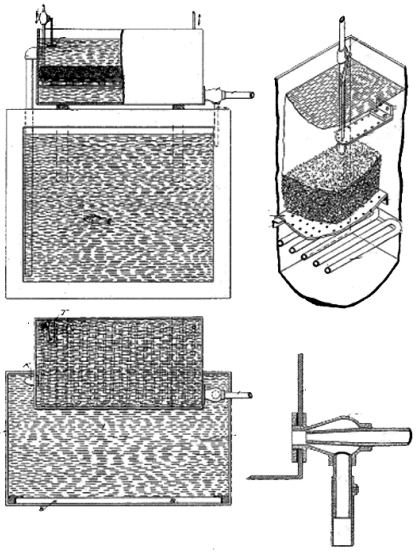


Figure 29. 1898. Francis G. Richmond's shipping can.

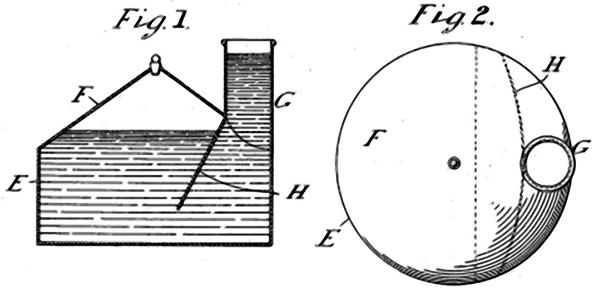


Figure 28-597249. 1898: Peter Smith's aeration, filtration, and heating design.

Figure 31-649494. 1900: George W. Sues' Sediment settling design.

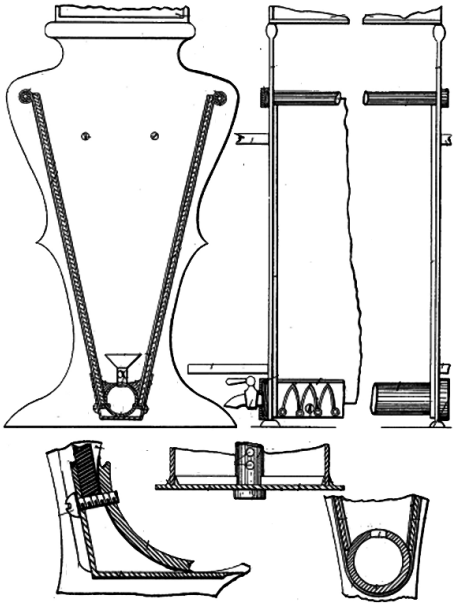
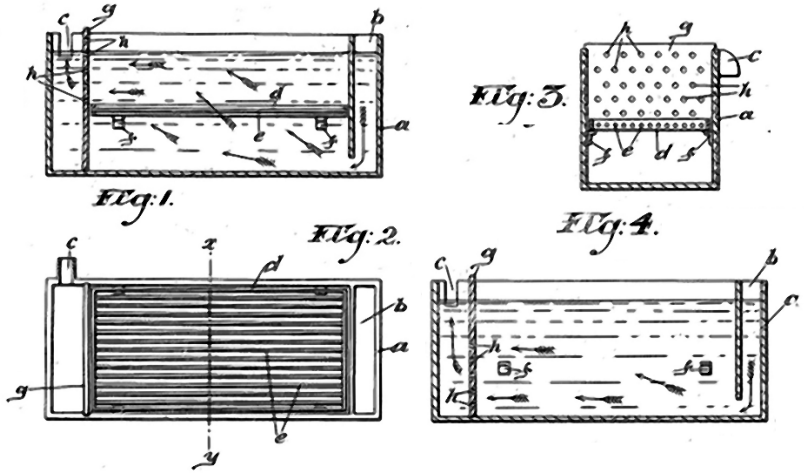


Figure 30-680838. 1901. Henry Bourgeois's breeding trap and haven for small fishes.



by an injector (of the type ordinarily employed with steam pressure to transfer water) driven by compressed air, during which the water was well aerated. The water then dropped by gravity back into the exhibition tank. The auxiliary tank was divided into two sections by a horizontal perforated plate. Above the plate was the filtering medium and below it was a coil (D) through which passed heating/cooling water of a suitable temperature to regulate the water returning to the aquarium. At the very left-hand top of the auxiliary tank was a bi-metallic thermostat that controlled the flow of the heating/cooling water. A detail of the injector is shown in "Fig. 3" in the diagram, a magnification of this corner of the auxiliary tank. All this was high technology for 1898 ☺!

We leave this decade by examining a device (Figure 29-613528) for the transportation of fishes. The invention was the brainchild of Francis G. Richmond of Braunton, England and is essentially a variation on the so-called "German shipping can" that was, as a matter of fact, an invention of an Englishman, Frank Buckland. At the side of Richmond's 1898 shipping can was a column (G) open at the top with the partition H inclined inwardly so as to lessen the splashing of water inside and to prevent the escape of oxygen should the spout G be casually tilted upward. The can was filled with water until the level reached the top of the partition. It was then filled with oxygen via the valve at the top. Additional water could be placed in the can, partially compressing the oxygen. The importance of this patent is not in the re-design of the standard shipping can, but in the fact that oxygen was mentioned in the shipment of aquarium fishes for the first time in a patent.

THE PRESIDENCY OF THEODORE ROOSEVELT: THE DECADE OF 1899-1908

The first U.S. patent for a breeding trap was awarded in 1901 to Henry Bourgeois of Tourouvre, France (Figure 30-680838). The device contained a movable grid of glass rods so that the fry could escape below, but it also incorporated a plate (half of which was perforated) at one end that admitted fresh water. If eggs were to be placed on the rods, then the plate was positioned with the holes on the topside so that the current flowed over the eggs; when the fry hatched, the position of the plate was reversed with the holes on the downside so now fresh water circulated at the bottom, providing them with a constant change of water.

Several patents for cleaning an aquarium were awarded during this decade, the first of which was conceived in 1900 by George W. Sues of Omaha, Nebraska (Figure 31-649494). A variation of the settling technique, Sues' aquarium had two end panels of the aquarium (made from any suitable material, a scrolled design being shown in the Figure) separated by two pieces of glass (held together by tie rods) and angled so that they met at a V at the bottom. The sediment gravitated to the bottom where it was removed by a draw-off valve. An interesting patent was awarded in 1889 (Figure 32-634626) to Albert J. Park of Worcester, Maine that incorporated the settling technique into the typical fish globe of the time. This involved placing a horizontal partition (C) in the bottom of the globe somewhat similar to Gunther's false bottom patent of 1895. The partition left enough room along its sides for sediment to collect at the bottom of the globe. Once the sediment accumulated at the bottom, the partition prevented sediment from bring drawn up again into the globe.

In the 1908 water regeneration invention of Georg Erlwein and Ernst Marquardt of Berlin, Germany (Figure 33-880783), water was drawn from the tank and taken to a reservoir (2 in the diagram) filled with lime where carbon dioxide was removed. The water was sent back to the tank using the motor (9), and along the way air or oxygen was added from the apparatus shown in vessel 3.

Figure 34-867112 shows an "Automatic Aquarium and Flushing Device" patented in 1907 by Mark Connor of Los Angeles. Although it looks complicated, it is actually quite simple. The long pipe that enters at the bottom of the tank and extending some distance above it is a water supply pipe. The two horizontal attachments at the top are plates over which the water flows, much like a cascading fountain. The shorter pipe to the right of the longer one is the outlet pipe. At its top is a siphon chamber that

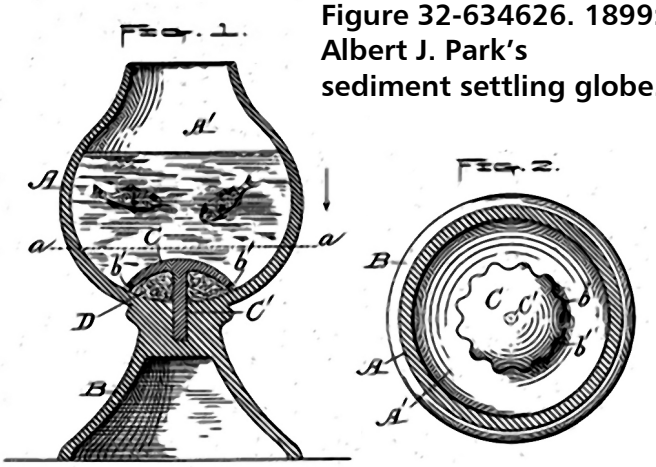


Figure 32-634626. 1899: Albert J. Park's sediment settling globe.

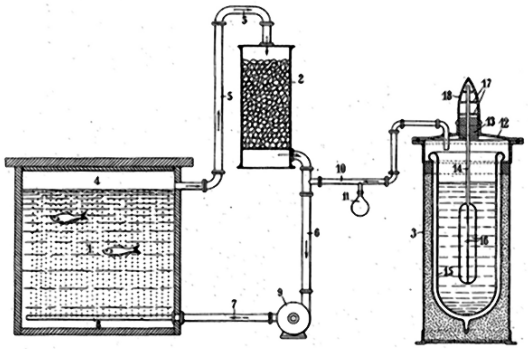


Figure 33-880783. 1908: Georg Erlwein and Ernst Marquardt's water regenerator.

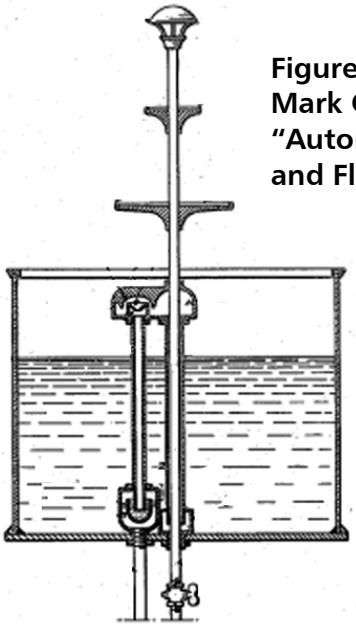


Figure 34-867112. 1907: Mark Connor's "Automatic Aquarium and Flushing Device."

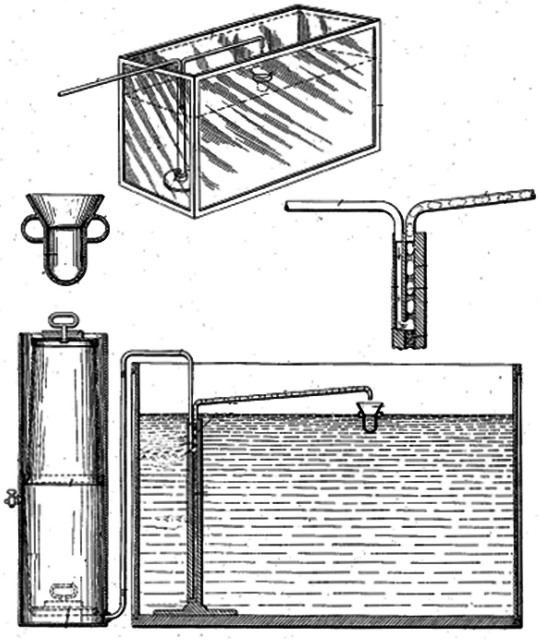


Figure 35-9894056. 1908: Henry Austin Rogers'? airlift.

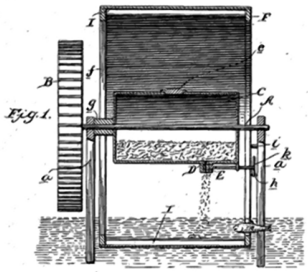
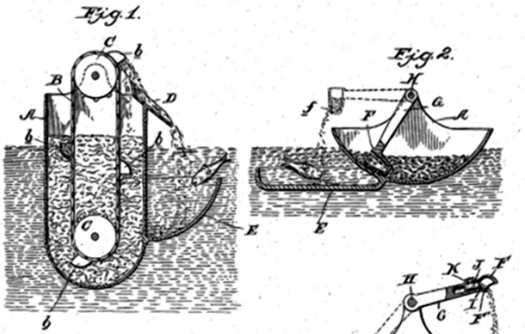


Figure 36-742415. 1903: Henry S. Hale's automatic feeder.



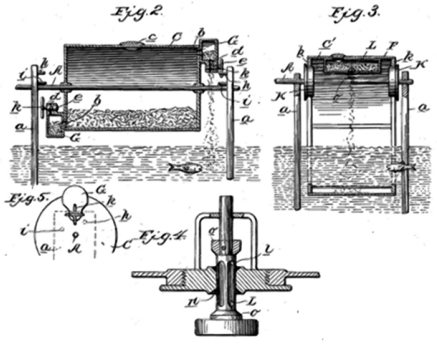


Figure 37-848101. 1907: Henry S. Hale's second automatic feeder patent.

maintains a constant water level in the aquarium. The main object of the invention was to "… provide an aquarium in which the water will be automatically renewed or replenished so that so that it will always be fresh." By providing the plates on the inlet pipe, the entering water had a chance to adjust to the temperature of the aquarium water so that the fish would not be subject to an abrupt change.

In 1908 Henry Austin Rogers of Pagosa Junction, Colorado patented an interesting variation on the air lift (Figure 35-894056). The air came from a cylinder filled manually using a hand pump. The air/water mixture was returned to the tank above the water level, thus increasing the aeration. The water ultimately emptied into a floating strainer that served as a small filter.

During this period, Henry S. Hale of Philadelphia patented two automatic fish feeders. The first was in 1903 (Figure 36-742415) and utilized a rotating drum partially filled with food. A discharge container was built into the drum, and Hale showing three different versions where this could be located. When the drum rotated, it filled the discharge container with food that was then pushed out into the aquarium via a measuring valve (Fig. 4 in the diagram). In 1907, Hale obtained a new patent (Figure 37-848101) that showed several designs that actually extended into the water. Fig. 1 in the diagram shows a continuous scoop bucket design; Fig. 2 and Fig. 4 show rotating scoop-arm devices, and Fig. 3 shows a variation on the continuous scoop bucket design. All of these variations save Fig. 3 had provisions to catch the food below the water's surface, thus making it easier for the fish to feed and minimized spreading food all over the tank. In neither patent does Hale specify the power source, although both clockwork and electric motors were available at the time.

Also issued during this period were three patents for various aquarium designs. The first two appeared in 1902, one by Samuel E. Creasey of Sanford, Maine, the other by Frederick R. Gillinder of Philadelphia. Creasey's "Aquarium Jardinière" (Figure 38-692832) combined a globe, a pedestal, and a removable flowerpot in its top. Gillinder's design (Figure 39-715571) had the holder for aquatic plants built in. The aquarium patented by Frank Hundorf of Covington, Kentucky in 1904, on the other hand, was a traditional fountain design (Figure 40-D37181).

Two fish transportation patents were awarded during this period. The first was in 1902 to Max Kern and Alfred Wiget of Zurich, Switzerland (Figure 41-710325). This was a shipping can that had a con-

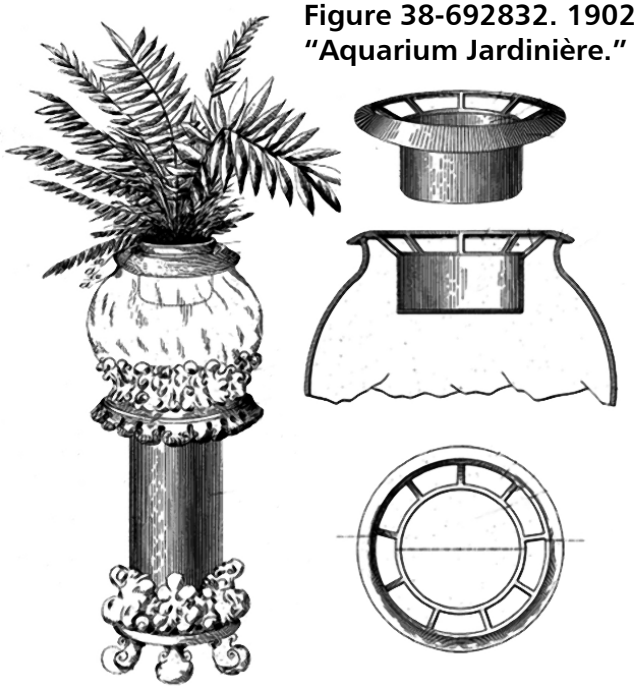


Figure 38-692832. 1902: Samuel E. Creasey's "Aquarium Jardinière."

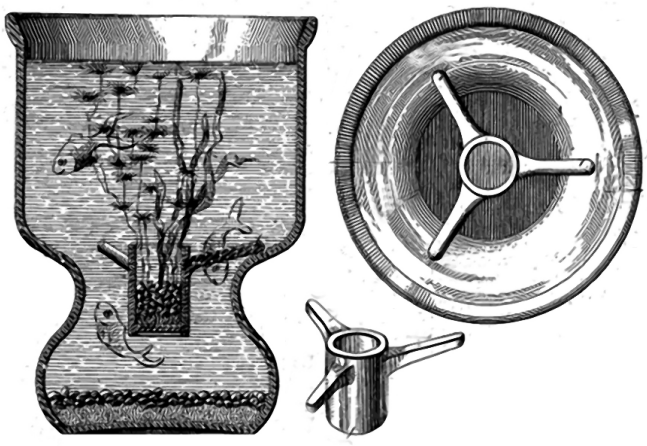


Figure 39-715571. 1902: Frederick R. Gillinder's aquarium with removable flowerpot.

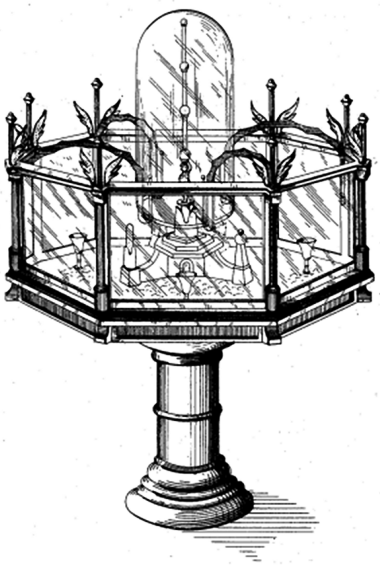
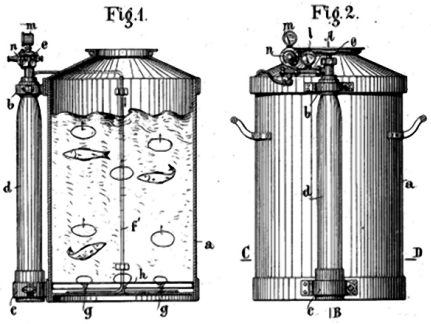


Figure 40-D37181. 1904: Frank Hundorf's fountain design.



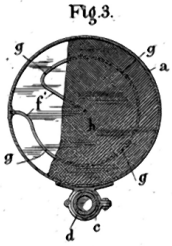


Figure 41-710325. 1902: Max Kern and Alfred Wiget's fish transporter.

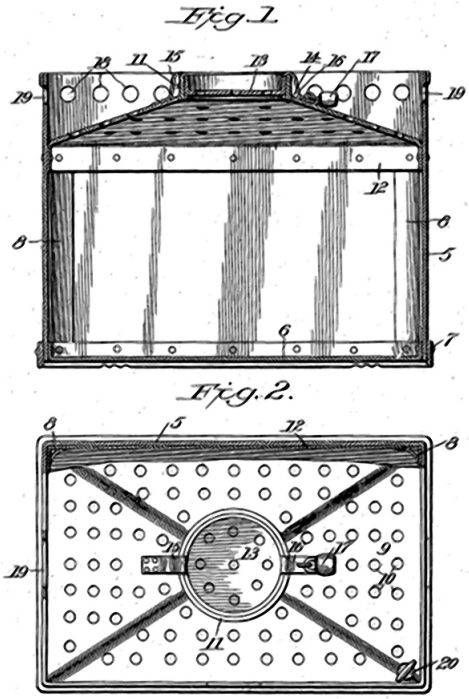


Figure 42-846864. 1907: Charles J. Remsburg's shipping can.

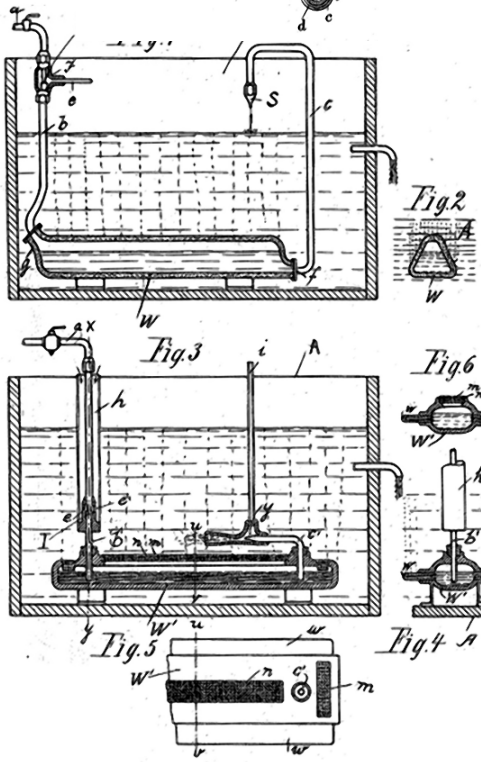
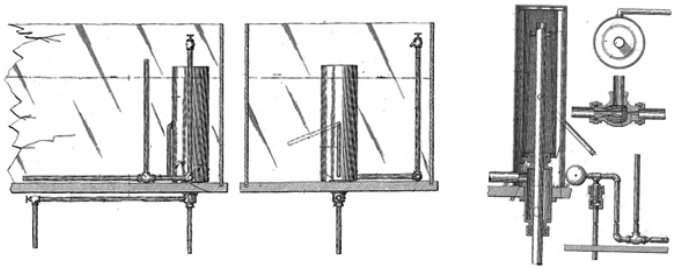
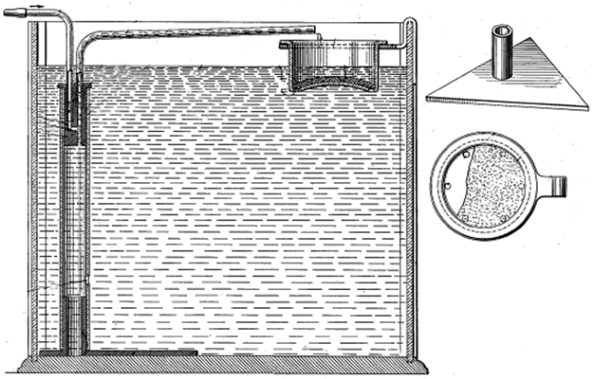


Figure 43-950999. 1910: Georg Erlwein and Ernst Marquardt's aerator.

Figure 45-1055082. 1913: Henry A. Rogers' aerator and filter.

Figure 44-976242. 1910: John F. Wohlfahrt's aeration system.





tainer of air or oxygen fastened to its side, the gas being introduced into the bottom of the can. Oddly enough, nowhere in the patent is there an explanation of how the excess gas escaped from the can ☺! The second patent was awarded to Charles J. Remsburg, of Lewistown, Maryland in 1907. Remsburg's design (Figure 42-846864) had two aims: (1) to minimize the splashing of water during transport by the use of a perforated cover on the can, filled to its very top so that the water could not splash, and (2) to minimize the wasted space when the cans were placed alongside each other by use of a rectangular design. In the diagram, the perforated ring around the top of the can allowed air to find its way to the perforated cover when the cans were stacked on top of each other.

WORLD WAR I: THE DECADE OF 1909-1918

Three designs for aerating aquariums were assigned during this decade. The first two appeared on the scene in 1910, one by Georg Erlwein and Ernst Marquardt of Berlin, Germany and the other by John F. Wohlfahrt of St. Louis, Missouri. In the Erlwein/ Marquardt design (Figure 43-950999), I is the water-jet injector that forced the air/water mixture into the porous vessel (e.g., porous cement, porous porcelain, or porous wood), W. The water escaped out pipe c and out through the nozzle, S, carrying with it small bubbles of air. The air separated from the water in W escaped through the pores in the form of very fine bubbles. If the porous material became clogged, the water level in W would rise and more water would exit to the nozzle S. This arrangement produced a very effective distribution of air through the water, thus increasing the amount of oxygen absorbed by the water in the aquarium. It is the first mention in a patent of the use of a porous medium in an air release, making it the forerunner of our familiar air stone.

Wohlfahrt described his aeration system (Figure 44-976242) as follows: "This invention relates to a new and useful improvement in aquariums, the objects of my invention being to provide a construction in which the water tank may be cleansed without removing the fish from the aquarium; in which the water ay be automatically and intermittently drawn off from the bottom of the tank, the volume of the water in the tank being reduced to any desired or predetermined depth, the tank also adapted to be in communication with a continuous stream of fresh water, whereby a circulation of water in and through the tank is maintained and the water kept in a health state or condition beneficial to the fish in the aquarium; and in which the water in the tank is aerated; and to improve generally upon constructions of the kind described." Fig. 3 in the drawing shows a detail of the siphon mechanism that automatically and intermittently drew water off from the bottom of the tank, and Fig. 5 is an enlarged view of the injector that mixed air and water, thus aerating the water that entered the tank. Obviously such designs were not really practical for the average aquarist, being more suitable for public aquaria.

The last aeration patent in this set was awarded in 1913 to Henry A. Rogers of Pagosa Junction, Colorado, a refinement of his 1908 patent. In this improvement (Figure 45-1055082) he enlarged the filter (which held "…sand or another filtering medium…") and attached it to the side of the tank.

The remaining constructs in this decade were mainly design patents for globes, bowls, and other aquaria. The first patents for a flat-sided fish bowl went to George R. West of Pittsburg with two 1916 designs (Figure 46-D49292 and Figure 47-D49480), the latter similar to the former except that it had a plug in fish bowl opening that accommodated a vase to hold plants. More conventional globe designs were represented by those of Kraft Booth of Philadelphia in 1909 (Figure 48-925861), Herrman Simons of Cincinnati in 1917 (Figure 49-D51433), and Jesse L. Turner of Morgantown, West Virginia in 1918 (Figure 50-D51663).

An elaborate fountain aquarium design was patented in 1909 by Rudolf Glaser of New York City (Figure 51-919157). Glaser's fountain was surrounded by two stepped circular aquaria complete with plants and illuminated by electric lights both in the center and overhead. An aquarium with a very ornamental frame was designed in 1912 by Francis A. Ronne-

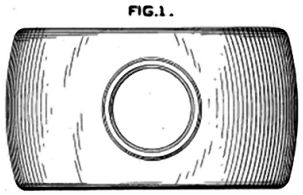
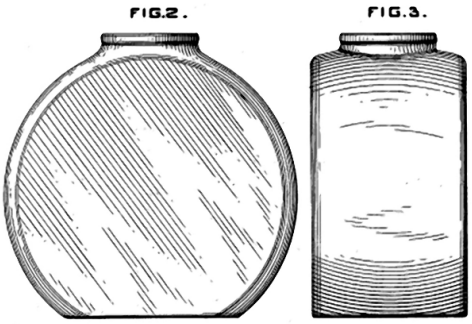


Figure 46-D49292. 1916: George R. West's flat-sided fish bowl.



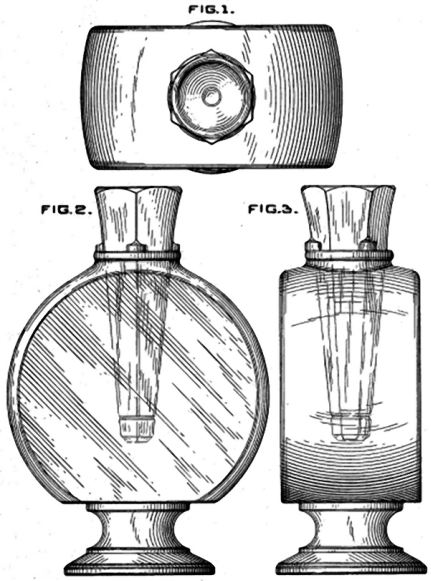


Figure 47-D49480. 1916: George R. West's plug in a flat-sided fish bowl.

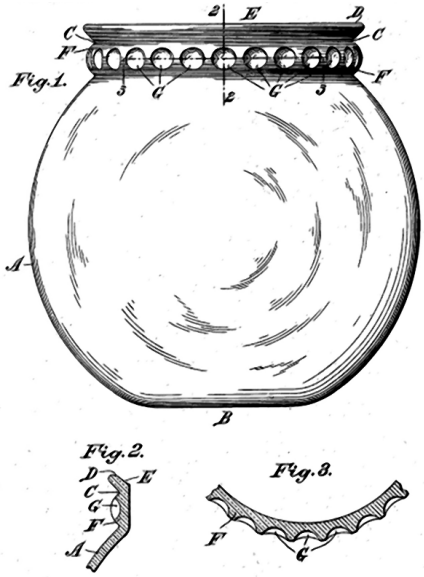


Figure 48-925861. 1909: Kraft Booth's fish globe design.

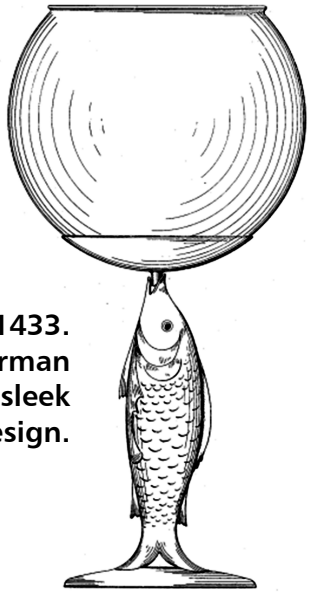


Figure 49-D51433. 1917: Herrman Simons's sleek design.

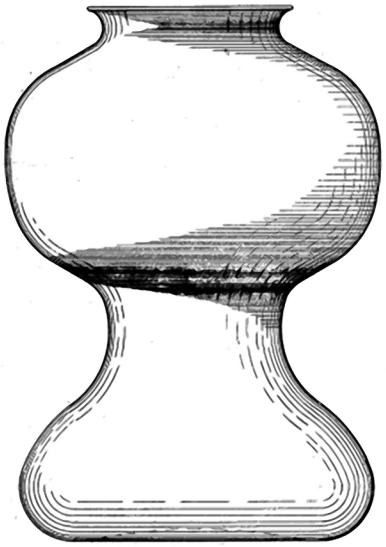


Figure 50-D51663. 1918: Jesse L. Turner's fish globe and stand design.

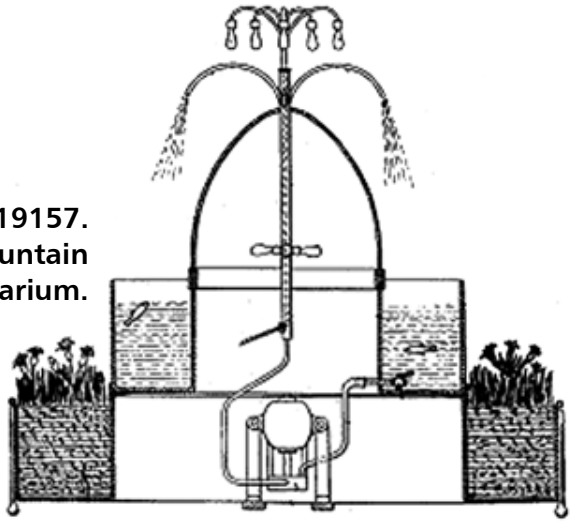


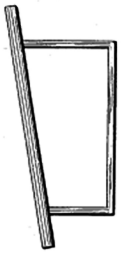
Figure 51-919157. Rudolf Glaser's fountain aquarium.

burg of Chicago (Figure 52-D43062), and a very modern looking one in 1915 by John Halterbeck of New York City (Figure 53- D48108). A simple, sloping wall aquarium design by Samuel Jacob of Philadelphia appeared in 1911 (Figure 54-D41977).

Several novel aquariums also surfaced during this period, notably the trough-like design by Edgar C. Ely of Carbondale, Pennsylvania in 1915 (Figure 55-1127976) that limited the number of joints that needed water-proofing to just the two ends of the tank. Another was the odd design by Joseph Nowicki of Detroit in 1916 shown in Figure 56-D48946. For a simple globe aquarium, this one had more embellishments than a Christmas gingerbread house!

In 1916 Jacob Williamson of Chicago devised an aquarium in which the gravel and plants could be removed and cleaned without removing the water or the fish (Figure 57-1169449). He also provided a way to supply fresh water to the aquarium slowly, so as to maintain the level of the water in the tank without changing the temperature suddenly and endangering the health of the fish. The diagram shows a cylindrical aquarium with a tray in the bottom attached to a rod. The end of the rod has a small circular plate to which was attached a cylindrical woven wire cage. At the top of the wire cage a glass bottle was attached, open at the top and closed at the bottom by a cork attached a wooden peg, the lower portion of the peg having a small groove that permitted water to slowly enter the aquarium. The rate the water was released could be controlled by rotating the peg. The cage was filled with gravel into which

Figure 52-D43062. 1912: Francis A. Ronneburg's framed aquarium.



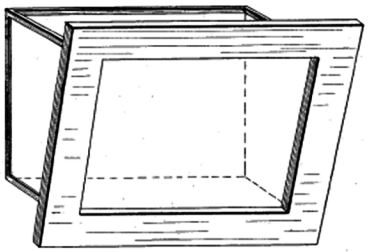


Figure 54-D41977. 1911: Samuel Jacob's wall aquarium.

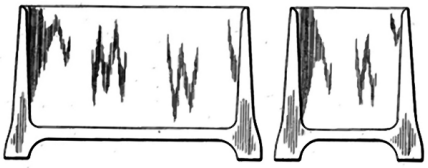
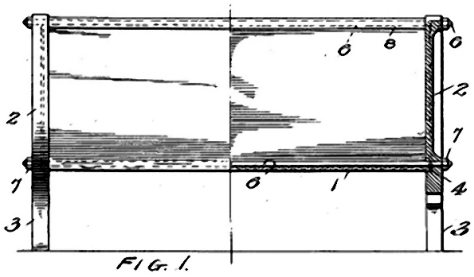


Figure 53-D48108. 1915: John Halterbeck's modern design.



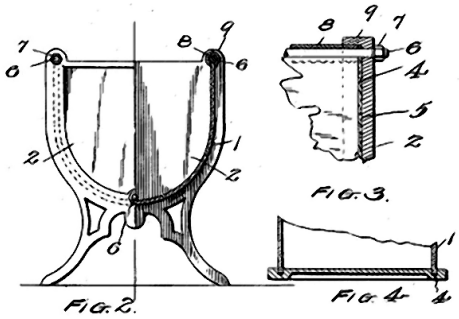


Figure 55-1127976. 1915: Edgar C. Ely's trough design.

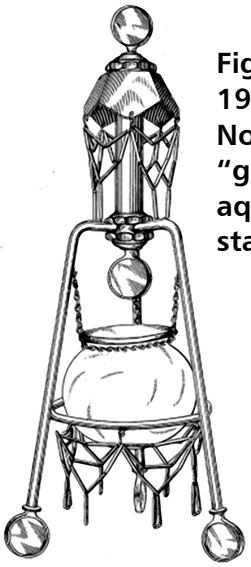


Figure 56-D48946. 1916: Joseph Nowick's "gingerbread" aquarium and stand.

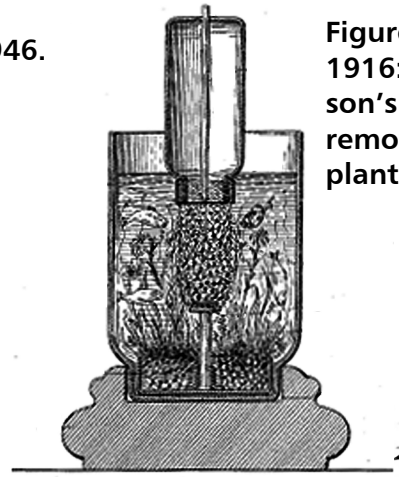


Figure 57-1169449. 1916: Jacob Williamson's design with removable gravel and plant holders.

Figure 59-1322322. 1919: William Mack's aquarium construction patent.

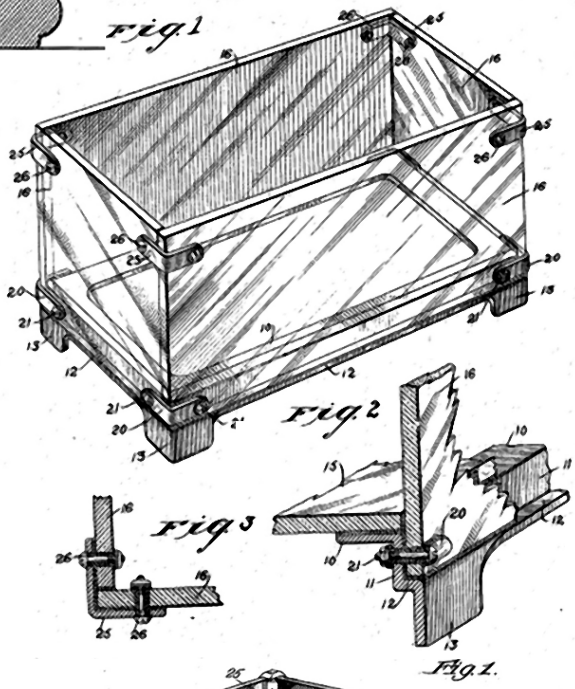
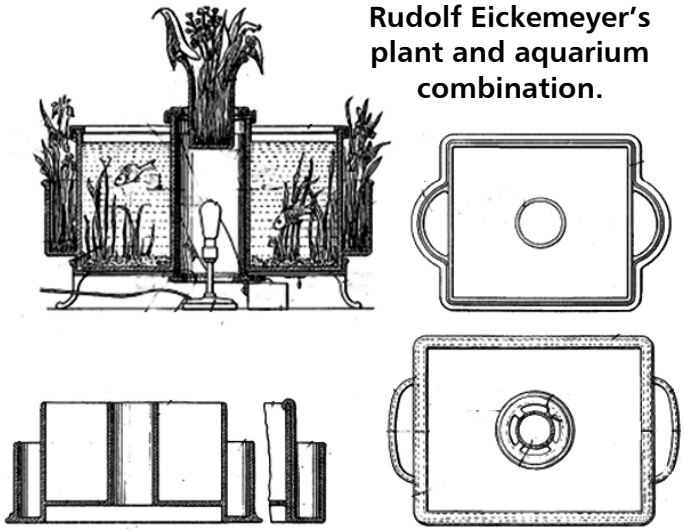


Figure 58-1263391. 1918: Rudolf Eickemeyer's plant and aquarium combination.



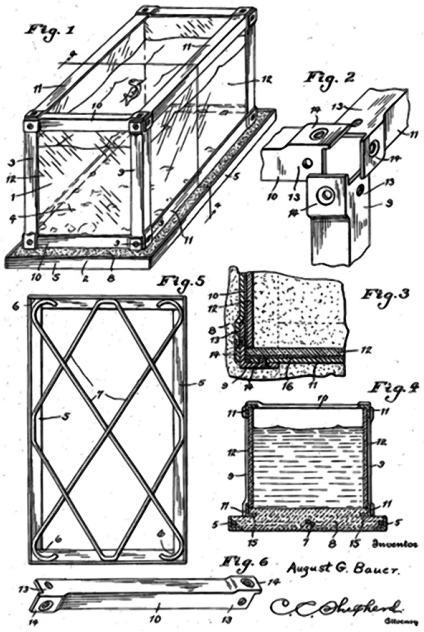


Figure 60-1432827. 1922: August G. Bauer's aquarium construction patent.

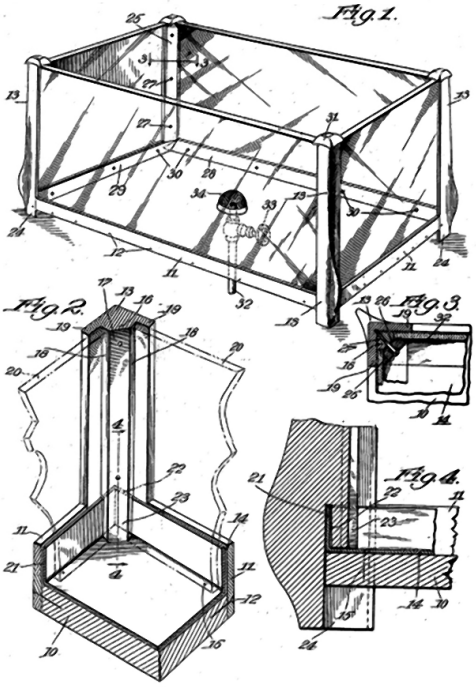


Figure 61-157196. 1926: Wladyslaw Galant's aquarium construction with a water entry in the bottom.

aquatic plants could be planted and, at intervals, the tray with the bottle could be lifted out of the aquarium without disturbing either the fish or the plants.

A more complex and ingenious plant-aquarium combination was patented by Rudolf Eickemeyer, of Yonkers, New York in 1918 (Figure 58-1263391). There were plant holders on the two short sides of the aquarium and one in the middle (the aquarium had a cylindrical hole for this purpose). One innovation was the light bulb below the center plant holder that was surrounded by a transparent cylindrical screen that rotated via a clockwork mechanism. The screen, which could be changed, was constructed of various colors that imparted a forever changing, colored light show within the aquarium.

PROHIBITION: THE DECADE OF 1919-1928

This decade was also a time for many design patents. We'll begin with the more utilitarian ones, starting with the frameless aquarium construction patent in 1919 by William Mack of New York City (Figure 59-1322322). This was the first design to use waterproof cement to seal the glass joints, although strength was achieved by using L-shaped metal brackets fastened with bolts through holes drilled through the glass. There was no doubt that this was a strong aquarium, but the nature of the "waterproof" cement was not specified so it is not known how long a tank would remain leak-free with the available cements of the day.

The 1922 patent of August G. Bauer of Columbus, Ohio (Figure 60-1432827) showed a framed aquarium that somewhat resembled those familiar to aquarists of the 1950's and 60's, although the angle-iron frame was bolted together, not spot-welded. The base was made of reinforced concrete, a definite hazard to those prone to hernias, but admittedly as strong as it gets ☺!

Wladyslaw Galant of Chicago (Figure 61-1571196) designed an aquarium in 1926 that had an all-metal frame. However, like many older aquariums, a top frame was absent so the glass edges at the top had to be polished for safety. As in the first American aquarium patent, to minimize leakage there were external L-shaped flanges and flat internal ones fastened together with lugs attached to the outer flanges. The base was made of wood, but it was glazed and covered with glass so the wood never came into contact with water. A pipe for water entry was located in the bottom of the tank.

An aeration patent was obtained in 1926 by Evert W. Beth of The Hague, Netherlands (this was an American patent). Two versions are shown in the drawing (Figure 62-1574783), with Beth preferring the second one, although the underlying principle was the same. Beth claimed that it would remove carbon dioxide and add oxygen to the water, which it did, but it also had the advantage of circulating the water

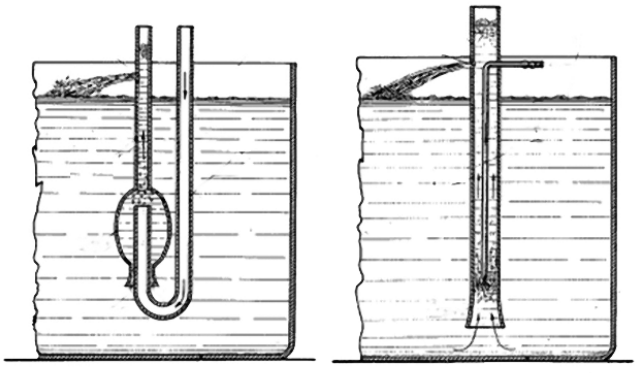


Figure 62-1574783. 1926: Evert W. Beth's aerator.

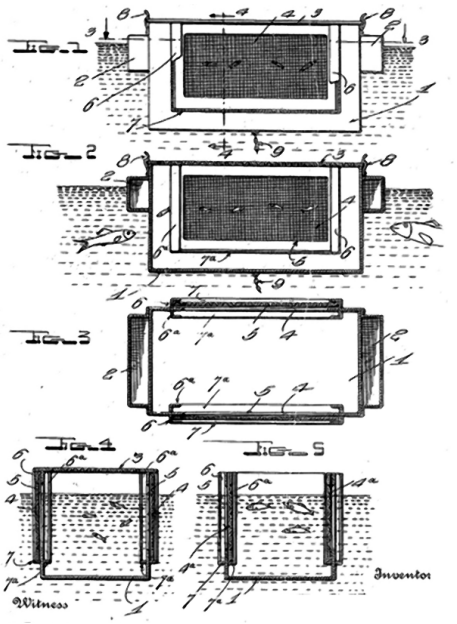


Figure 63-1444367. 1923: Brolliar B. Collamer's Breeding cage.

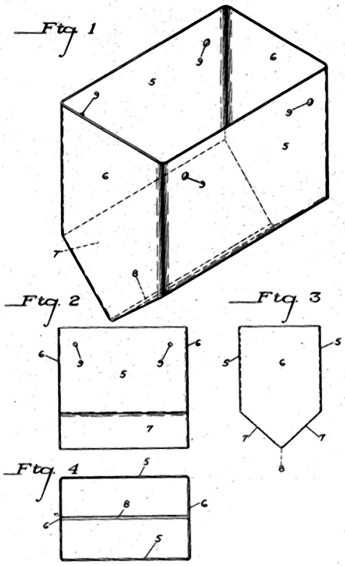
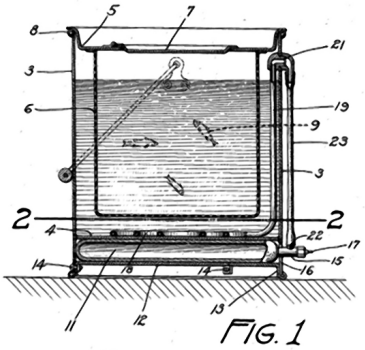


Figure 64-1552063. 1925: Paul O. Kuehn's breeding trap.



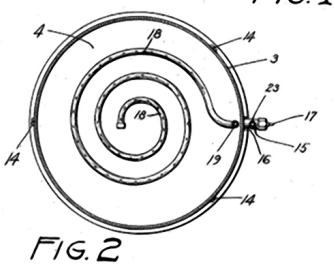


Figure 65-1616125. 1927: Frank L. Holman's shipping can.

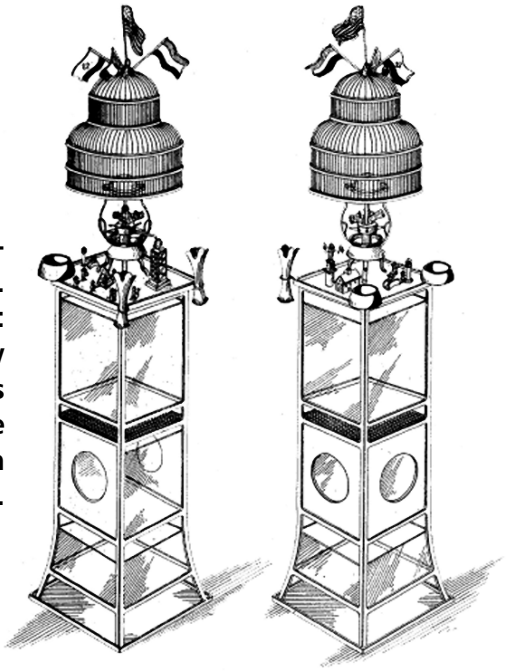


Figure 66-D53157. 1919: Andrew Syrocki's birdcage aquarium combination.

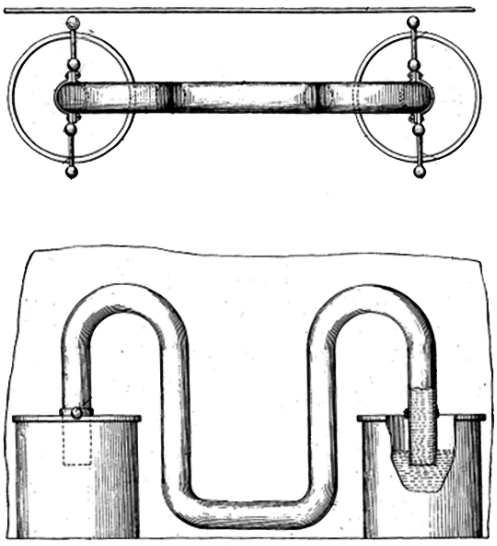


Figure 67-1576462. 1926: Herman A. Polzin's fish bridge.

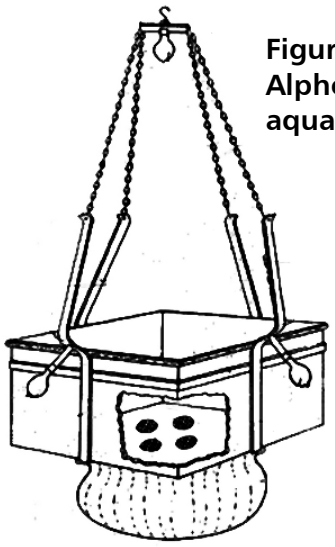


Figure 68-1641496. 1927: Alphons M. Kuhl's hanging aquarium and flower box.

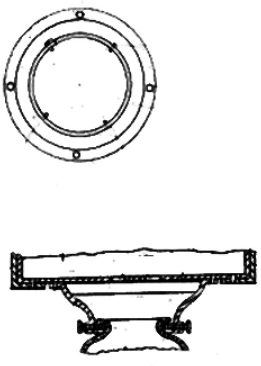
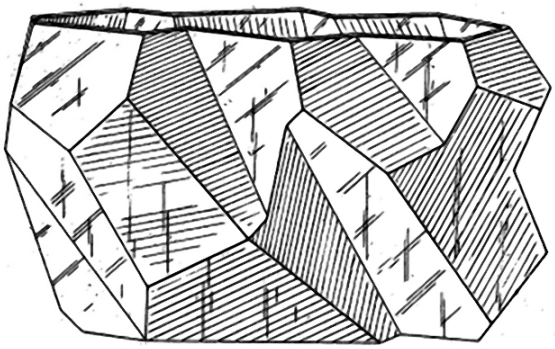


Figure 69-D77018. 1928: Thomas W. McCreary's many-faceted fish bowl.



since it drew the tank water from the bottom. These were simple but effective devices, but since they were made mainly of glass they were fragile.

Two breeding cages were patented during this decade, the first in 1923 by Brolliar B. Collamer of Fort Collins, Colorado (Figure 63-1444367). However, it was more of a cage to protect young fish than a traditional livebearer breeding cage. The cage had floats on both of the small ends, and the screens could be replaced with others of different mesh sizes to suit the fish the device was protecting. In 1925, a more familiar "Live bearing fish breeding device" was patented by Paul O. Kuehn of Pittsburg (Figure 64-1552063). The bottom sloping sides had a narrow slit from which the new-born livebearer fry could escape. This was a very practical device and was actually on the market for many years, including post-World War II.

The next shipping container design appeared in 1927, that by Frank L. Holman of Minneapolis, Minnesota (Figure 65-1616125). In this variation on a well-known theme, the air or oxygen bottle was positioned below the can. An internal spiral ring with many holes distributed the gas evenly throughout the can. Unlike Remsburg's 1907 design, Holman did specify that the cover was perforated so that the excess gas could escape.

The bird cage aquarium had not died out just yet, as shown by the patent obtained by Andrew Syrocki of Detroit, Michigan in 1919 (Figure 66-D53157). This consisted of a bird cage at the top situated over a lamp, followed by a tray where holders could be placed in the corners, then the aquarium itself, followed by an open shelf with circular cutouts in three of the four sides. To top it all off, the drawing shows three flags stuck into the top of the bird cage. The only thing Syrocki left out was a phonograph playing the Star Spangled Banner ☺! Since this was a design patent, there is no description so we do not know how the tank was accessed, but I imagine that the shelf containing the lamp and birdcage could be lifted off for this purpose. This is one of the problems often encountered with design patents, i.e., the reader is forced to guess how things were supposed to work.

The year 1926 saw the second patent issued for a fish bridge (earlier, one was incorporated into Palen and Sexton's bird cage aquarium of 1878). This was issued to Herman A. Polzin of Chicago and was a much simpler design (Figure 67-1576462) since all one had to do was to fill the bridge with water, cap the ends temporarily and then insert both ends into the two tanks and remove the caps. Polzin stated that it "…can be used for ornamental or advertising purposes in connection with aquariums." The inventor evidently actually built the bridge since he explained that he cleaned the tube by filling a cloth bag with ground lead and sliding it back and forth in the tube. He also described his fish chasing each other back and forth through the bridge, so I assume that it was made of glass, although Polzin did not specifically identify the material.

A hanging aquarium that combined both a fish bowl and a flower box was patented by Alphons M. Kuhl of Omaha, Nebraska in 1927 (Figure 68-D53157). In overall appearance it was a hanging flower box with a fish bowl added as an afterthought. The bowl was attached to the flower box with setscrews, much in the manner that a light bulb shade is fastened today. This was really a disastrous design since the bottom of the flower box had screened apertures so that the surplus water from the flower box passed directly into the aquarium, adding all sorts of unwanted – and perhaps toxic – material to the fish bowl. Furthermore, access to the aquarium was impossible unless one removed the set screws that held it to the flower box. Removing a light bulb shade that uses set screws without breaking anything is iffy; removing a fish bowl full of water and fish is a real challenge ☺!

Designs for fish bowls were common in this decade. However, the fish bowl patented in 1928 by Thomas W. McCreary of Monaca, Pennsylvania (Figure 69-D76252) had more facets to it than an engagement ring, and one is a bit skeptical whether the fish could actually be seen in such a bowl. There were two designs for flat-sided aquariums in this decade, the first by Leslie H. Burlin of Chicago in 1927 (Figure 70-1620006). Burlin's design was shaped like a World War I army water canister, round in shape but flattened with an opening at the top for access to the

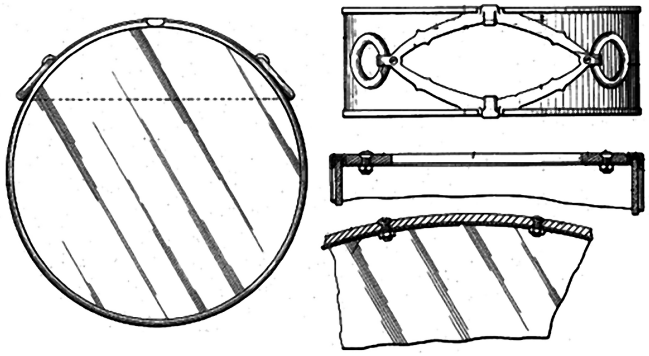


Figure 70-1629996. 1927: Leslie H. Burlin's cannister-style aquarium.

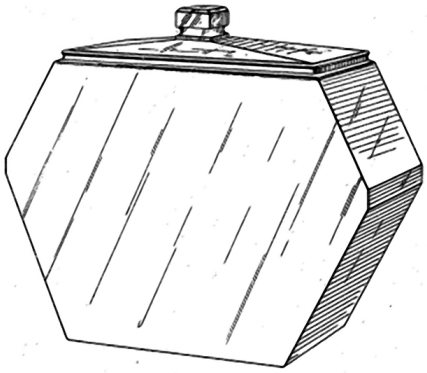


Figure 71-D77018. 1928: Thomas W. McCreary's flat-sided fish bowl.

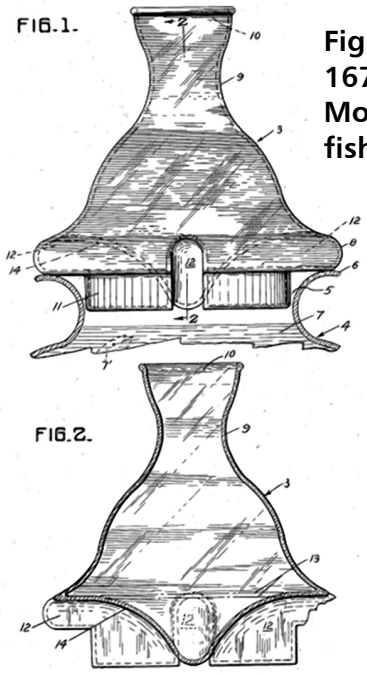


Figure 72-1674046. 1928: Motogo Jyumi's-fish bowl closure.

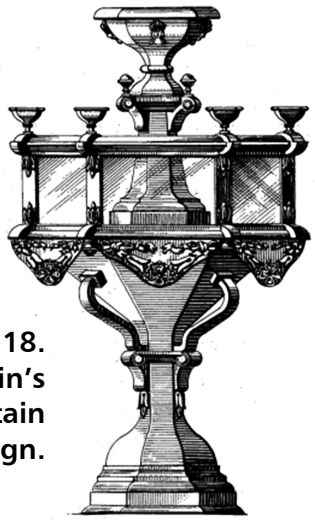


Figure 73-D53718. 1919: Morris Stein's first fountain aquarium design.

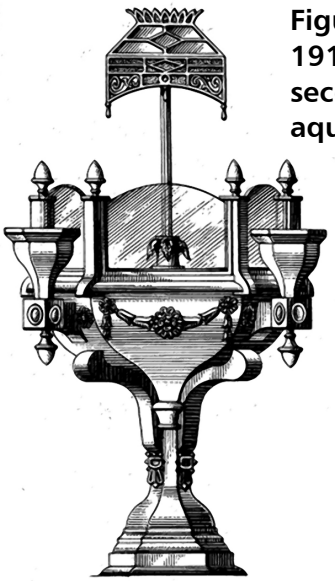


Figure 74-D53719, 1919: Morris Stein's second fountain aquarium design.

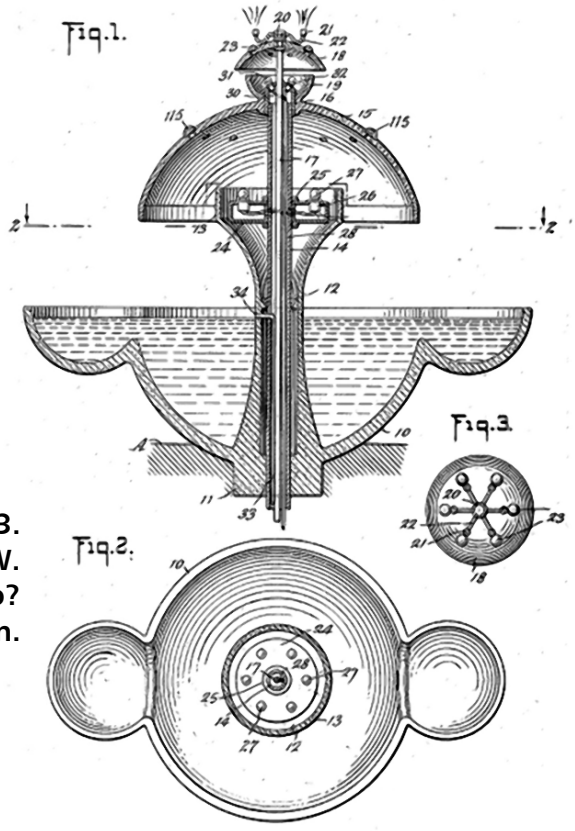


Figure 75-1649683. 1926: Charles W. Goodsman's comp? lex fountain design.

fish. It was provided with rings for "…convenient handling…" but since these could not be used for hanging it on a wall, one envisages it rolling along the table and falling off onto the floor ☺! A more reasonable design is the attractive flat-side fish bowl by McCreary, patented a little later in 1928 than his multi-faceted bowl (Figure 71-D77018).

Motogo Jyumi of Oakland, California patented the first closure for a fish bowl (Figure 72-1674046), claiming three advantages for the device: (1) It kept cats from scooping out the fish, (2) it provided channels open to the atmosphere and to the fish bowl for free circulation of air to the latter, and (3) well, we'll quote Jyumi himself on this point: "The plainness of the wide-mouthed fishbowl in common use is quite marked and in many instances is not in artistic harmony with the surrounding works of art, and, therefore because of this omission of artistic effect they are not in full favor with persons possessing a high degree of esthetic taste." After reading this I realized that my fish bowl is decidedly out of tune with the Renoir hanging on the wall next to it ☺!

Morris Stein of Philadelphia created two fountain aquarium designs in 1919 (Figure 73-D53718 and Figure 74-D53719) that differed only in the fountain head itself. The 1926 design of Charles W. Goodsman of Linnton, Oregon departed from this traditional fountain design and reflected the Art Deco period that started in 1900 and ended in 1930 (Figure 75-1649683). The basin consisted of three bowls, a large fish bowl and two smaller bowls. In the center column there was an inlet pipe for incoming water and an outlet pipe for overflow water. Above this was an inverted bowl almost the size of the fish bowl, and this was capped off with a smaller inverted bowl. Water was sprayed from nozzles on top of the smaller inverted bowl, the water flowing over the two inverted bowls into the fish bowl. Six lamps (27) were located in the bottom of the large inverted bowl and shined their light onto the surface of the water in the main bowl. There were six bull's eyes (115) embedded in the large inverted dome, so light shined out from these locations as well. This must have quite a spectacular fountain, to say the least ☺!

Aquarium stand designs also proliferated during this decade. The first three - one short stand and two long ones - were patented in 1920 by Frank S. Crowell of Toledo, Ohio and were constructed of ornamental iron (Figure 76-D55751, Figure 77-D55753 and Figure 78-D55754). A combination patent of jardinière, aquarium, and birdcage was assigned to John B. Hue of Tarentum, Pennsylvania in 1925 (Figure 79-D64852). In 1928, Bernard Tauman of Chicago pat-

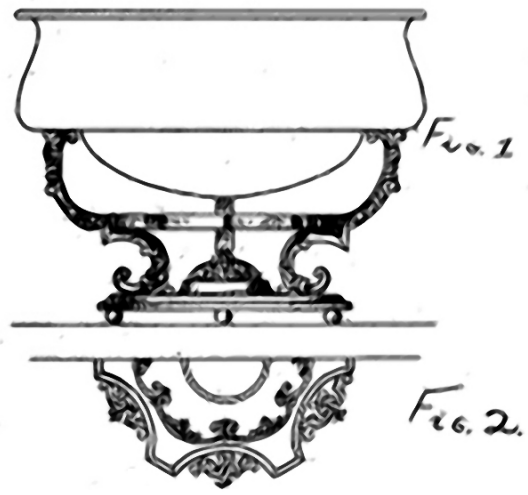


Figure 76-D55751. 1920: Frank S. Crowell's low stand fish bowl design.

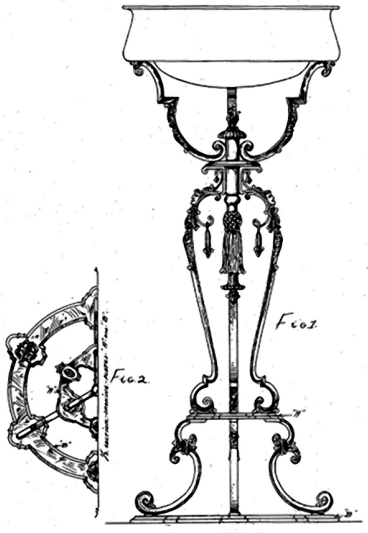


Figure 77-D55753. 1920: Frank S. Crowell's first high stand fish bowl design.

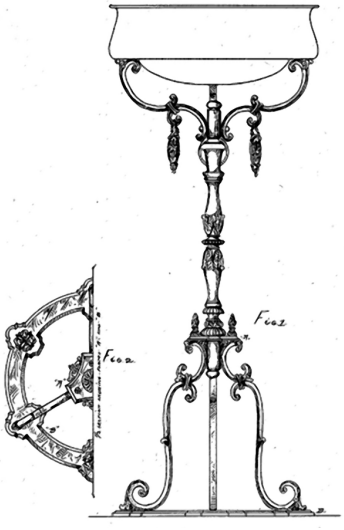


Figure 78-D55754. 1920: Frank S. Crowell's second high stand fish bowl design.

Figure 79-D64852. 1924: John B. Hue's combination of jardinière, aquarium, and birdcage.

Figure 80-D74902. 1928: Bernard Tauman's stand for a circular globe.

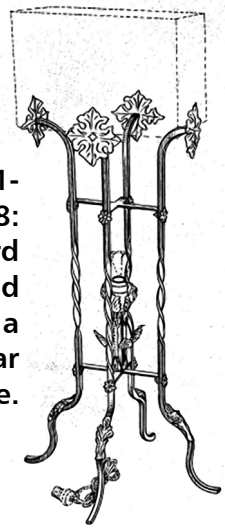


Figure 81-D75081. 1928: Bernard Tauman's stand for a rectangular globe.

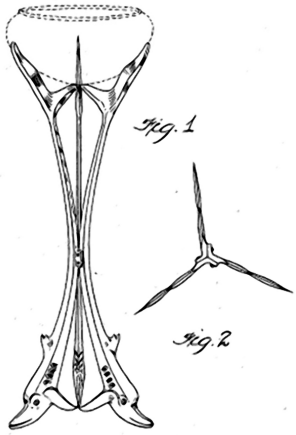


Figure 82-D76204. 1928: Richard Rychtarik's modern design.

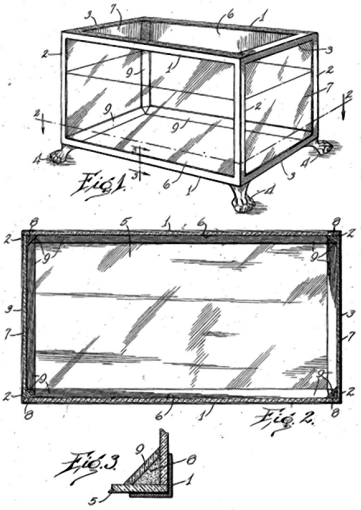


Figure 83-1481435. 1924: William Rossberger's footed, rectangular design.

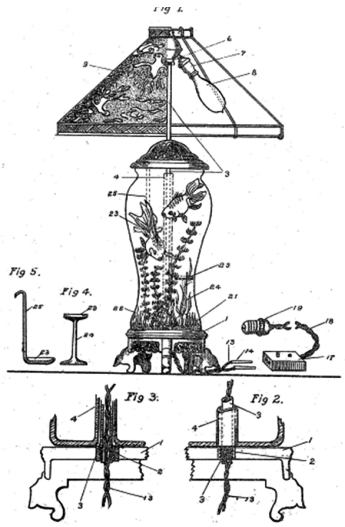


Figure 84-1297254. 1919: Natsuo Sato's lamp aquarium.

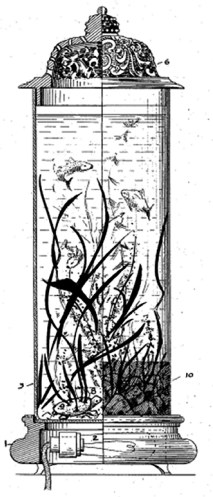


Figure 85-1333454. 1920: Natsuo Sato's secondlamp aquarium.

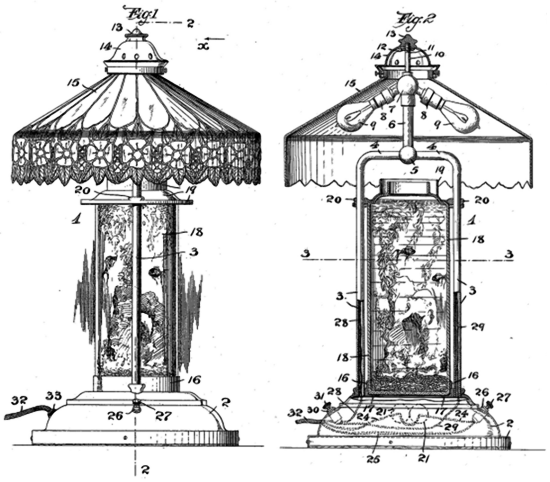


Figure 86-1449772. 1923: Frederick L. Miller's lamp aquarium.

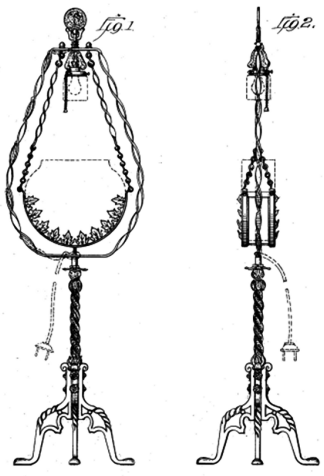


Figure 87-D78595. 1928: Bernard Tauman's lamp stand aquarium.

ented two very interesting stands designed to hold flat-sided aquaria (Figure 80-D74902 and Figure 81-D75081). A sleeker design by today's standards was that in 1928 by Richard Rychtarik of Cleveland (Figure 82-D76204). The problem with many of these aquarium stands, Tauman's in particular, was that in practice they would be top-heavy and very prone to being tipped over, causing a deluge of monumental proportions depending upon the size of the aquarium they supported.

William Rossberger of Wilmette, Illinois patented a rectangular aquarium design in 1924 with ornate feet, a feature that had been common during the previous decade (Figure 83-1481435). It was constructed of angle iron, painted or galvanized to protect it from rusting (galvanization, however, was a bad idea because of the toxicity of zinc to the fish should water came into contact with the metal). This was an all-welded design, an improvement over prior designs that utilized screws, rivets, or bolts, because the cement was set flat against the frame, minimizing leakage and rusting.

This decade ushered in a new type of aquarium design – a combination of a decorative lamp and an aquarium in which one of the aims was to illuminate the fish. The first to arrive on the scene was created by Natsuo Sato of San Francisco in 1919. The cleverness of the design should not be overlooked (Figure 84-1297254). Not only was it aesthetically pleasing, but it was designed so that the shade portion, base, the electrical wires, and the conduit that ran through the center of the aquarium could be disconnected and removed, leaving just the aquarium. Sato assumed that if the aquarium was planted, the plant growth at the bottom would hinder the fish in search of food so he included a glass food platform hung from the top of the aquarium. Access to the aquarium was provided by the cover at the top that could be raised around the electrical conduit when required. Sato followed up this design in 1920 with one that comprised a cylindrical design that did not have a lamp shade, the illumination being provided by one or more lamps in the base (Figure 85-1297254). Since the bottom of the cylinder was clear and because Sato specified that the bottom of the cylinder was not to be covered by sand or gravel, the light shone up onto the fish and the plants. The plants in this tank were anchored to weighted objects, e.g., "… which may be in the form of small imitation turtles, rocks or other objects…"

The next lamp aquarium on the scene was patented by Frederick L. Miller of Newark, New Jersey (Figure 86-1449772) in 1923. This design also incorporated lights in the base so that light could be directed upwards into the glass aquarium. The top of the aquarium was open but even so, access must have been awkward. In 1928 a sort of minimalist aquarium lamp patent was awarded to Bernard Tauman of Chicago (Figure 87-D78595). Only a very small shade surrounded the lamp, so this rather easily tipped over design did afford easy access to the fish for cleaning and feeding. The problem with all of these lamp aquarium ideas is clearly the close proximity of electrical wires to water, exacerbated by the fact that at the time neither electrical wires nor their contacts were particularly safe.

The last lamp aquarium of the decade had a really strange look to it. In 1927, Herbert A. Stone of Chicago was awarded a patent for a design that attempted to conceal the frame and provide a rustic appearance (Figure 88-1643527). Stone covered the frame (and even the lamp housing) with a "cementitious substance (sic)" to achieve the effect. Stone does not state how the frame was put together, but no rivets or bolts were shown in the diagram. To conceal the aquarium frame that is usually ignored anyway, this was clearly overkill.

The 1927 aquarium design of John A. Schrimp of Los Angeles was particularly interesting in that it had a removable section that had miniature hills, valleys, and mountains constructed of a ceramic that could be removed from the aquarium for cleaning (Figure 89-1634305). Since this structure had its own floor, the tank was double-bottomed. Small holes were drilled into this structure so that sediment could pass through to the space between the double-bottom. The dirty water then could be drained via a valve located underneath the tank (26 in the figure). The frame of the tank was made of metal and con-

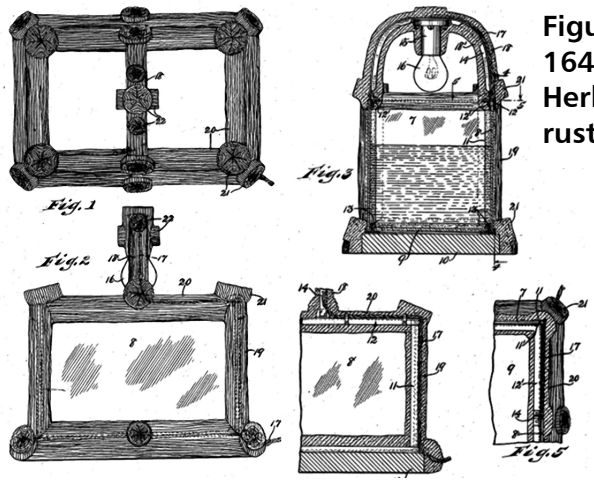


Figure 88-1643527. 1927: Herbert A. Stone's rustic aquarium.

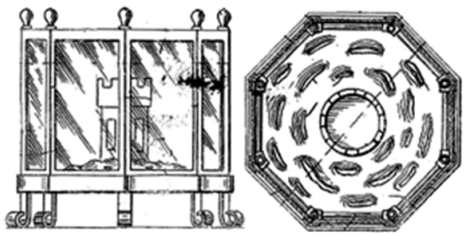
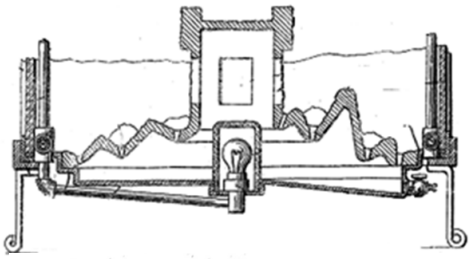


Figure 89-1634305. 1927: John A. Schrimp's octagonal design.



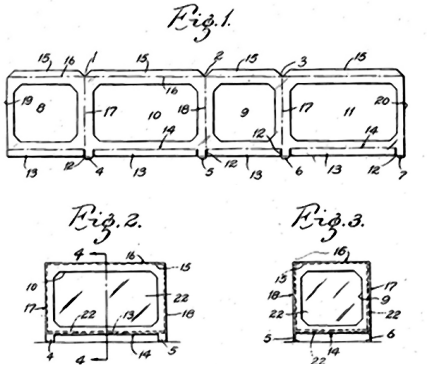


Figure 90-1852597. 1932: Fay E. Taylor and James M. Conway's aquarium punched from a single metal sheet.

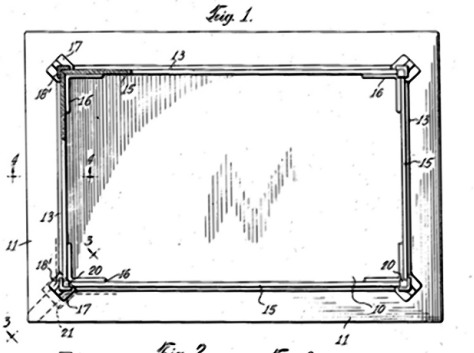


Figure 91-2081023. 1937: Lewis Teach's aquarium construction patent.

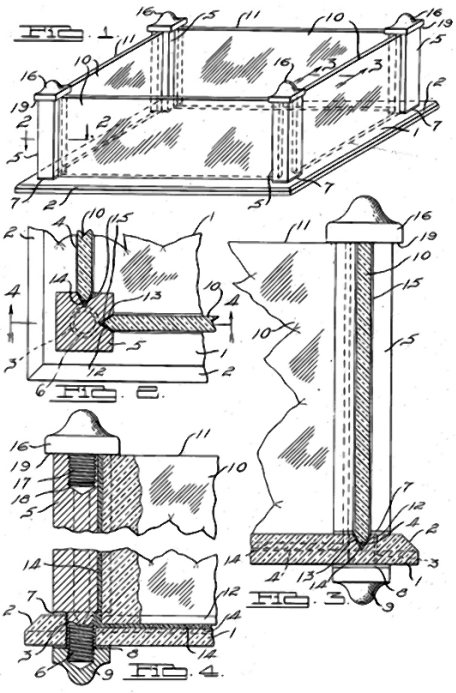


Figure 92-1986018. 1933: Alfred C. Schoepfer's V-groove, beveled glass construction.

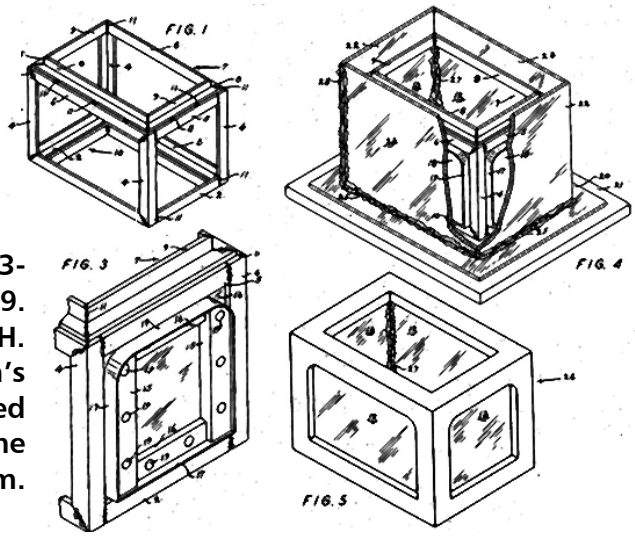


Figure 93-2016439. 1935. Clark H. Hogan's concealed frame aquarium.

nected to the metal bottom. This is an octagonal aquarium, and at the top of each of its eight corners was a light bulb; a ninth light bulb was located within the center of the tank within a glass container (24). When the switch was thrown, Schrimp's aquarium must have looked like a Christmas tree ☺! Like the lamp aquariums, however, there was always a danger of electric shock should the water leak into the large lamp container or the conduits containing the wires that led to the eight topmost lights.

THE GREAT DEPRESSION: THE DECADE OF 1929-1938

In 1932 Fay E. Taylor and James M. Conway of St. Louis, Missouri obtained a patent for the construction of an aquarium from a single sheet of metal (Figure 90-1852597). Rectangles were cut out as shown in the diagram and the resulting sheet was folded to produce the finished frame, the last seam being welded together. Adding glass sides and a glass bottom completed the aquarium. Tabs were left at the top of the frame and folded over, thus insuring that the aquarist could not cut his hands on any sharp metal edges. This was a well-thought out idea but there was a lot of waste in the cut out rectangles. Another aquarium construction design was patented by Lewis Teach of Brooklyn in 1937 and used L-shaped exterior and internal flanges, bolted to the bottom of the aquarium (Figure 91-2081023). No top frame was used in this design.

Alfred C. Schoepfer of Birmingham, Michigan patented a new type of aquarium construction in 1933 in which the corner posts contained V-grooves into which the glass was inserted (Figure 92-1986018). Aquarium cement was placed into the grooves before insertion, and the glass was beveled so that a very tight fit was obtained. When the caps (16) were screwed into the top of the posts, they pressed the glass into the groves in the base plate, again ensuring a tight seal. The corner posts extended into the base plate and, having threaded lugs on that end, were secured with threaded caps. If the base were made of glass, the entire aquarium save the posts was then made of glass, although Schoepfer suggested marble could be used. There was, however, no top frame, but as this design was shallow in height it was not really needed. Nonetheless, the work involved in beveling glass (and marble, if it was used for the base) would have made it very costly to manufacture.

Clark H. Hogan of Oklahoma City, Oklahoma patented an elaborate aquarium design in 1935 that was meant to conceal the frame so that a rough non-machined framework could be used to keep costs low (Figure 93-2016439). To do this, he constructed a frame using flexible strips (17) on each side to form a mold (Fig. 4). Then, using glass or metal plates for the outside of the mold, he poured in a liquid material capable of becoming solidified after it had set. After the forms were removed the completed aquarium looked like that shown in Fig. 5. With regard to the liquid material that solidified, Hogan referred to a patent granted to Richard C. Hollis of Shreveport, Louisiana in 1928 for an artificial stone. I won't go into the details, but it consisted of a mixture of superfine Portland cement, magnesite, alum, and silica. To this was added a concoction of water, flake magnesium chloride, and sulfuric acid. After coloring materials were added, the concoction was poured into the mold where it set up after 12 hours. Such an aquarium must have weighed a ton and was dangerous to make, considering the sulfuric acid involved. All this just to conceal an aquarium frame!

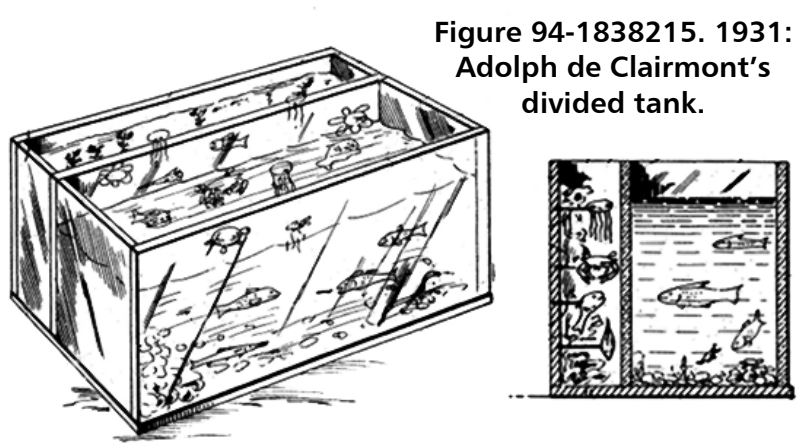


Figure 94-1838215. 1931: Adolph de Clairmont's divided tank.

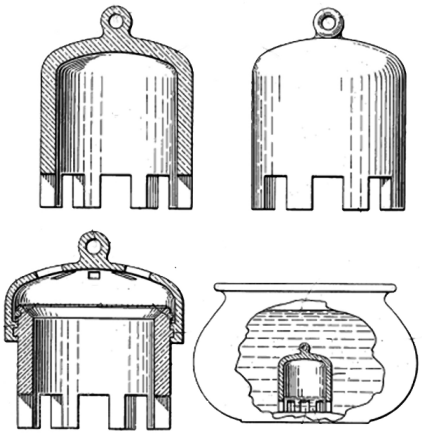


Figure 95-2008369. 1931: Harrison L. Stanley's aerator.

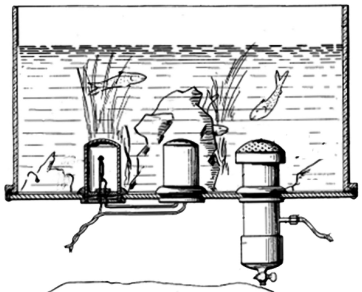


Figure 96-1939583. 1932: William Welshausen's aerator and heater.

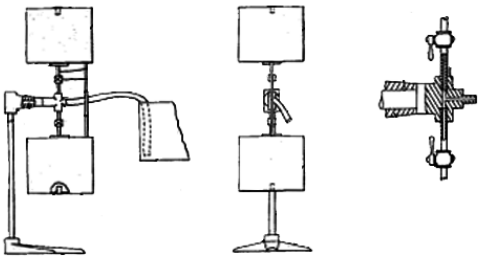
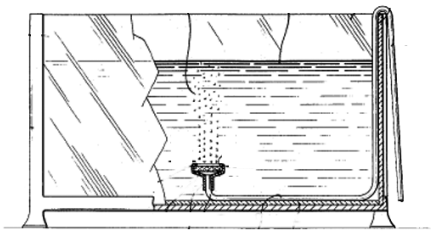


Figure 97-1945962. 1934: Michael Arneth's aeration device.



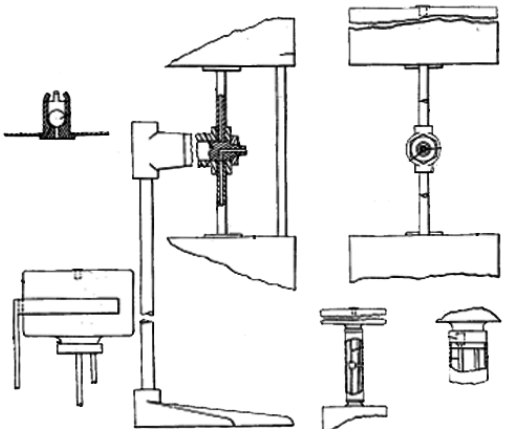


Figure 98–2008363. 1934: James B. Maris' aerator.

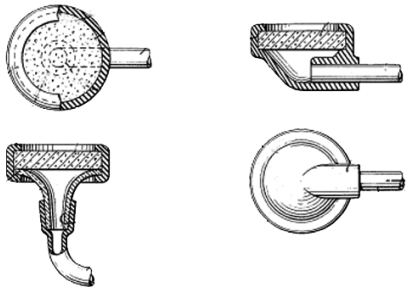


Figure 100-2028913. 1936: Paul Neumann's fountain design powered by a bicycle pump.

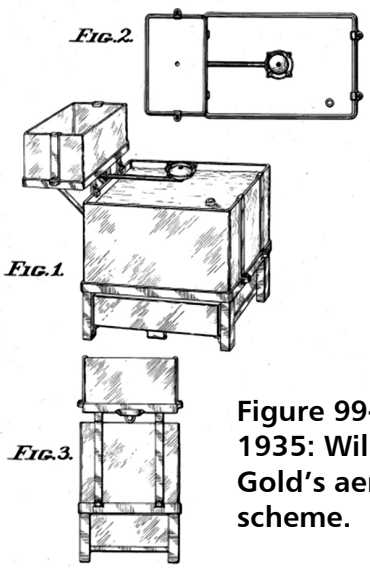
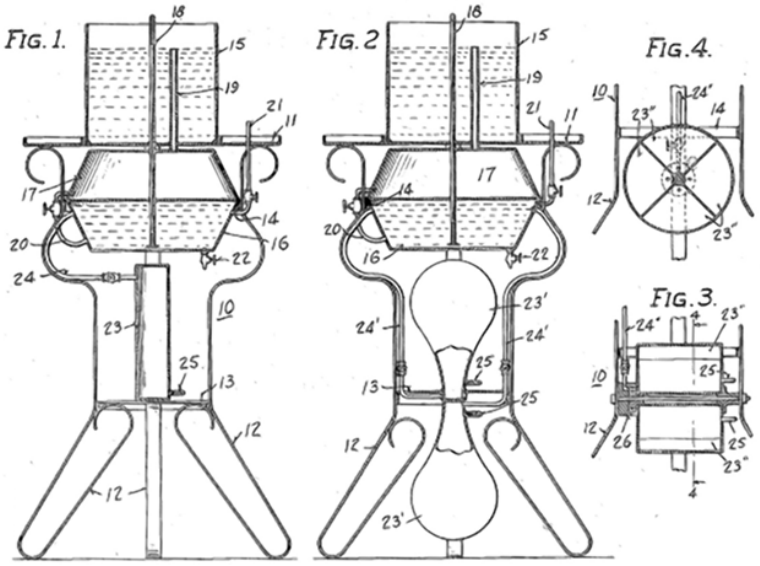


Figure 99-D96540. 1935: William P. Gold's aeration scheme.



Adolph de Clairmont patented a divided tank in 1931 that was designed to hold living as well as non-living creatures (Figure 94-1838215). This made some sense, since dead animals such as corals could be placed in the waterless rear compartment, while live fish disported in the front one. The rear compartment could also contain items or models of other objects, thus turning the tank into an exhibit for educational purposes.

Aeration was a popular subject in this decade. The first such device was a patent granted to Harrison L. Stanley of Martinsville, Tennessee in 1931 (Figure 95-2008369). Staley's claim was, "In my experimentation, I have discovered that if an open top vessel be inverted and, in this position, submerged in an aquarium so as to imprison a quantity of air within the body of the vessel and below the surface of the water, sufficient air would be dissolved by the pressure of the water against the imprisoned air to sustain fish life over a long period of time." However, considering the slight difference in water pressure between the top of the tank and the bottom, the amount of extra air that could be dissolved was almost immeasurable. Furthermore, there was little circulation to transfer the oxygenated water to the main part of the tank. In order to sink the holder on the bottom it had to be made very heavy, so in effect Stanley had produced nothing more than an interesting aquatic paperweight ☺!

In 1932 William Welshausen of Allenhurst, New Jersey patented an aquarium that had a built-in heater and aerator (Figure 96-1939583). One of the objects of his invention was to "provide a novel aerating valve having a sump that may be easily reached to empty any water leaking past the aerating valve without disturbing the aquarium." The thermostat was separate from the heater, so three holes had to be drilled into the bottom of the aquarium. Welshausen made much of the waterproof sump for the aerator but failed to mention the possibility of leakage around the heater and the thermostat, two areas just as likely to leak. As we all know, the fewer holes drilled into an aquarium below its water level, the better.

In 1934 Michael Arneth of New Britain, Connecticut reinvented the wheel – albeit a more complicated one - with his aeration device (Figure 97-1945962). Although the diagram looks complicated, it simply consisted of two containers situated one over the other on a stand located next to an aquarium. The top one was filled with water and, as the water dropped to the lower container, a venturi action produced an air current that was sent to the aquarium. After the top container was empty, the containers were simply rotated and the action restarted so there was no need to replace the water once one of the containers was filled. As the inventor stated: "With a few quarts of water for the change, the apparatus is adapted to maintain continuous operation in delivering air to the tank for a few hours."

James B. Maris of Glen Ridge New Jersey, well-known for his aquarium induction air pump, improved upon the Welshausen aerator in 1934 in that it didn't need to have a hole drilled in the bottom of the tank (Figure 98-2008363). Maris used tubing that could be bent to conform to the desired location of the air stone, and placed the air stone at the bottom of the tank to maximize oxygenation and water circulation. Prior air stone designs were simply inserted into the tank, affording limited control over their position. A variation on using the difference in water height to power a device to aerate water was patented by William P. Gold of Clifton, Kentucky in 1935 (Figure 99-D96540). The water ran out of the upper tank onto a round plate where the water sprayed upwards or just ran down into the main tank, aerating it as it flowed.

Another unusual tank was that designed by Paul Neumann of Milwaukee in 1936 (Figure 100-2028913). Below a cylindrical aquarium, Neumann positioned a two-compartment tank. Although this tank looked like two pans soldered together, they were separated, connected only by a short pipe containing a valve. Below this was an air tank, filled at intervals via a bicycle pump. The compressed air forced the water from the lower half into the aquarium where it spouted like a fountain. The overflow then drained into the upper half of the two-compartment tank. When the lower compartment

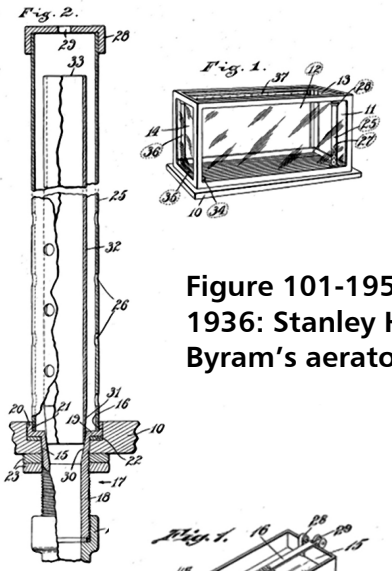


Figure 101-1956524.
1936: Stanley H.
Byram's aerator.

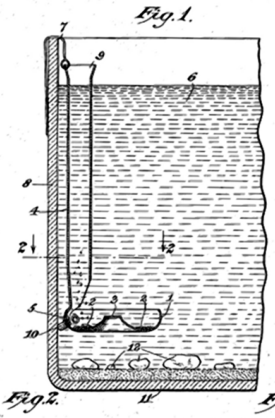


Figure 102-1976962.
1934: Herman G.
Pape's feeder.

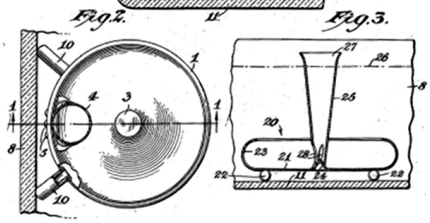
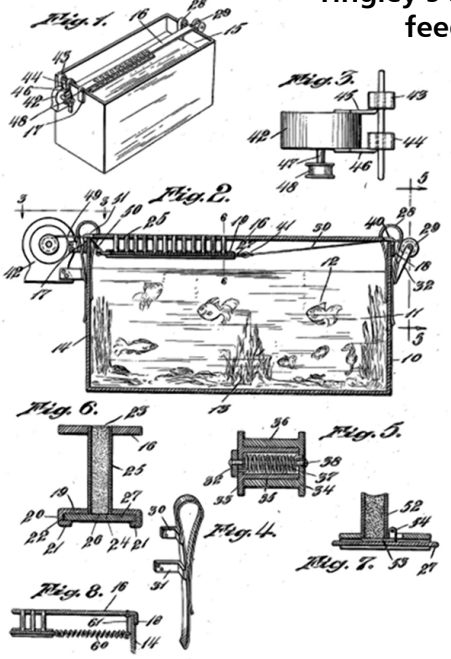


Figure 103-1989298.
1935: Leonard C.
Tingley's automatic
feeder.



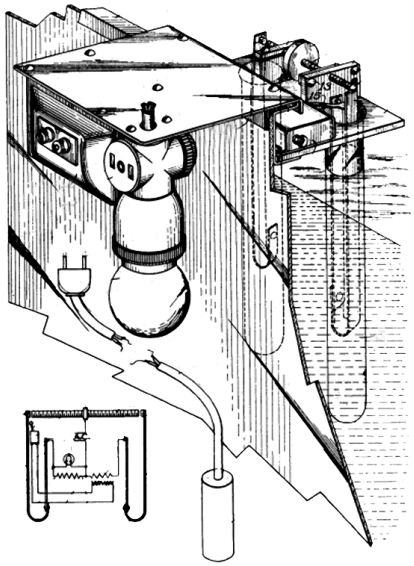


Figure 104-
1981251.
1931: George
F. Roth's
fail-proof
thermostat.

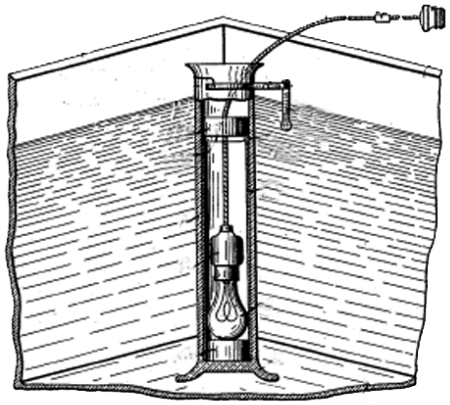
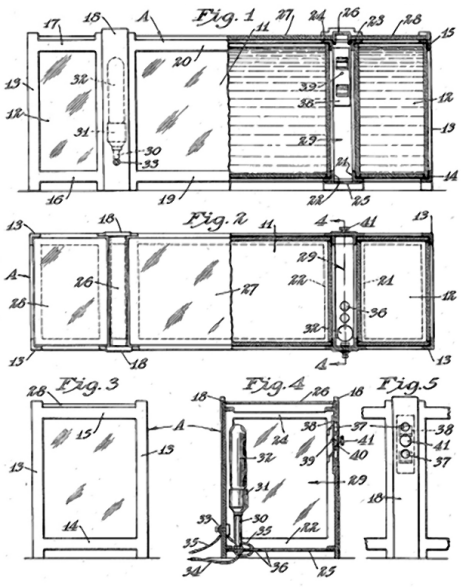


Figure 105-11803571.
1931: John J. Ulman's
light bulb heater.



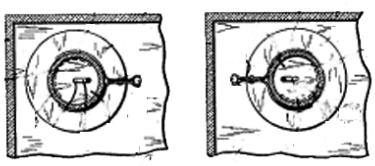


Figure 106-2016123.
1935: Wallace Schorr's
light bulb heater.

was empty, the air was shut off and the water drained into the lower compartment.

A far simpler device for aerating was that designed by Stanley H. Byram of Martinsville, Indiana in 1936 involving a water inlet and an overflow tube (Figure 101-1956524). It consisted of a spray pipe (37) and an outlet device consisting of an inner tube and an outer tube, the latter containing holes for the incoming water to escape but preventing the fish from being swept out of the tank.

Two feeding devices were patented during this decade. The first was by Herman G. Pape of New York City in 1934 and was designed to keep food from spreading throughout the tank (Figure 102-1976962). This device consisted of a tube into which the food was inserted, from which it fell down onto a feeding trough (Pape shows two variations). The assumption was that the food was (or would become when it became waterlogged in the tube) heavier than the water. This was followed in935 by a device designed for automatic feeding by Leonard C. Tingley of Providence Rhode Island (Figure 103-1989298). The invention consisted of a narrow box that spanned the length of the aquarium, containing compartments that contained the food, the bottom being closed off by a slide with a hole in it. As the slide was pulled along (it was powered by an electric or clockwork motor) and the hole arrived beneath one of the compartments, the food was released. The device could be removed easily from the tank, but the food box could only be half the length of the aquarium, since room had to be made for the slide when all the compartments were empty. Although capable of working, it definitely was a Rube Goldberg creation of the first order ☺!

George F. Roth of Chicago devised a real improvement on thermostats in 1931 (Figure 104-1981251). As aquarists well know, if the contacts on a thermostat stick together, the heat remains on and the fish are cooked. Roth's improvement was to incorporate a secondary thermostat set a few degrees higher than the primary one. The secondary thermostat operated an electro-magnetic vibrator that freed the frozen contacts of the primary thermostat. This was an extremely innovative solution to the main problem of early aquarium heater thermostats. The lamp in the drawing was used only to show when the heater was on or off.

Before thermostatic heaters were available for aquaria, light bulb heaters were common. One design in 1931 was created by John J. Ulman of Cleveland and is shown in Figure 105-1803571. The tube used was of glass so it also served to illuminate the aquarium, although this position was unsuitable for the fish and for the aquarist as well. I probably need not comment on the safety of such an arrangement, but aquarists did take chances in those days ☺! In 1935 Wallace Schorr of Morningside Minnesota devised a far safer scheme (Figure 106-2016123). In Schorr's design the lamps were not immersed in the water so the danger of electric shock was much less. The lamps, as in Ulman's design, provided both heat and light although once again, the placement of the lights was not optimal. The creation of Gilbert Wernicke and Alfred R. Lintern of Cleveland, Ohio in 1935 featured electrical heating elements concealed below the bottom of the tank (Figure 107-2002380).

Leaving nothing left to waste, including the air rushing alongside a moving automobile, Albert S. Haislip of Fredericksburg, Vermont patented a novel fish transportation device in 1935. The idea must have come to him as he watched his dog with its head stuck out of the window (Figure 108-1991149). Haislip replaced the dog with a funnel, to which was connected a hose that led to a fish can. As the automobile moved along, air would be compressed and sent to the can, thus aerating it. Score ten points for imagination for Albert Haislip ☺!

Two odd contraptions finish off this section of utilitarian patents. The first was awarded to Elmer E. Schlotz of Denver, Colorado in 1930 (Figure 109-1764356). This was an illusion apparatus designed to entertain an audience in a theater by making it appear that the performers move and act in a body of water. The diagram is fairly self-explanatory, the tank being placed between the audience and the actors or musicians. The inventor apparently knew nothing about the weight of water, however, since he blithely talked about the tank easily being installed on stage and taken up when the performance was over. Fur-

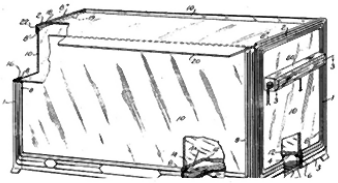
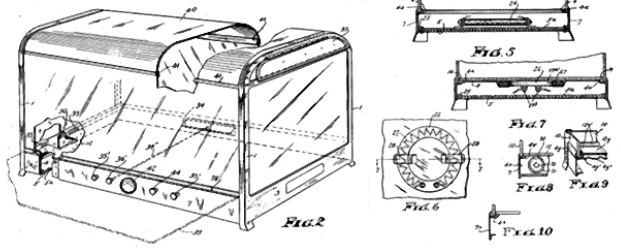


Figure 107-2002380. 1935: Gilbert Wernicke and Alfred R. Lintern's heated aquaria.



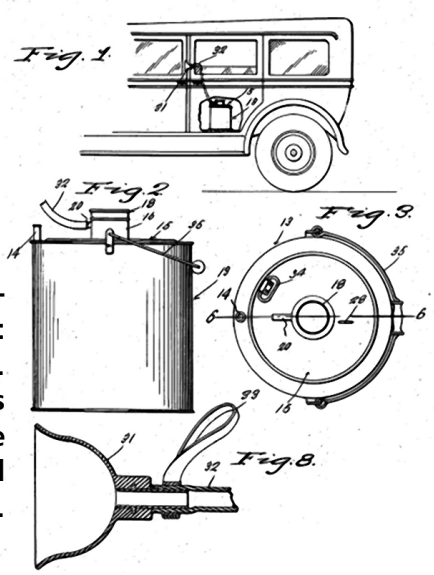


Figure 108-1991149. 1935: Albert S. Haislip's automobile aerated transporter.

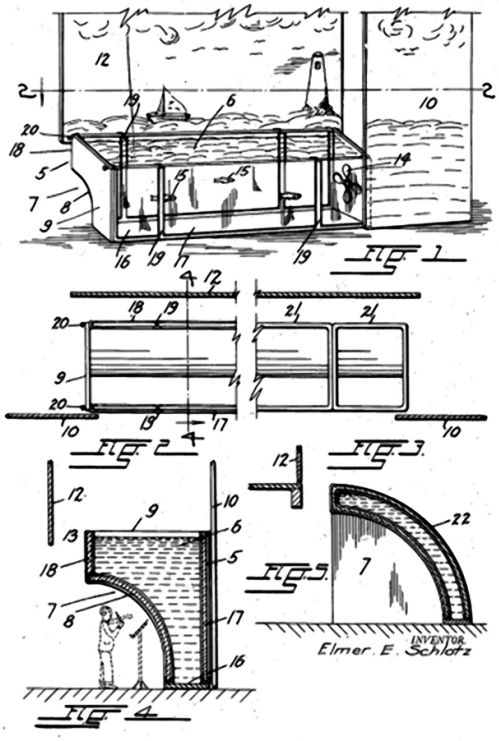
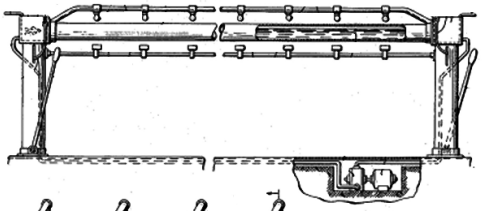


Figure 109-1991149. 1935: Elmer E. Schlotz's illusion apparatus.



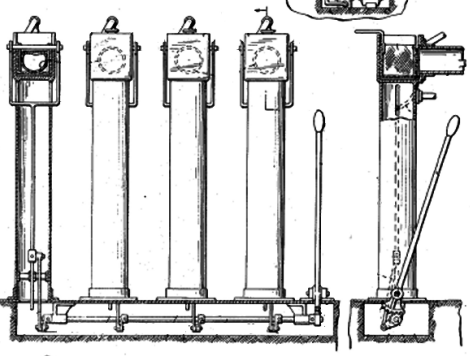


Figure 110-2117616. 1938: Irving I. Levenstein's fish race track.

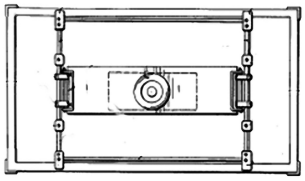
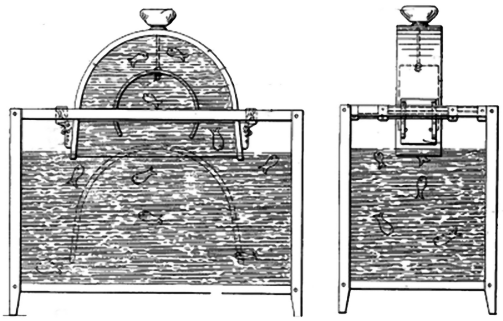
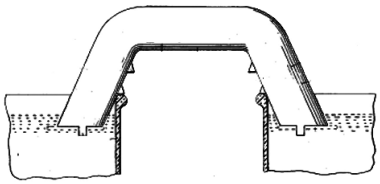


Figure 111-1943417. 1934: George W. Bringman's arch aquarium.





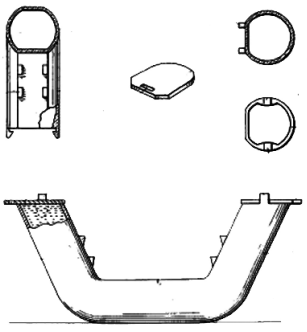


Figure 112-2059927. 1935: Oscar G. Beck's fish bridge.

thermore the design was inherently unstable so I, for one, would not like to have been standing anywhere it ☺!

Another screwball invention was that assigned to Irving I. Levenstein of Brooklyn in 1938 (Figure 110-2117616). It consisted of a number of horizontal glass tubes or raceways into which were placed the piscatorial contestants (Levenstein suggested goldfish or "…other small species…"). A pump was situated in the bottom of the contraption and conveyed water through the raceways towards the starting point to stimulate the fish to swim. The inventor suggested that the flow of water could be increased to drive the fish back to their starting gates after the race was over. The handle opened up all the starting chambers simultaneously, a detail of the chambers being shown at the bottom of the drawing. Levenstein even suggested that, to indicate the progress of the race photoelectric cells could be employed, along with a bank of indicator lights ☺!

One of the really odd tank designs of this period took its inspiration from the arched birdcage aquarium patented in 1877 by Matthew Palen and Daniel Sexton. This was conceived in 1934 by George W. Bringman of Cleveland, but the arch in this case was submerged in the aquarium after first loosening a valve near its top to permit the water to enter (Figure 111-1943417). After fully filled with water, the valve was closed and the arch was then raised and placed on two crossbars. The fish could then swim from the main tank through the arch and back again. A fish bridge design created to unite two separate aquariums was patented by Oscar G. Beck of Herrick, Illinois in 1935 (Figure 112-2059927).

We'll begin our discussion of aquarium designs in this decade with combination configurations, starting with the one by Adolf W. Krieger of Brooklyn in 1935 (Figure 113-2000451). This included an aquarium, a bird cage, and several, plant containers. The creation of Robert Furrey of Council Bluffs, Iowa in 1938 was another that combined an aquarium with plant containers (Figure 114-D109478). However, "less us more" is not the basis for these two rather intricate designs ☺!

Flat fish bowl designs in this decade were advanced by Michael S. Desser of Toledo, Ohio in 1935 (Figure 115-D97041) and another with his co-inventor, Edwin W. Fuerst in 1936 (Figure 116-D102550). Both are very nice artistic variations of the plain, flat-sided fish bowl.

Globe designs abounded, including those by Arthur von Frankenberg of New York City in 1929 (three figures holding a globe—Figure 117-D80204), followed by that in 1931 of Mitsuo Matsuno also of

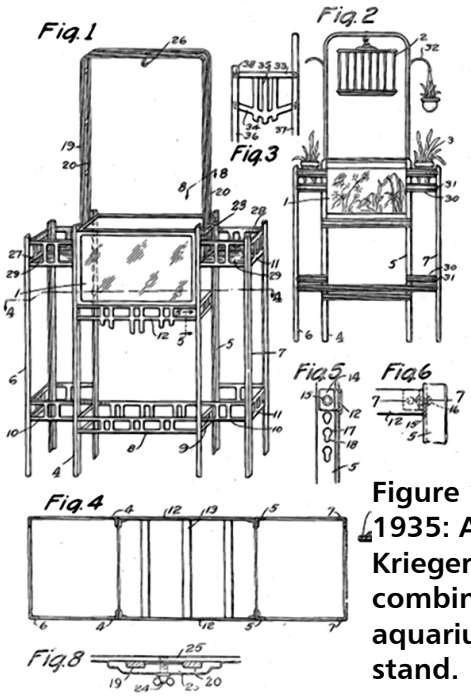
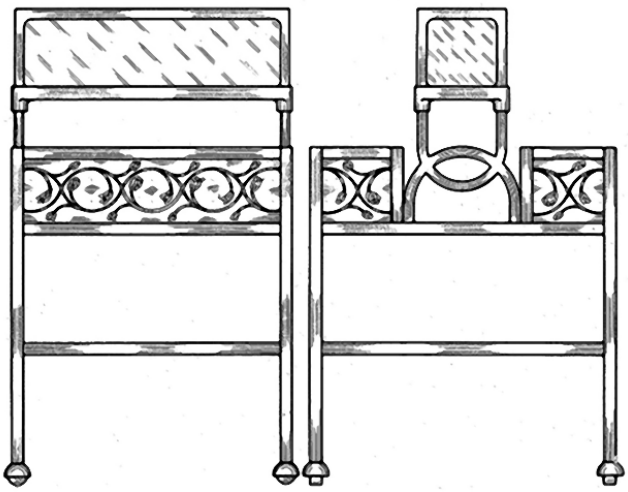


Figure 113-2000451. 1935: Adolf W. Krieger's combination aquarium and plant stand.

Figure 114-D109478. 1938: Robert Furrey's combination aquarium and plant stand.



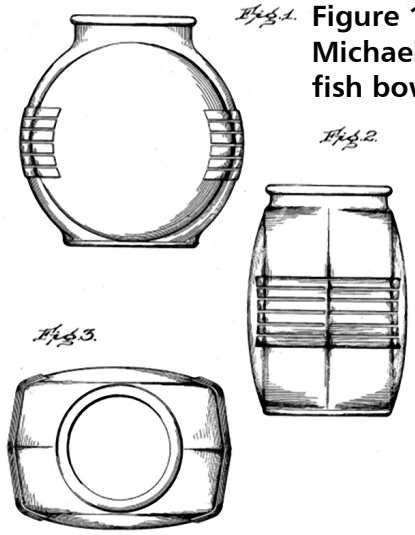


Figure 115-D97041. 1935: Michael S. Desser's flat fish bowl design.

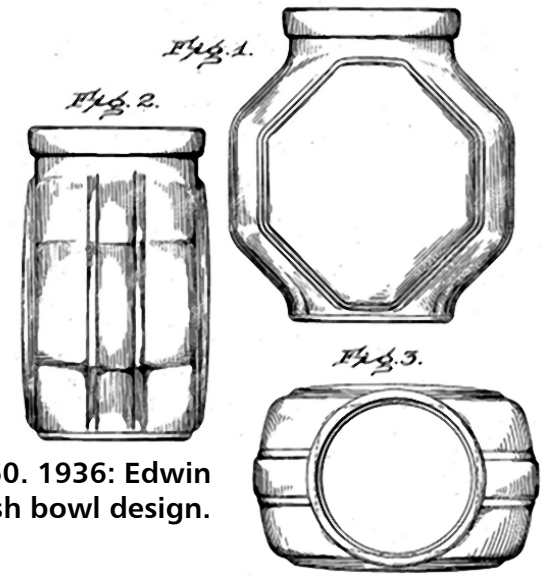


Figure 116-D102550. 1936: Edwin W. Fuerst's flat fish bowl design.

Figure 117-D80204. 1936: Arthur von Frankenberg's fish globe design.

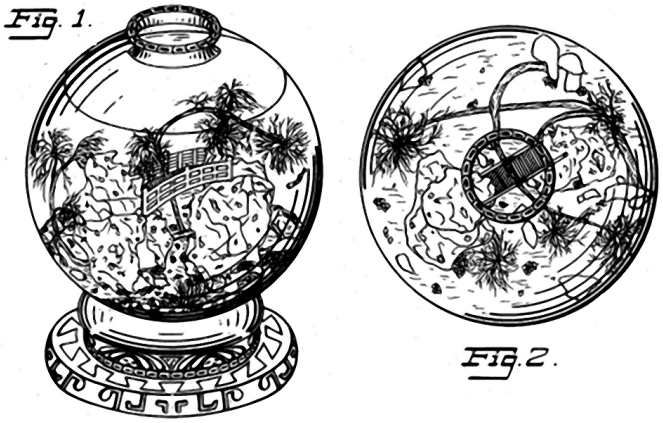
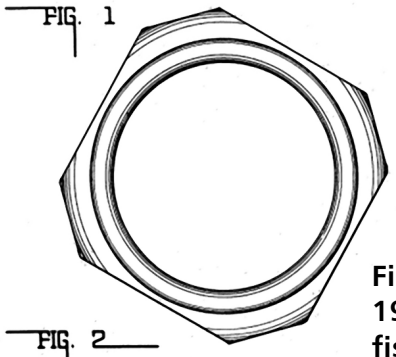


Figure 118-D85253. 1931: Mitsuo Matsuno's fish globe design.



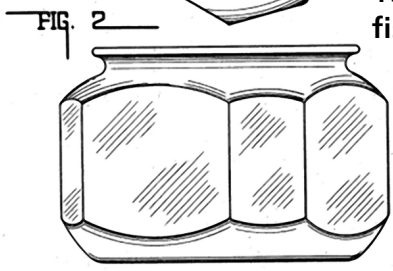


Figure 119-D89307. 1933: David A. Jenkins's fish globe design.

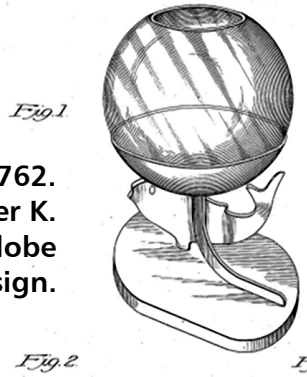
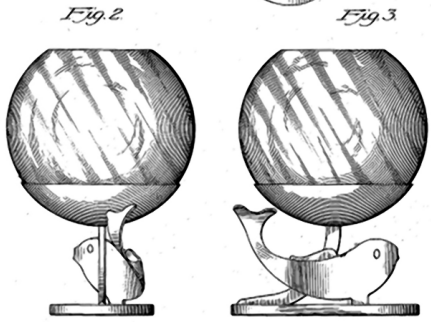


Figure 120-D98762. 1936: Lester K. Franklin's fish globe design.



New York City (a bowl with a Japanese motif—Figure 118-D85253), David A. Jenkins of Kokomo, Indiana in 1933 (an octagonal bowl with flat sides—Figure 119-D89307), and Lester K. Franklin of Chicago in 1936 (a globe held up by a flat-sided fish—Figure 120-D98718).

Rectangular designs were represented by those of Hermann Hufner of New York City in 1931 (a scalloped frame with round embellishments—Figure 121-D85181), Thomas W. McCreary of Monaca, Pennsylvania in 1932 (an aquarium with a shelf-Figure 122-D86325), John J. Halterbeck of Long Island City, New York in 1932 (a tapered frame aquarium—Figure 123-D86914), and Arthur P. Swanson of Maine Township, Illinois in 1934 (a tall aquarium with a scalloped frame—Figure 124-D93365). Unfortunately, since his was a design patent, McCreary did not explain the purpose the shelf in his design served.

One very modern looking fountain aquarium was patented during this decade, that by Nathan Taslitt of Hartford, Connecticut in 1934 (Figure 125-1965323). There were, however, a number of lamp aquariums patented, starting with that of Charles Emma of Philadelphia in 1929 (Figure 126-1723272), Motogo Jyumi of Oakland, California in

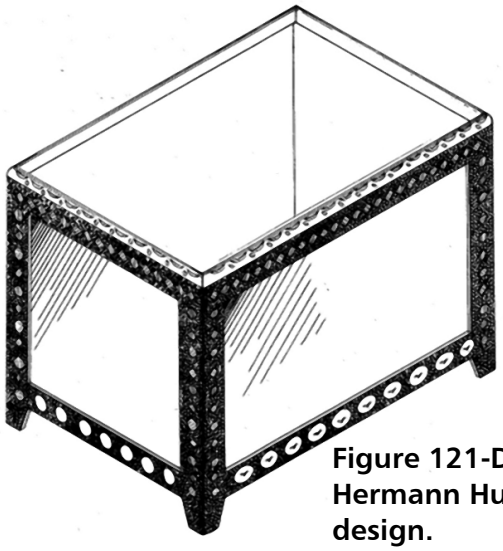


Figure 121-D85181. 1931: Hermann Hufner's rectangular design.

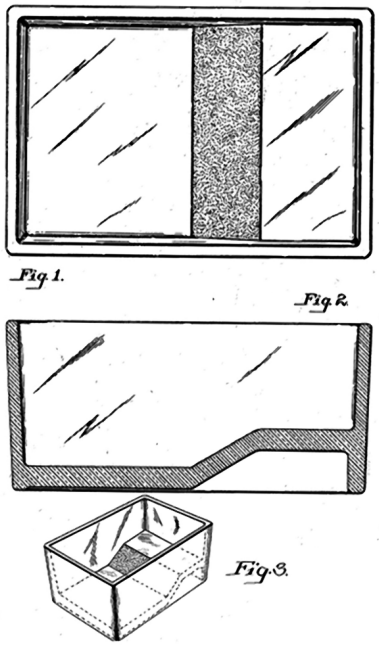
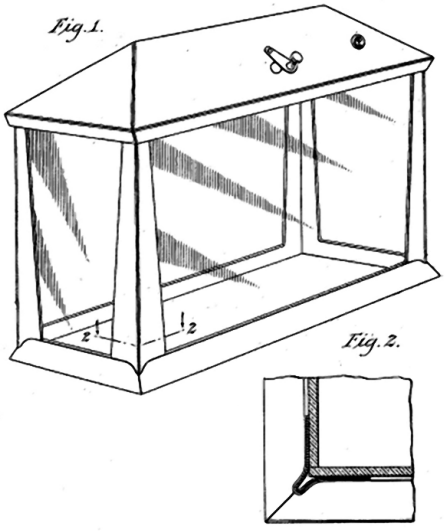


Figure 122-D86325. 1932: Thomas W. McCreary's all-glass shelf tank.

Figure 123– D86914. 1932: John J. Halterbeck's tapered frame aquarium.



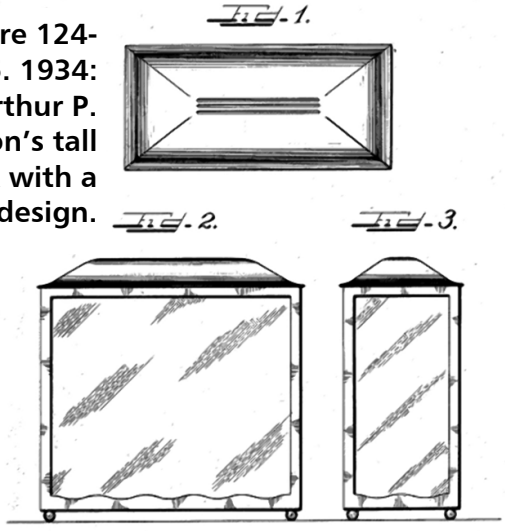


Figure 124-D93365. 1934: Arthur P. Swanson's tall tank with a scalloped design.

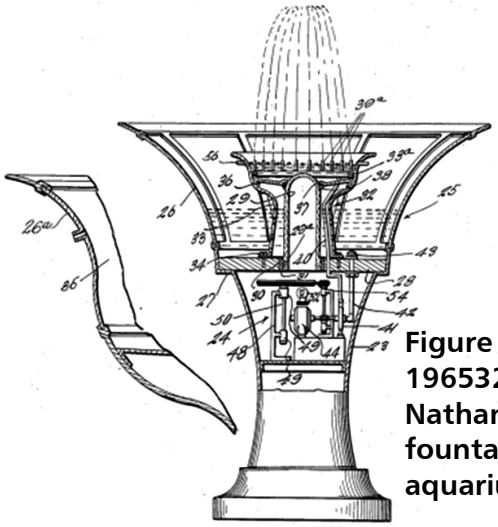


Figure 125- 1965323. 1934: Nathan Taslitt's fountain aquarium.

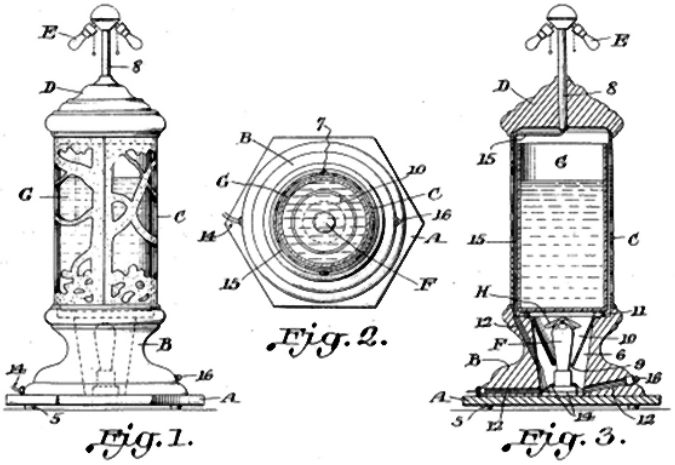


Figure 126– 1723272. 1929: Charles Emma's lamp aquarium.

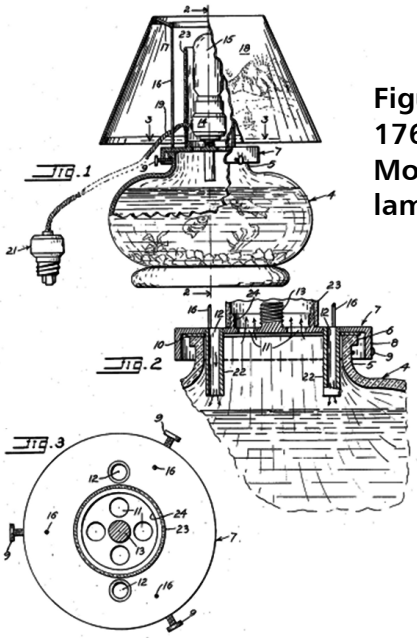
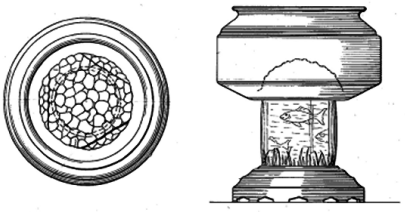


Figure 127- 1762634. 1930: Motogo Jyumi's lamp aquarium.



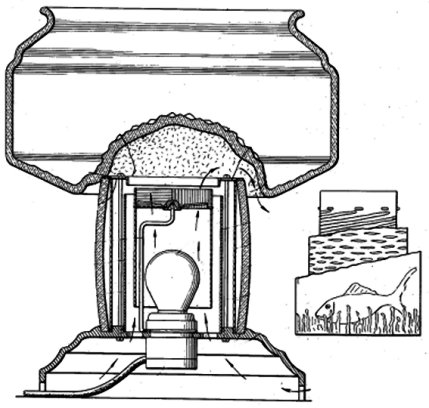


Figure 128- 1871742. 1931: Albert Sabath's lamp aquarium.

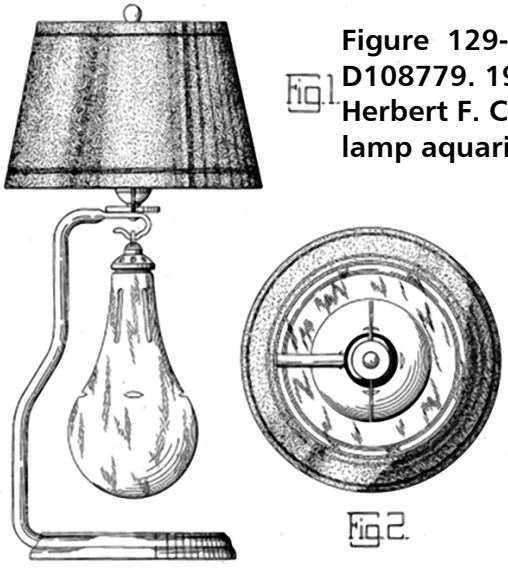


Figure 129- D108779. 1938: Herbert F. Crewse's lamp aquarium.

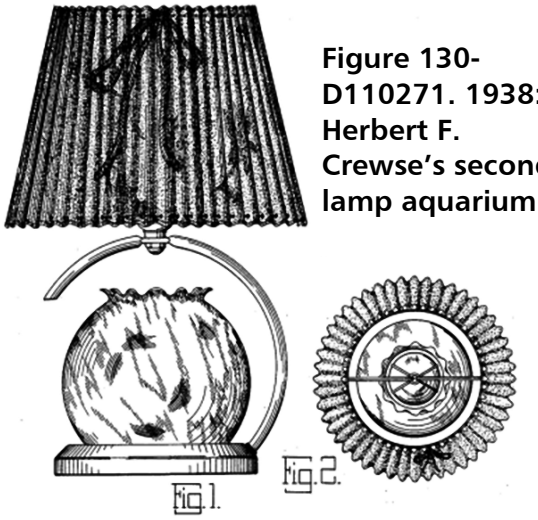


Figure 130- D110271. 1938: Herbert F. Crewse's second lamp aquarium.

1930 (Figure 127-1762634), Albert Sabath of Chicago in 1931 (Figure 128-1871742), and two by Herbert F. Crewse of Des Moines, Iowa in 1938 (Figure 129-D108779 and Figure 130-D110271). An innovative feature of Jyumi's design was the positioning of air tubes within the bowl to insure a convention circulation of air within the bowl. Sabath's design was especially interesting in that a lamp and a fan were situated within the clear glass chimney that supported the fish bowl. Within the chimney was a cylindrical screen that rotated as the warmed air rose. The screen could be painted with any aquarium subject, fish being pictured in the drawing. A colored lamp could also provide additional pictorial interest. The aquarium in Crewse' first patent featured an unusual, pear-shaped globe.

Four wall aquarium patents were awarded during this decade – those by Charles Trovato of Corona, New York in 1930 (Figure 131-1777944), Isador Greensaft of Belmar, New Jersey in 1934 (Figure 132-1974068), Harry J. Kelly of Nashville, Tennessee in 1935 (Figure 133-1991683), and Morris Skolnick of New York City in 1937 (Figure 134-2144551). Trovato's design was interesting, being half-picture and half aquarium (the lower half). Greensaft illuminated his tanks from the bottom with three lamps directly below glass-topped cylinders, and projected them a distance into the tank so as not to have the gravel block the light. There were, of course, a number of inherent problems with wall aquariums: (1) they had to be firmly attached to the wall studs (and many houses of the time had plaster lath walls where the studs were hard to locate), (2) the tanks had to be

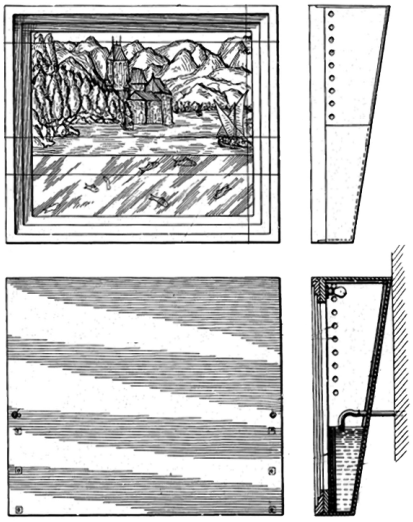


Figure 131-1777944. 1930: Charles Trovato's wall aquarium.

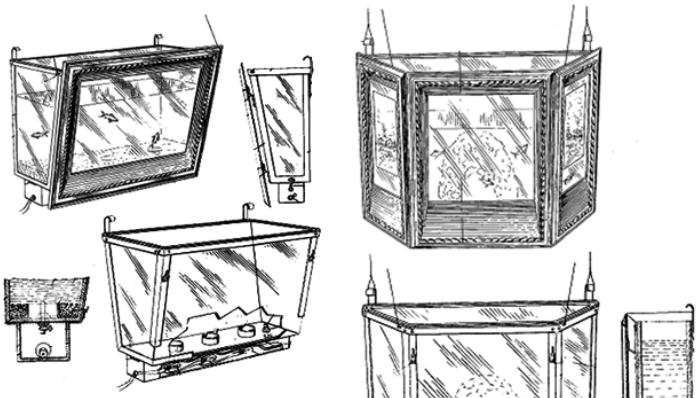


Figure 132-1974068. 1934: Isador Greensaft's wall aquarium.

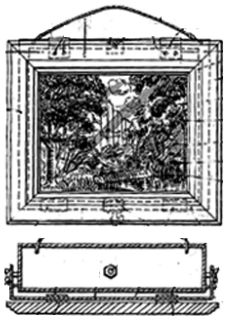
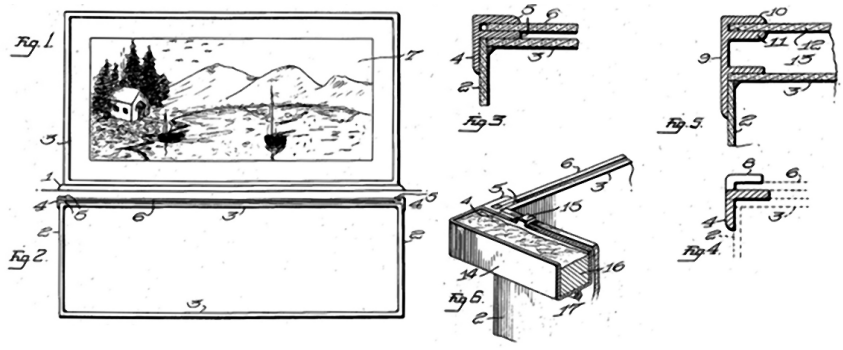


Figure 134-2144551. 1937: Morris Skolnick's wall aquarium.

Figure 133-1991683. 1935: Harry J. Kelly's wall aquarium.



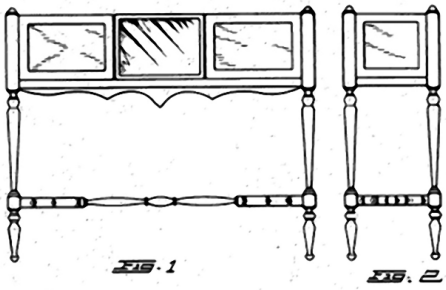
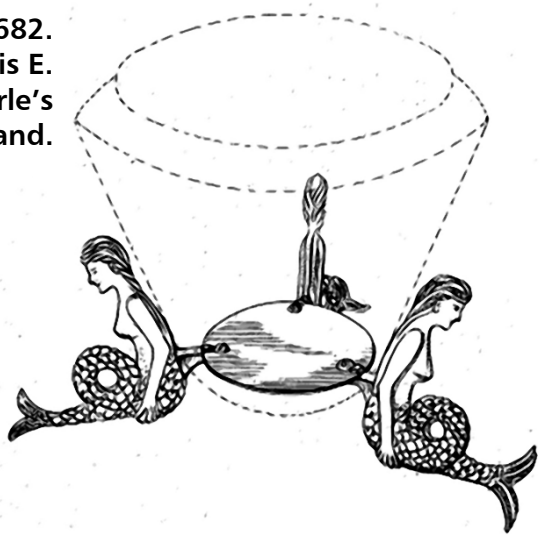


Figure 136-D78682. 1929: Lewis E. Wackerle's aquarium stand.



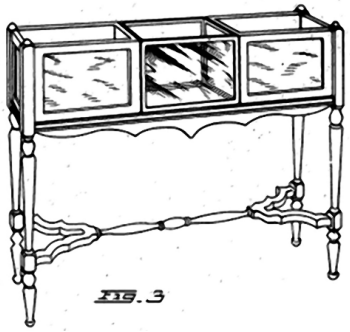


Figure 135-D78013. 1929: Harvey H. Downie's aquarium stand.

Figure 138-D8-865. 1930: Sanders C. Simpson's aquarium stand.

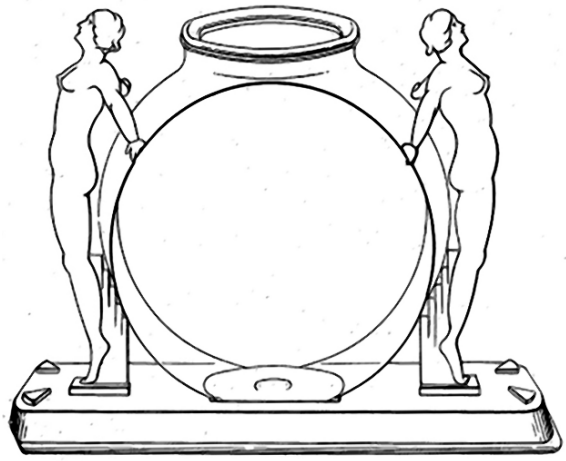
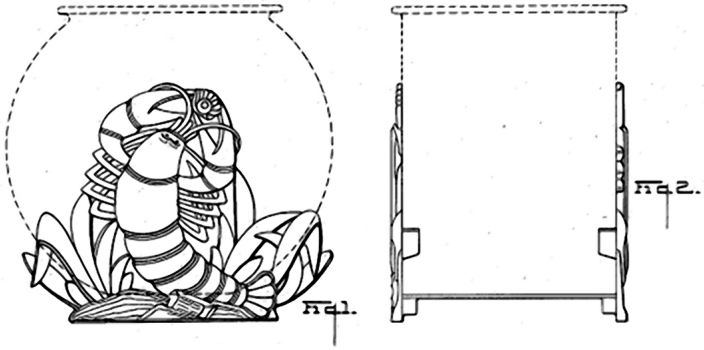
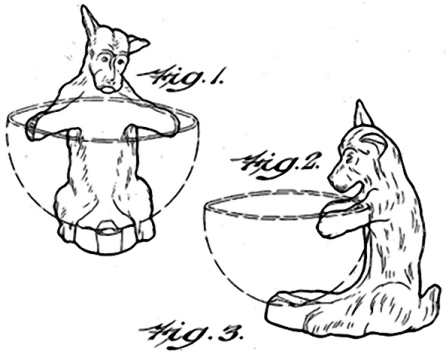


Figure 137-D80395. 1930: Joseph Schlagheck's aquarium stand.





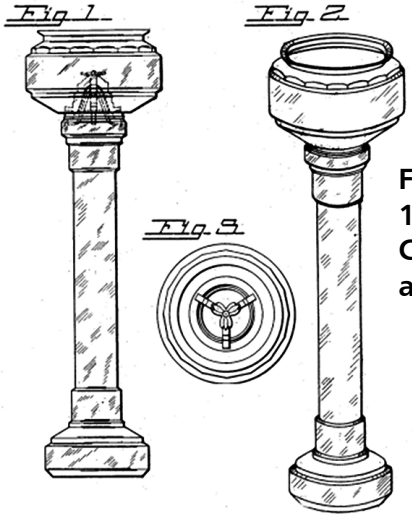


Figure 139-D85413. 1931: Roy E. Castetter's aquarium stand.

Figure 140-D100200. 1931: Samuel J. Carnes' aquarium stand.

located where studs were available, (3) the tanks were necessarily small because their widths had to be narrow, and (4) they had to be located where furniture did not interfere with access to the tanks. Because of these problems, these designs were of limited use.

Six designs for aquarium stands were patented during this decade, starting with that of Harvey H. Downie of Seattle, Washington in 1929 (a combination fernery and aquarium stand—Figure 135-D78013), Lewis E. Wackerle of Chicago in 1929 (three mermaids holding a fish bowl—Figure 136-D78682), Joseph Schlagheck of Toledo Ohio in 1930 (marine creatures holding a fish globe—Figure 137-D80395), Sanders C. Simpson of Woodcliff, New Jersey in 1930 (two nudes holding a flat-sided fish bowl—Figure 138-D80865), Roy E. Castetter of Wyoming, Ohio in 1931 (Figure 139-D85413), and Samuel J. Carnes of Camden, Arkansas in 1936 (a dog holding a fish bowl—Figure 140-D100200).

We now examine a number of novelty aquariums that seemed to be the rage during this decade. The first was the 1932 brainchild of Gaspar R. Bossetta of New Orleans, Louisiana 1932 (Figure 141-1858181). Bossetta's design showed a twelve-sided aquarium with a glass figurine of a bird above it. When the time came for a change of water, the bird-was filled with water where it dripped from its beak into the aquarium, thus providing aeration as well. One leg of the birdserved as an overflow tube for the excess water.

Four of these novelty designs emerged from the imagination of Larry Venditti of Philadelphia. In all of these designs the aquariums were covered with stones that made them look like miniature grottos, and a light bulb enclosed in a glass bell jar was built into the bottom of each of them to provide illumination. His first design (1930) was of a trapezoidal shape (Figure 142-D82230), his second design (1931) was in the shape of an arrowhead (Figure 143-D83137) and his third design (1932) was in the shape of a triangle (Figure 144-1860698). His fourth design (1933) also was in the shape of triangle but three vertical posts were added that held the aquarium up a short distance from the table (Figure 145-1908939). The posts in this version were made of a translucent or transparent material so lamps could be enclosed in these as well if desired. Vandetti stated that his aquaria could also be designed in other shapes.

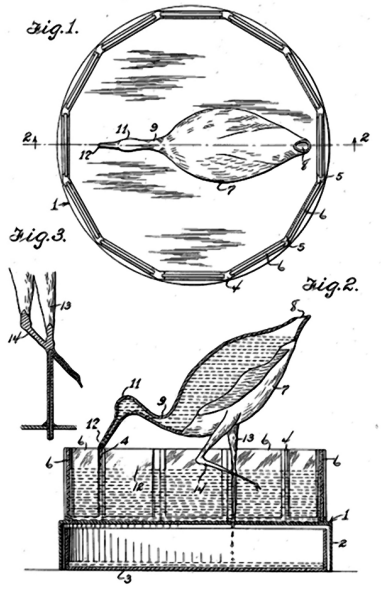


Figure 141-1858181. 1932: Gaspar R. Bossetta's novelty aquarium.

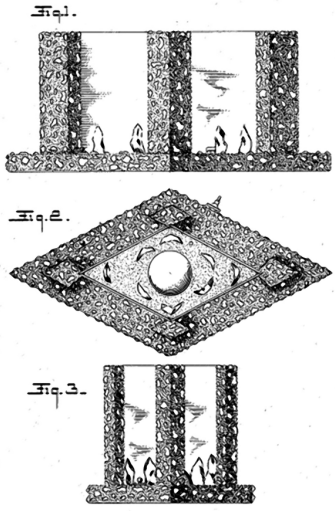


Figure 142-D82230. 1930: Larry Venditti's first novelty aquarium.

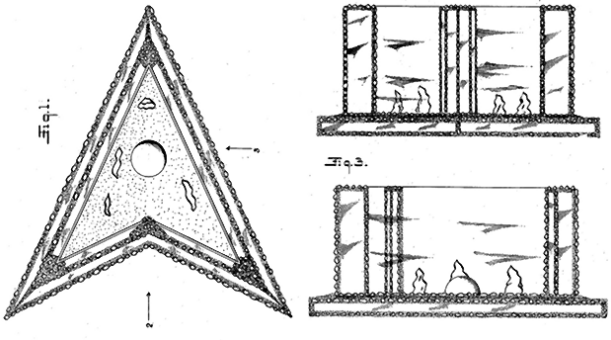


Figure 143-D83137. 1930: Larry Venditti's second novelty aquarium.

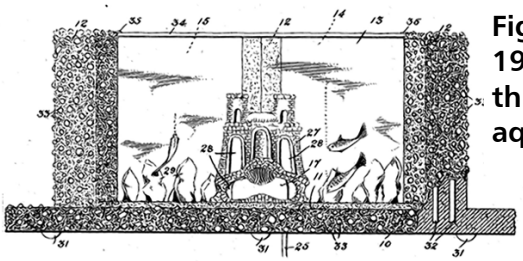
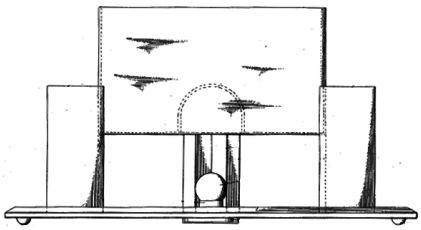


Figure 144-1860698. 1932: Larry Venditti's third novelty aquarium.



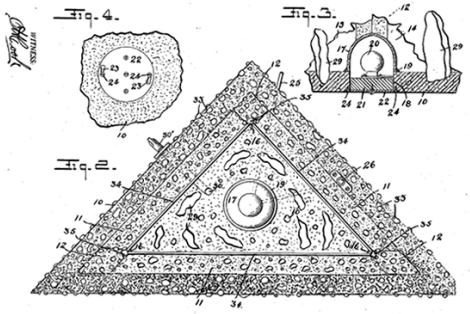
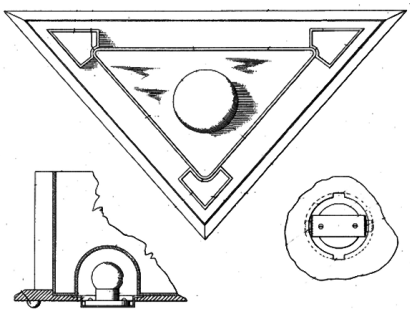


Figure 145-1908939. 1933: Larry Venditti's fourth novelty aquarium.



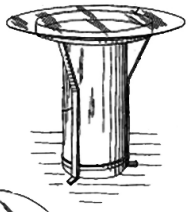
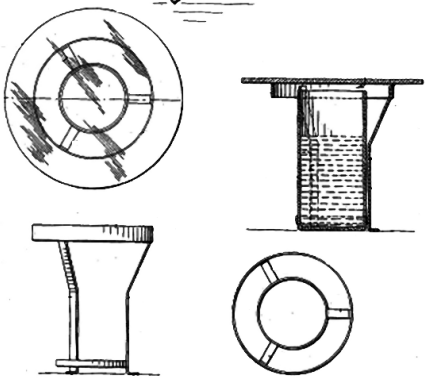


Figure 146-2133740. 1937: Stephan E. Donohoue's table aquarium.



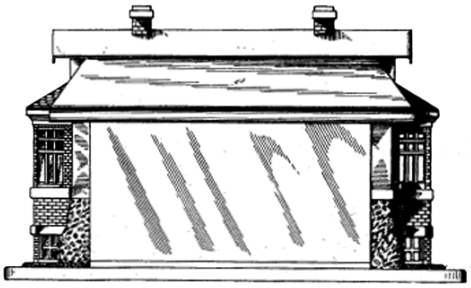


Figure 147-D83044. 1930: Hans C. Jensen's novelty aquarium design.

Figure 148-D84002. 1931: Floyd G. Smith's novelty aquarium design.

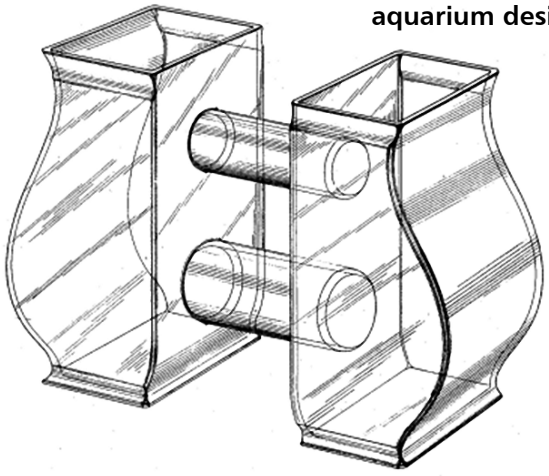
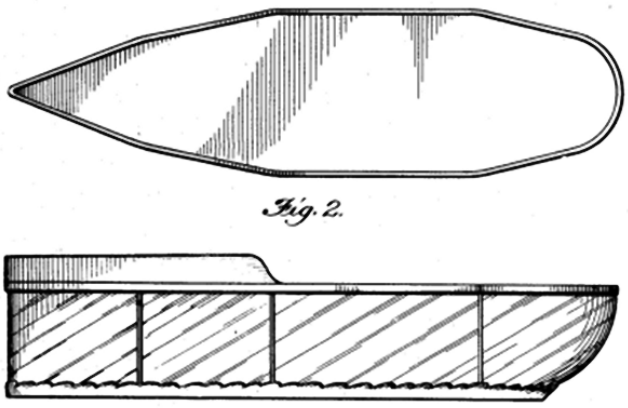


Figure 149-D85201. 1931: Valerius Pomernacki's novelty aquarium design.



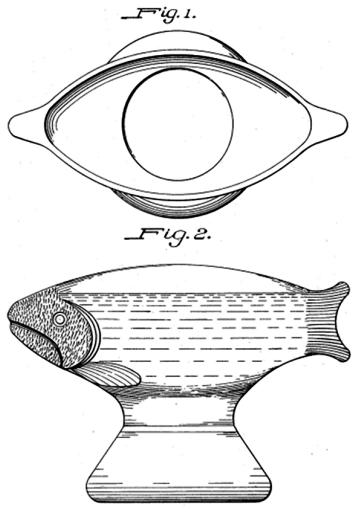


Figure 150-D86002. 1932: Charles M. Wibel's novelty tank.

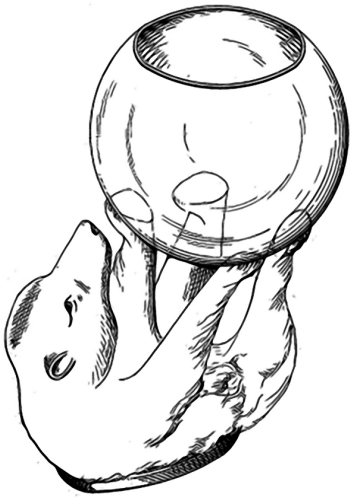


Figure 151-D90032. 1933: Soovia Janis' novelty tank.

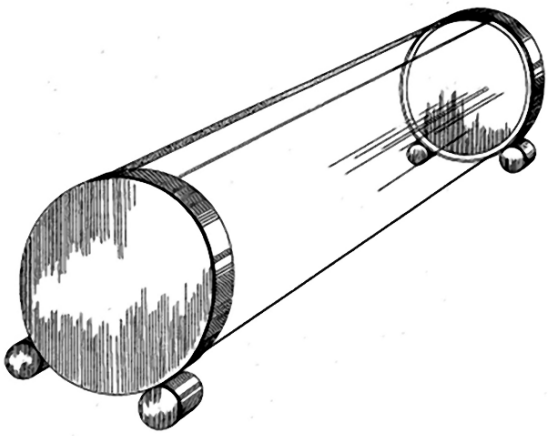


Figure 152-D90041. 1933: Russel Wright's horizontal tube aquarium.

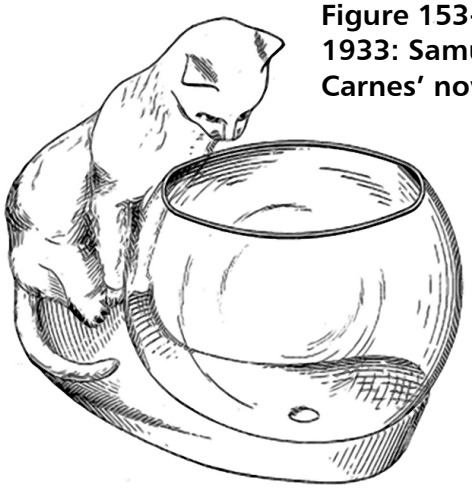


Figure 153-D90646. 1933: Samuel J. Carnes' novelty tank.

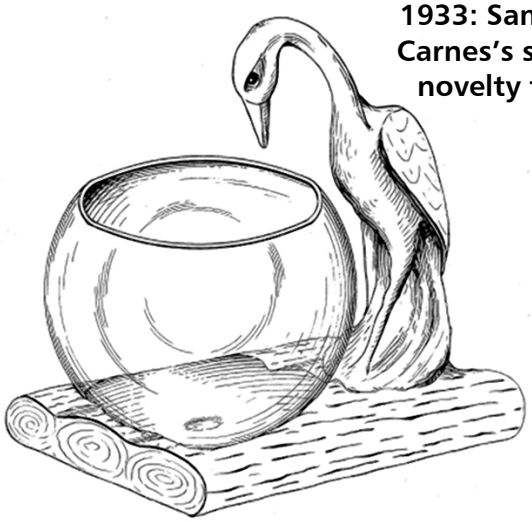
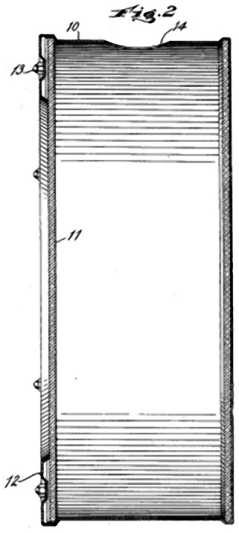


Figure 154-D90647. 1933: Samuel J. Carnes's second novelty tank.

The first table aquarium design was assigned to Stephan E. Donohoue of Charleston, West Virginia in 1937 (Figure 146-2133740). Unfortunately, Donohoue did not supply any details as to how access to the aquarium for feeding and cleaning was obtained. The assumption is that the glass top attached to the support legs was simply lifted off the aquarium. The possibility for breakage during such maneuvers was, of course great, since table glass of this size is heavy.

A plethora of design patents for novel aquariums characterized this decade, including those of Hans C. Jensen of Chicago in 1930 (an aquarium in the form of a house–Figure 147-D83044), Floyd G. Smith of Petersburg, Florida in 1931 (two tanks connected via two tubes the fish could swim through – Figure 148-D84002), Valerius Pomernacki of Chicago in 1931 (shaped like a boat – Figure 149-D85201), Charles M. Wibel of Mount Pleasant, Pennsylvania in 1932 (shaped like a fish – Figure 150-D86002), Soovia Janis of New York City in 1933 (a bear holding a fish bowl – Figure 151-D90032), Russel Wright in 1933 (an aquarium in the form of a horizontal tube – Figure 152-D90041), two from Samuel J. Carnes of Camden, Arkansas in 1933 (a cat looking over a fish bowl–Figure 153-D90646, and a bird overlooking a fish bowl – Figure 154-D90647), William E. McCormick of New York City in 1933 (an aquarium in the shape of a porthole – Figure 155-D92416), Oscar M. Shannon of Larchmont, New York in 1934



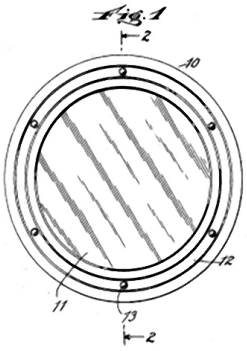


Figure 155-D92416. 1933: William E. McCormick's porthole tank.

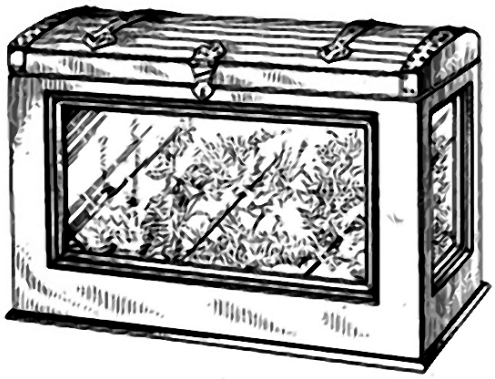


Figure 156-D92776. 1934: Oscar M. Shannon's treasure chest tank.

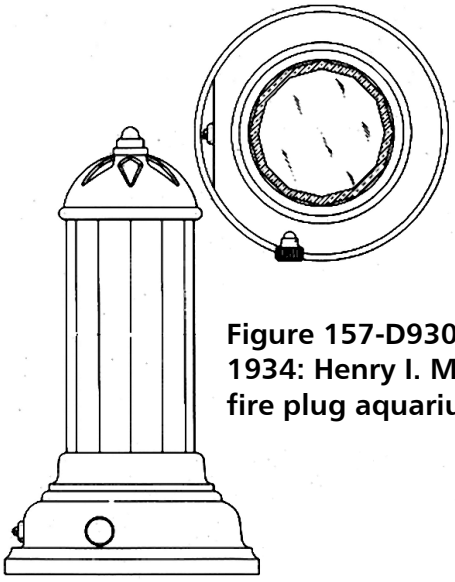


Figure 157-D93033. 1934: Henry I. Miller's fire plug aquarium.

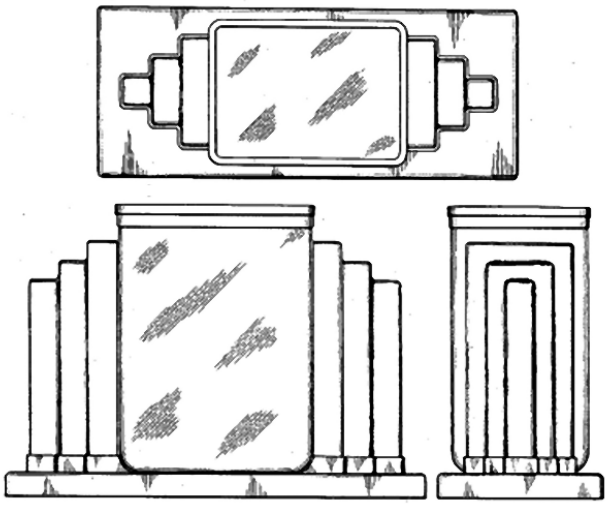


Figure 158-D94058. 1934: Arthur P. Swanson's Art Deco design.

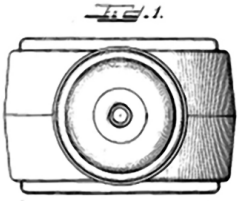


Figure 159-D94058. 1935: Arthur P. Swanson's alarm clock aquarium.

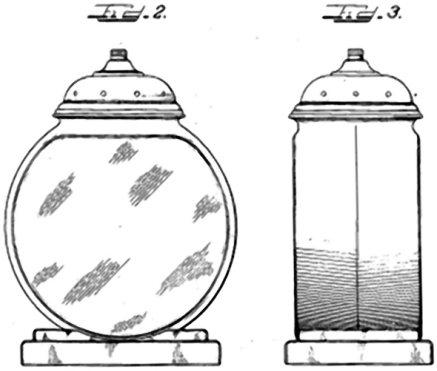
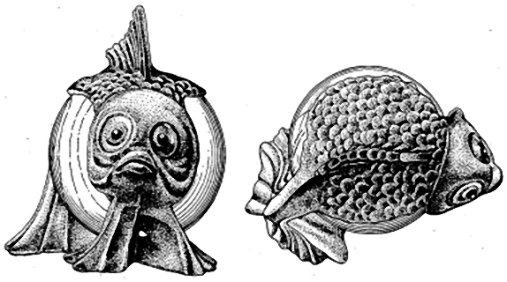
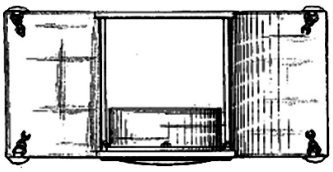


Figure 160-D94248. 1935: Charles P. Askew 's submarine aquarium.

Figure 161-D97759. 1935: Samuel J. Carnes fish globe within a fish.





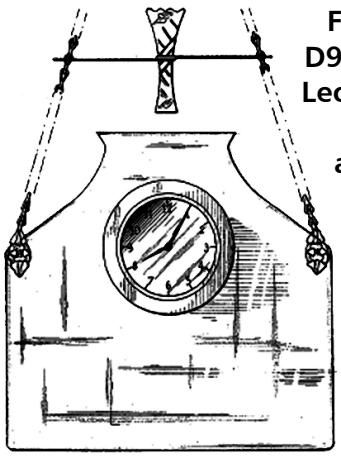


Figure 163-D96947. 1935: Leopold Weiss' hanging aquarium.

(an aquarium in the form of a treasure chest – Figure 156-D92776), Henry I. Miller of St. Louis, Missouri in 1934 (an aquarium in the shape of a fire plug – Figure 157-D93033), Arthur P. Swanson of Maine Township, Illinois in 1935 (an Art Deco design – Figure 158-D94058) and another in 1934 (an aquarium in the shape of an alarm clock –Figure 159-D94258), Charles P. Askew of Marion, Indiana in 1935 (an aquarium in the shape of a submarine – Figure 160-D95727), Samuel J. Carnes of Camden, Arkansas in 1935 (a globe aquarium within a fish – Figure 161-D97759) and Lester K. Franklin of Chicago in 1936 (a fish bowl on a stand containing a flamingo and cattails – Figure 162-D98718). I'll single

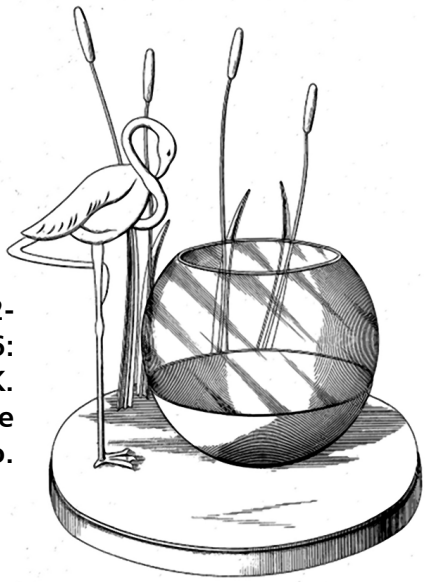


Figure 162-D98718. 1936: Lester K. Franklin's globe with a flamingo.

out the last, awarded to Leopold Weiss of New York City in 1935 (Figure 163-D96947) because of its two distinctions: it was a hanging aquarium, and it had a built-in clock ☺! Since these were all design patents, there are no details other than what can be seen in the drawings.

WORLD WAR II: THE DECADE OF 1939-1948

This was the decade of World War II and perforce the number of aquarium patents dwindled to a mere trickle compared to the previous ten years, i.e., 13 versus 75. We'll start off with three patents that dealt with aeration and filtration. The first was issued to John L. Magnus of Washington, DC in 1939 (Figure 164-2172799). It is interesting to quote from the inventor: "…aeration of aquariums is becoming recognized as essential in this industry or hobby." Magnus – a well-known name in hobby in the previous decade – designed an aeration scheme that aerated from beneath the surface of the water and above as well, He accomplished this by designing a fan that incorporated an air pump, using the fan blade shaft to power the piston of the air pump. The fan was directed across the surface of the water, cooling it by evaporation. This was a very ingenious design, although bulky and cumbersome in its implementation.

A combination aeration and filtering system was developed by James F. Haldeman of Martinsville, Indi-

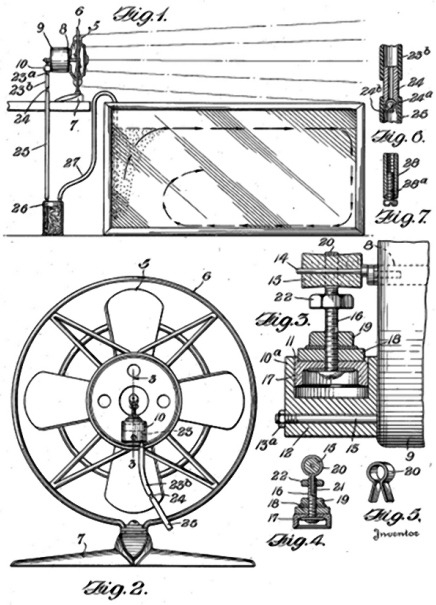


Figure 164-2172799. 1939: John L. Magnus' aerator and filter.

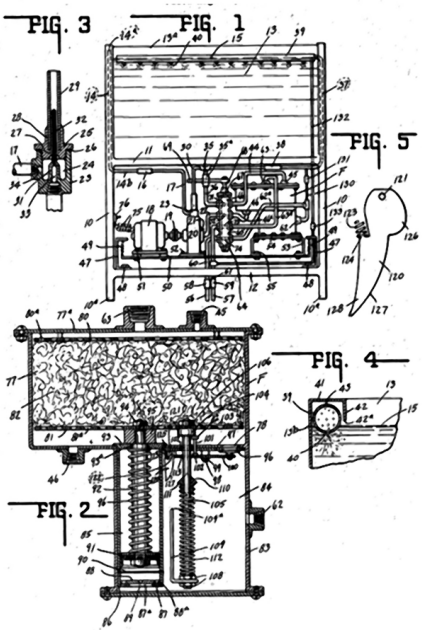
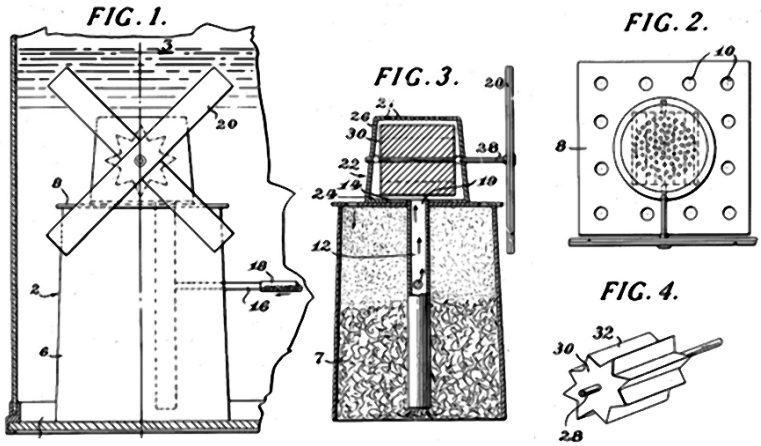


Figure 165-2253516. 1941: James F. Haldeman's aeration and filtration system.

Figure 166-2732341. 1946: Donald W. Huff's windmill aerator and filter.



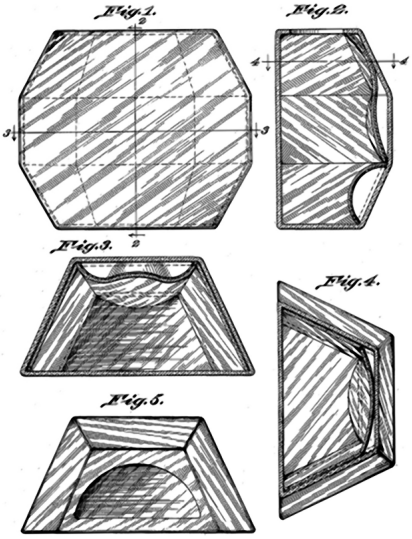
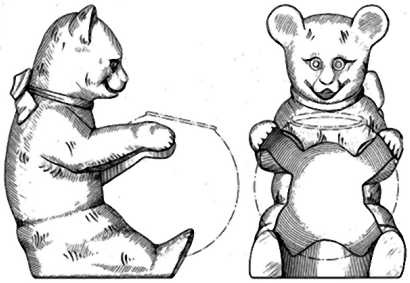


Figure 167-D125884. 1941: Floyd J. Daughtry's trapazoidal aquarium.

Figure 168-D136064. 1943: Charles L. Fordyce's Teddy bear aquarium.



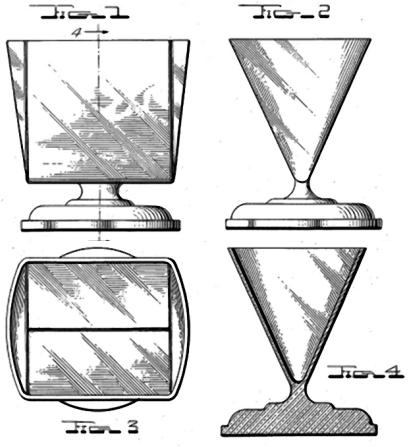


Figure 169-D136624. 1943 Alexander F. Richards' triangular aquarium.

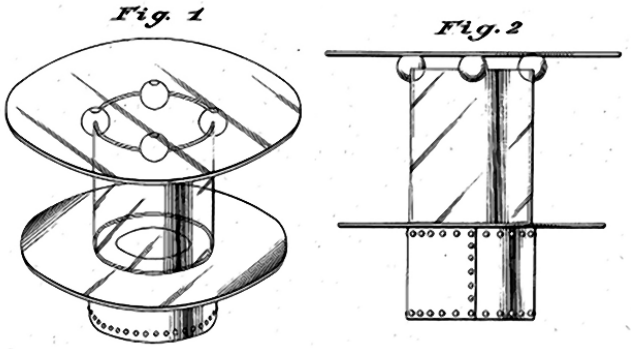


Figure 170-D149043. 1948: Lawrence A. Bouligny's table aquarium.

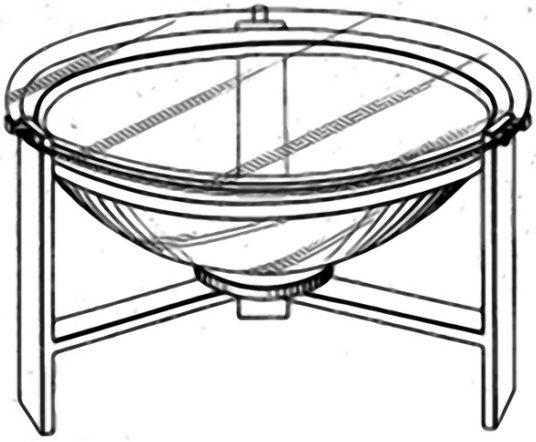


Figure 171-D148608. 1948: Alden D. Bullock's table aquarium.

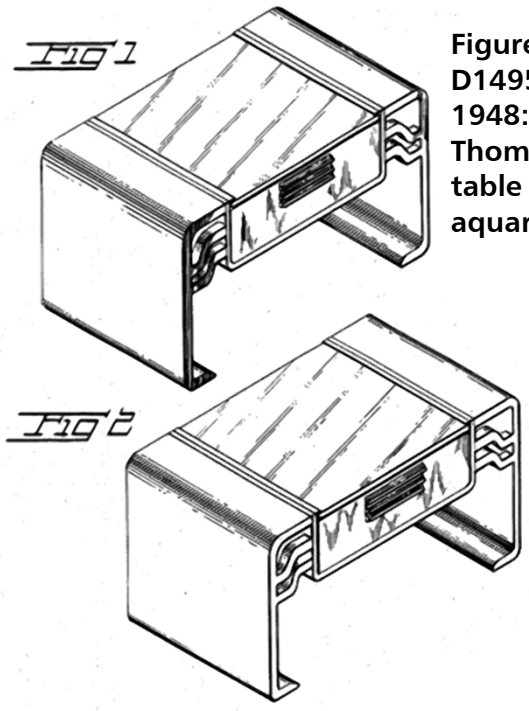


Figure 172-D149527. 1948: Judy Thomas' table aquarium.

ana in 1941 (Figure 165-2253516). The aeration was produced by an air/water injector, the water supplied by the aquarium itself. Since the aquarium water also circulated below the tank, it was filtered in a chamber located at position F at the right of the diagram. The filter was designed so that it could be backwashed and cleaned without removal of the filter medium. There was a normal filtration and aeration cycle and also a filter washing cycle, using the opening or closing of a valve to switch between cycles. The design also ensured that any splashing of the water from the air/water injector was minimized. Furthermore, the equipment was mounted in such a fashion as to minimize any vibrations that might be conveyed to the aquarium. This was an ambitious design, but one better suited to large aquariums.

The creation of Donald W. Huff of Peekskill, New York in 1946 was an odd one, a combination filter and aerator in the form of a windmill (Figure 166-2732341). The air from an air pump (not shown) entered the center tube (12) from an air line, 16. The air lift drew water up into the filter (the water being drawn into the filter via the holes, 10) and then in the process of falling down hit the cam shown in Fig. 4, rotating it and thus driving the windmill. The aerated water entered the tank via the holes in the cam housing. Huff claimed that the windmill arms would serve to agitate and circulate the water. Although there is no reason to think that this invention would not work, I'd place it in the Rube Goldberg category although it would certainly be a conversation piece at any party ☺!

Three fish globe design patents were assigned in this decade. The first was to Floyd J. Daughtry of Tyler, Texas in 1941 (trapezoidal with a flat side–Figure 167-D125884), then to Charles L. Fordyce of Brooklyn, New York in 1943 (a Teddy bear holding a fish globe–Figure 168-D136064), and finally to Alexander F. Richards of Mayport Pennsylvania in 1943 (a modernistic design with a triangular cross-section–Figure 169-D136624).

The year 1948 was a bonanza year for table aquarium designs, featuring those by Alden D. Bullock of Seattle, Washington (an inverted dome – Figure 171-D148608), Lawrence A. Bouligny of Miami, Florida

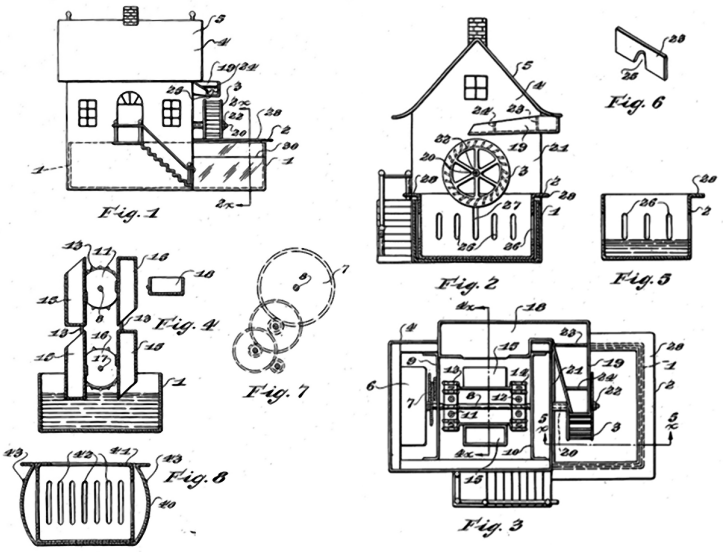


Figure 173-2272582. 1942: Alfred Poppe's toy house with water wheel design.

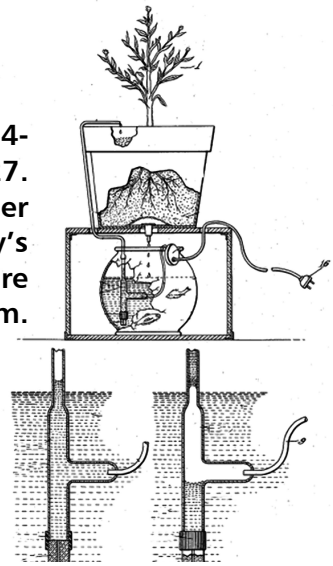


Figure 174-2306027. 1942: Miller W. Swaney's hydroculture aquarium.

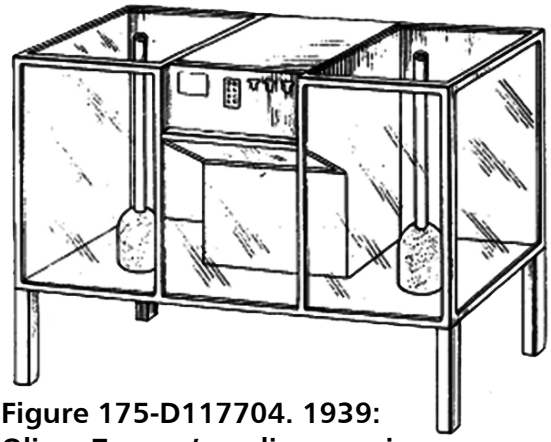


Figure 175-D117704. 1939: Oliver Zenzen's radio aquarium.

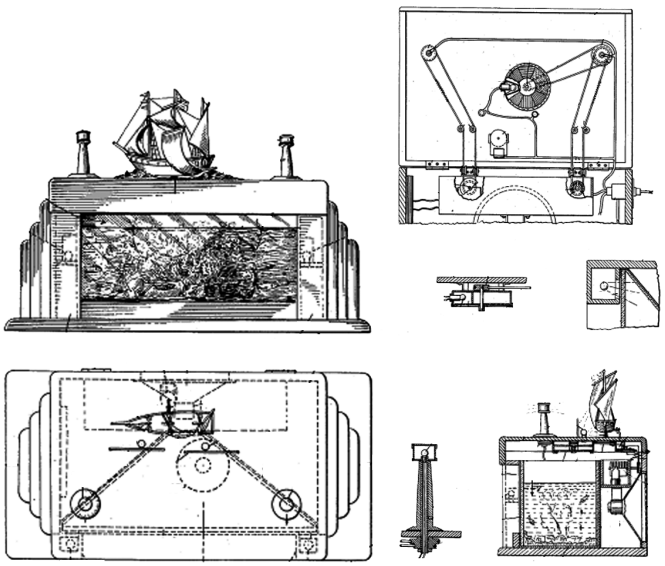


Figure 176-2293612. 1942: Elwood J. Montague's radio aquarium.

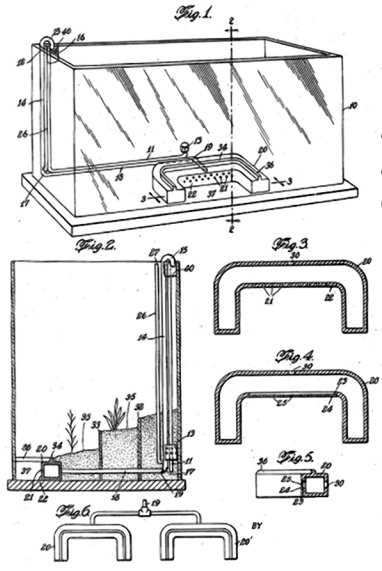


Figure 177-2491853. 1949: Louis Feldman's aeration, filtration, and cleaning design.

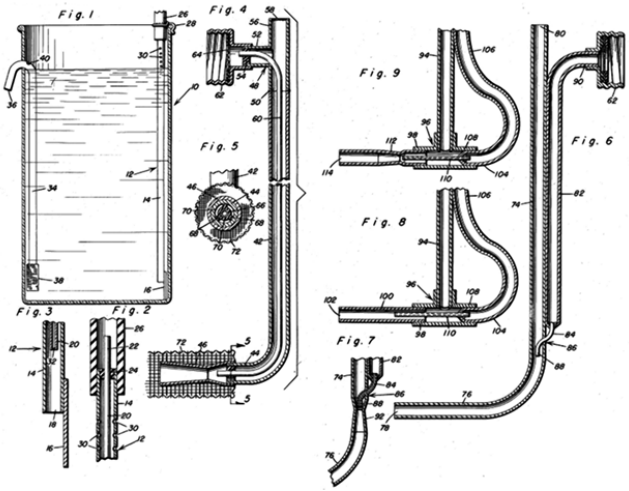


Figure 178-2772867. 1956: Howard R. Cleckner's aerator.

(round–Figure 170-D149043), and Judy Thomas of Los Angeles, California (rectangular–Figure 172-D149527). Since these table designs and the fish globe designs just mentioned were design patents, no information was given as to how these aquariums were to be maintained. This is especially unfortunate with the table designs, since these would require some clever engineering to supply concealed or otherwise unobtrusive filtration and aeration, and to provide for feeding and cleaning. The inventors simply glossed over these practical matters.

Alfred Poppe of Rochester, New York obtained a patent in 1942 for a toy house that combined a water wheel, a fish pond and a fish bowl (Figure 173-2272582). Water was lifted from the pond via the cups shown in Fig. 4 in the diagram to the top of the house where the water was released over the wheel, rotating it and aerating the water in the process (Fig 3. is the top plan of the house with its roof removed). Fig 1 is a front elevation of the house showing the fishpond extending out on the right side. The fishbowl (containing vertical slots, 26) was placed in the pond under the water wheel. The slots were located high enough so there was sufficient water in the fish bowl when it was removed to sustain the fish during the pond cleaning process. This was a very clever design for a novel aquarium that took into consideration the fact that aquariums do have to be cleaned regularly.

We leave this decade with a look at three decided oddities. The first was patented by Miller W. Swaney of Verona, New Jersey in 1942 (Figure 174-2306027) and involved the simultaneous hydroculture of species of plants and fish. Situated above an aquarium was a flowerpot, the plant in the pot being set in sand (there are two types of hydroponic plant culture: where the roots are in a liquid nutrient solution or in sand where a nutrient solution is allowed to flow over this aggregate). Water was raised from the aquarium to the flower pot via a small vibrator of the intermittent type, 8). To quote the inventor: "I have made the very unexpected discovery that goldfish and tropical fish, that are accustomed to existence in fresh water, live and thrive in nutrient plant solutions. I have found further that goldfish are capable of living in nutrient solutions containing dissolved copper and/or zinc (as their respective salts) in quantities generally conceded to be lethal to fish." The nutrient solution was placed directly into the aquarium where it was recycled into the flowerpot, the overflow returning the aquarium via the hole in the bottom of the pot. In addition to the inventor's nutrient solution (containing a complex mixture of salts that will not be described here but mainly include sodium, potassium, and magnesium salts, with trace salts containing iron, manganese, copper, and zinc), further nutrients were provided by the fish. This would be an interesting experiment even today for any aquarist of an experimental bent ☺!

The last two of these odd contrivances involved radio aquariums. The first was a design patent by Oliver Zenzen of Washburn Illinois in 1939 (Figure 175-D117704), so a description of how things worked is lacking. In 1942 a patent was awarded to Elwood J. Montague of Jamaica, New York for a radio aquarium that did provide considerable detail (Figure 176-2293612). The design was in the Art Deco mode and had a ship model on the top that was rocked by an electric motor to simulate the sailing of the ship. The tank was of triangular design in order to provide room for the radio equipment, but the interior of the cabinet had mirrors on both sides and the rear to impart an illusion of greater size. The controls for the radio were on the top of the cabinet and connected to it by a series of belts and pulleys. The tuning shaft belt actually rode around two shafts that were in the form of lighthouses. In fact, the radio could be tuned to the stations by rotating either of the lighthouses ☺! The volume control knob, in addition to controlling the volume, was connected to a colored disk that rotated when the volume control knob was turned. A light was positioned below so that the colored light was reflected onto the surface of the aquarium. Two lamps were located in the two front hollow columns of the cabinets that also illuminated the aquarium (the ship was also illuminated). This was an exceedingly complicated design that would have required a great deal of skill and many labor hours to construct. Unfortunately, there was also the matter of placing water near an electrical device.

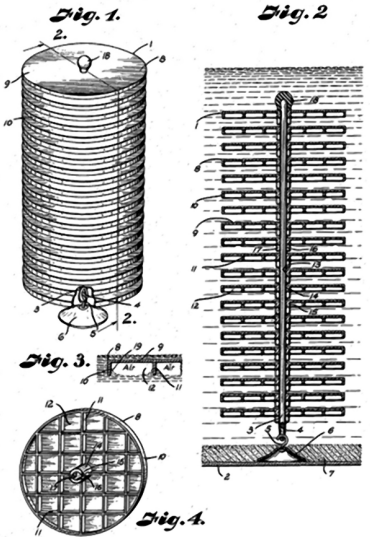


Figure 179-2824728. 1958: Herbert C. Crawford's aerator.

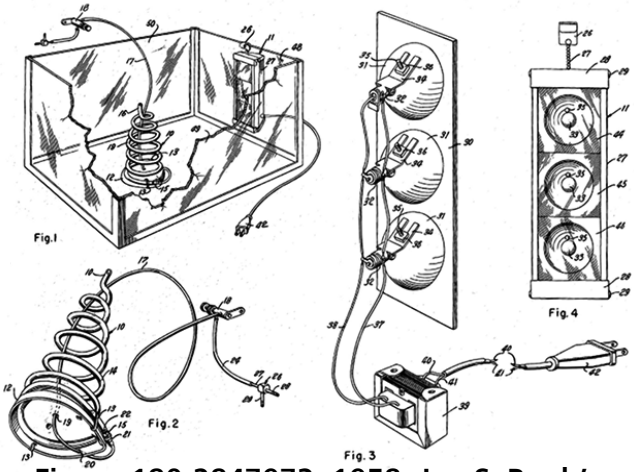


Figure 180-2847973. 1958: Joe S. Pugh's ornamental aerator and light show.

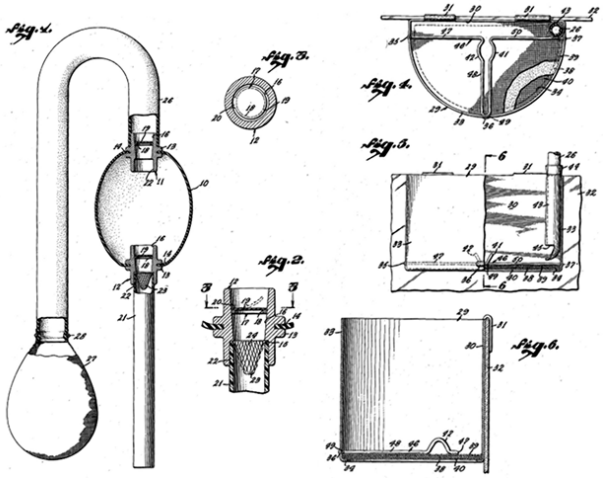


Figure 181-2672987. 1954: Clyde E. Hutchinson's cleaning device.

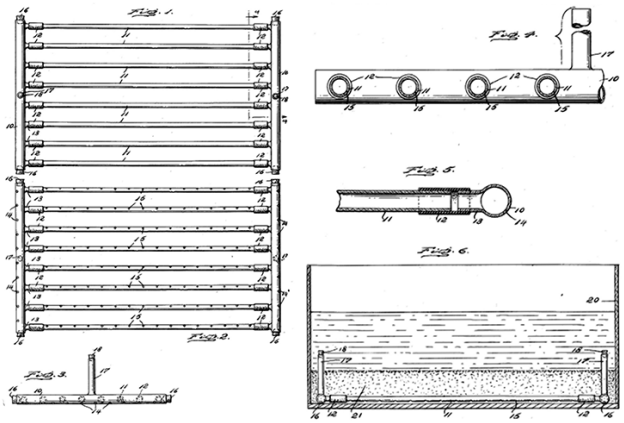
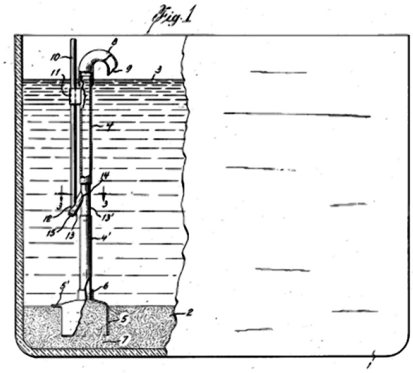


Figure 182-2595964. 1952: George W. Ludwick's undergravel filter.



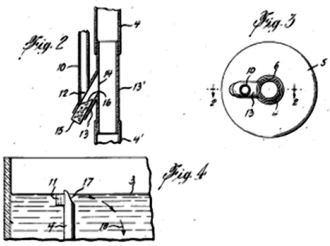


Figure 183-2614529. 1952: Thorwald H. Hanson's funnel-type undergravel filter.

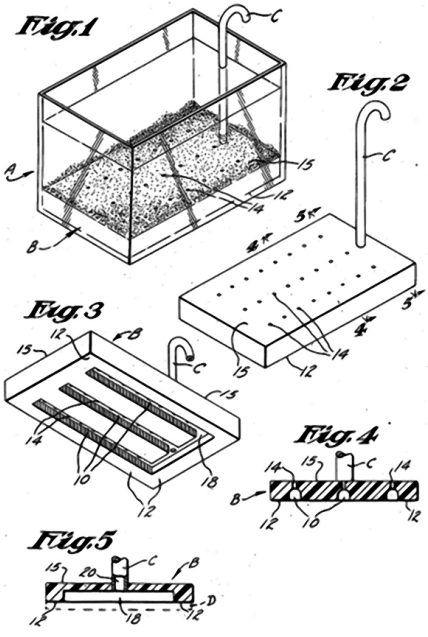


Figure 184-2636473. 1953: Albert J. Schwartz and Samuel H. Barbour's undergravel filter.

THE HOBBY IN HIGH GEAR ONCE AGAIN: THE DECADE OF 1949-1958

This decade, the last to be discussed in this book, saw the resurgence of the number of aquarium patents issued. Three involved aeration, although the one by Louis Feldman of New York City in 1949 (Figure 177-2491853) actually combined aeration, cleaning, and filtration. Feldman arranged the gravel in his aquarium in a cascading manner, using a series of partitions that held the substrate in tiers. By doing this, sediment collected at the front of the tank. Located at the front of the aquarium was a U-shaped apparatus, the front of which was perforated by a series of holes. Air was supplied to the device at 19 in the drawing, forming an air lift that drew water that contained the sediment from in front of the apparatus and transferred it to the filter located at the top of the tank at 16. Feldman's invention was an early form of simple multitasking.

In 1956 Howard R. Cleckner of Tipp City, Ohio was assigned a patent for the aeration device shown in Figure 178-2772867. Tap water entered at 26 on the right side of Fig. 1 in the diagram, drawing air with it from holes (30) in the conduit. On the left side is a discharge tube (36) with a hole in its top that prevented siphoning of the water when the level dropped below the lowest hold in the conduit. Cleckner's patent showed a number of variations on the design of the aerator that improved its efficiency, but the result was the same regardless of which variation was used. It is interesting to note that the inventor cited six previous patents that had a bearing on his design that involved absorbers, wash tanks, degassifiers, flush tanks, and bath sprays, attesting to the fact that many of our aquarium devices had their genesis in equipment that had nothing to do with the aquarium.

In 1958 Herbert C. Crawford created an aerator that required no air or water supply whatsoever (Figure 179-2824728). This strange device consisted of a number of round sections in layers that had pockets designed to hold air (Fig. 3 shows a detail of the pockets and Fig 4 shows a bottom view of one of the section members of the aerator). The aerator, made of aluminum, plastic, or stainless steel, was first gently lowered into the aquarium, trapping air in the pockets and then fastened at the bottom of the aquarium by a hook embedded in a suction cup. Over time, the oxygen would in theory dissolve into the water, leaving the nitrogen behind. After an interval (the inventor did not specify its length) the device was removed, releasing the depleted gas, and then reinserted into the aquarium for the process to begin anew. Although theoretically feasible, this is another Rube Goldberg device. Not only would the aerator be an eyesore in the tank, not enough oxygen would be absorbed into the water in any reasonable amount of time to make it worthwhile.

On the lighter side of aeration, Joe S. Pugh of Hamilton, Texas patented an ornamental aerator in 1958 that provided a color light show in the bargain (Figure 180-2847973). The aerator was constructed in a spiral shape with an entry for water located at point 2 in the diagram. The bubbles of air followed this merry path, and when the three colored lights located in a box at one end of the aquarium struck the spiral, it produced a riot of colors. The air bubbles at the surface of the water also acted as reflectors, thus enhancing the effect.

Clyde E. Hutchinson of Venice, California invented a cleaning device on 1954 that – variations thereof – are still used today (Figure 181-2672987). It was designed to manually remove the sediment from the bottom of an aquarium by sucking water up through a tube via a suction bulb (28) at the other end. Near the aquarium end of the tube was a large bulb (10) that contained a check valve to prevent large particles – such as gravel – from entering the device and clogging it. The outlet portion contained a filter that prevented sediment from passing through. The dirty water collected in bulb 10 where it could be discarded or else put through the strainer shown in Fig. 4 to return clean water to the tank. It was a very simple device, but effective.

Figure 182-2595965 shows the tube-type undergravel filter that was invented by George W. Ludwick of Philadelphia, Pa. in 1952. The vertical tube was normally capped, but at intervals a hose was attached and the water within the tubes was si-

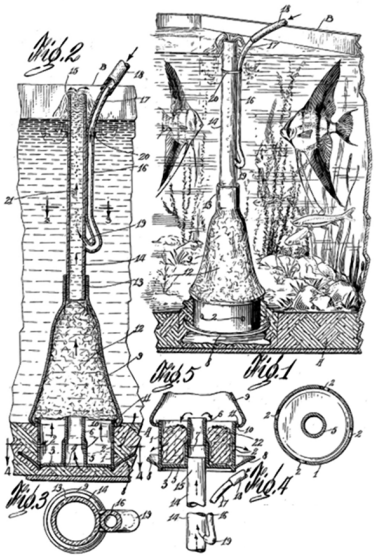


Figure 185-2674574, 1954: Constant Pettas' funnel filter design.

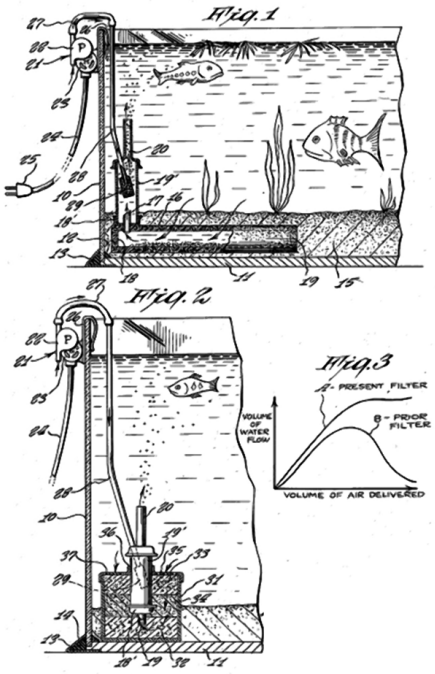


Figure 186-2676921, 1954: Mary L. Vansteenkiste's porous filter design.

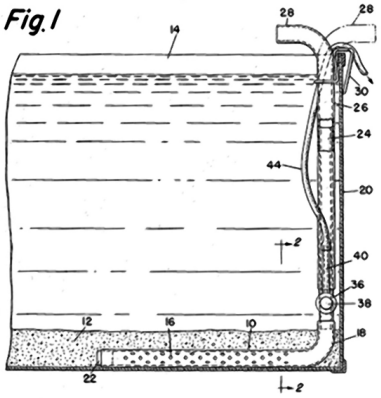
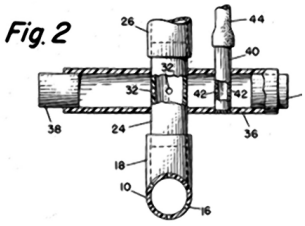


Figure 187-2730496, 1956: Joseph L. Zavod's undergravel filter.



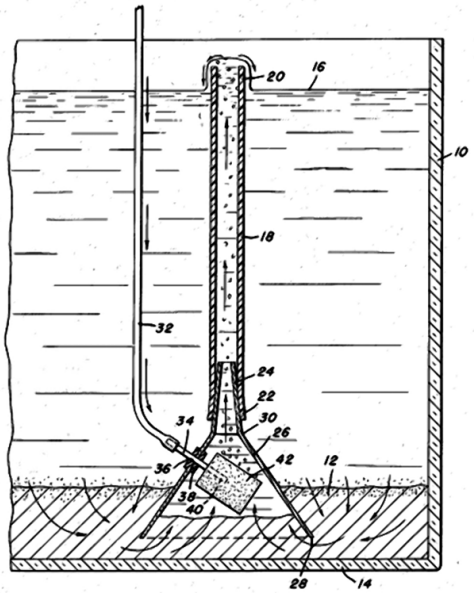


Figure 188-2744065, 1956: Joseph S. Lacey's funnel filter design.

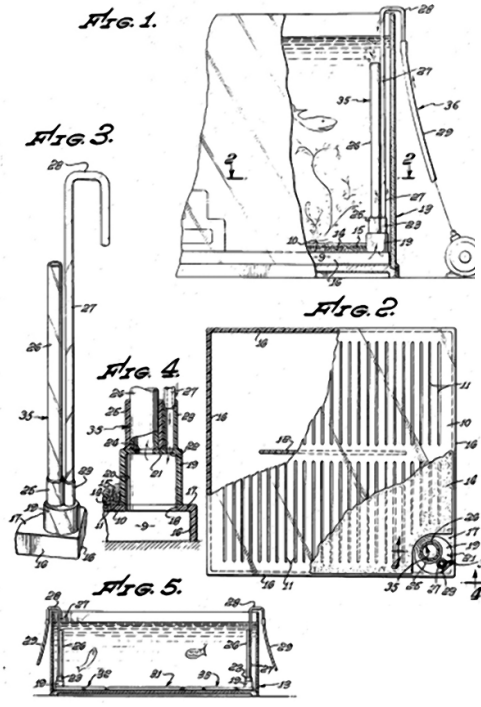


Figure 189-2748075, 1956: Norman G. Hovlid's undergravel filter.

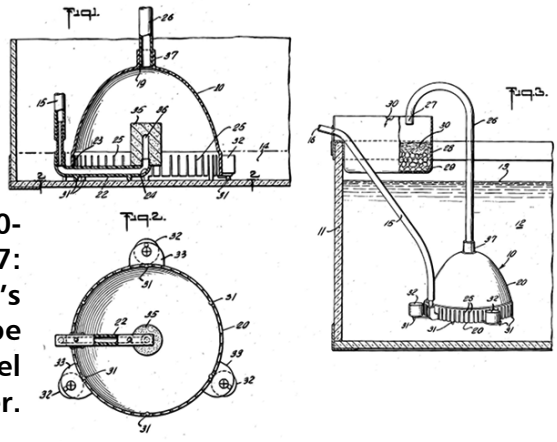


Figure 190-2786026, 1957: Ludwig Stark's funnel-type undergravel filter.

phoned off. Again, close but no cigar. If Ludwick had incorporated air into the siphon tube, converting it into a vertical air/water return tube, we could credit him as being the first to invent the undergravel filter. Apparently Ludwick was not familiar with the concept of the airlift that had been used in aquariums for many years prior to his invention.

An early variation on this idea was patented later in 1952 by Thorwald H. Hanson of Rahway, New Jersey and became the inspiration for the funnel type of undergravel filter (Figure 183-2614529). In this design, a cylinder (in later designs this was more funnel-shaped), open at the bottom, was pressed down into the gravel, its upper end connected to an airlift. Like the funnel designs, it did not pull water through all parts of the gravel layer throughout the tank and so was ineffectual.

The filter devised in 1953 by Albert J. Schwartz and Samuel H. Barbour of Philadelphia is shown in Figure 184-2636473. It consisted of a solid plate with three channels drilled into it, a number of holes being drilled through each of the tops of the channels, all three emptying into a common channel at one end. The curved siphon tube shown was used to draw the water from the tank into a standard filter (not pictured) and returned to the aquarium. If Schwartz and Barbour had incorporated air into the siphon tube, converting it into a vertical air/water return tube, we could credit them as being the first to invent the flat-bottomed undergravel filter. Again, close but no cigar ☺!

Another funnel filter design appeared in 1954, that by Constant Pettas of Montreal, Canada (Figure 185-2674574. It was designed to fit in the corner of the tank, although it was also designed as a sediment collector as well. Unlike Hanson's design, the funnel could also be packed with a filter material such as fiberglass. Because they did not pull water throughout all parts of the gravel, these funnel designs were not a success.

Mary L. Vansteenkiste, of Montgeron, France, invented the filter in 1954 shown in Figure 186-2674574. It was essentially a hollow porous cylinder, embedded with carbon, so when the water passed through the gravel, impurities not removed by the gravel were adsorbed when the water passed through the cylinder. Along with her husband, Vansteenkiste later modified this design and it was advertised and sold in this country during the 1960s and 1970s as the "Invisible French Filter & Aerator." Since it merely involved inserting a cylinder, it could be installed and uninstalled without taking down the tank.

A design that was patented by Joseph L. Zavod in 1956 (Figure 187-2730496) utilized a perforated tube below the gravel. It had a vertical air/water return tube that could be elongated or shortened via a sleeve that surrounded one portion of it. It had cleanout plugs at various strategic places, although these could be used only when the filter was taken out of the aquarium. The lower part of the diagram shows the specially designed air chamber that allowed a greater volume of air to be introduced, thus increasing the air/water flow through the outlet tube. The return spout could be rotated so that the water drawn from the gravel could be removed from the tank

Figure 188-2744065 shows a design patented in 1956 by Joseph S. Lacey of Upper Darby, Pennsylvania. It consisted of a funnel set into the gravel with a vertical air/water return tube attached to the narrow end, along with an ordinary air stone in the main part of the funnel. The problem with all of these funnel designs, of course, is that the water was pulled only through the gravel near the funnel.

The earliest design for a slotted-box undergravel filter – this one did use an airlift-is shown in Figure 189-2748075. It was invented in 1956 by Norman G. Hovlid of Long Beach, California and was subsequently manufactured by the Miracle Filter Company of Long Beach, California. It was a commercial success and Hovlid can be considered as the first to invent a true undergravel filter, although other types of undergravel filter designs would follow in subsequent decades.

The last of the undergravel filter designs of this decade was a variation of the funnel type, patented in 1957 by Ludwig Stark of Springfield, New Jersey. Stark's filter (Figure 190-2786026) consisted of a hollow casing shaped like a bell, the bottom of which

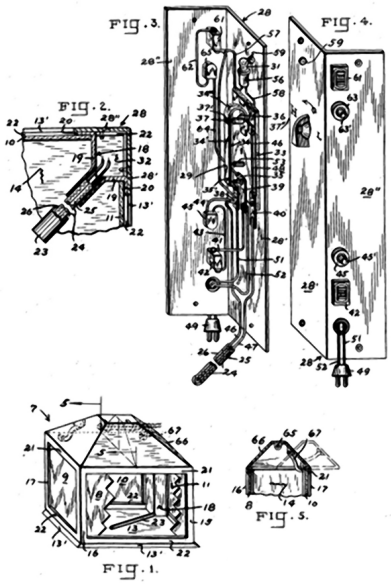


Figure 191-2566990.
1951: Andrew Mahle's integral heating design.

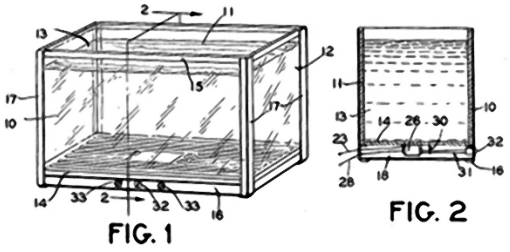
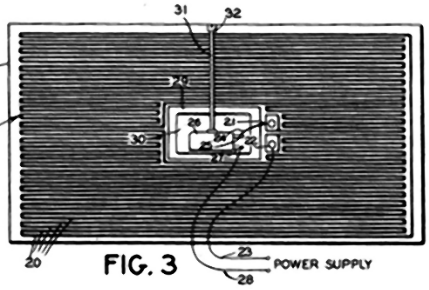


Figure 192-2805313.
1957: Charles J. Lumb, Jr.'s under-tank heating design.



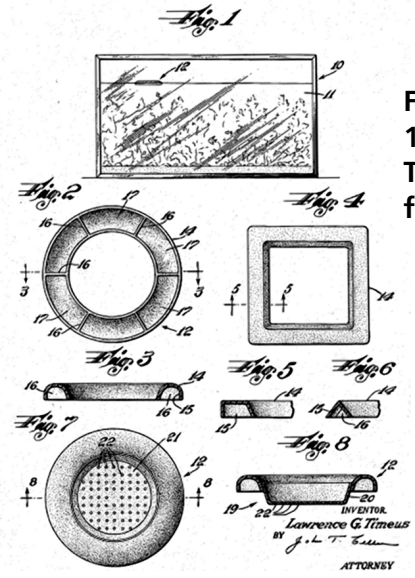


Figure 193-2711714.
1955: Lawrence G. Timeus' floating ring feeder.

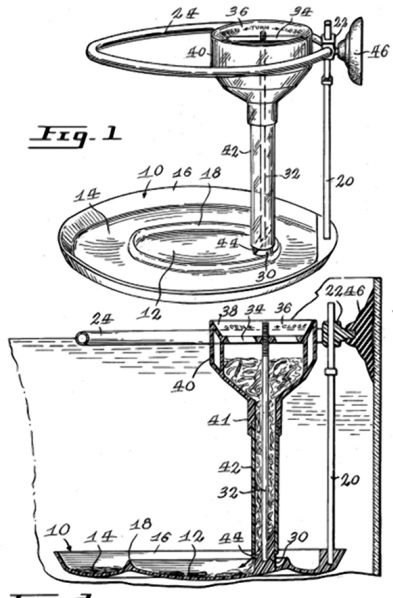


Figure 194-2718211.
1955: Constant G. Funnel-fed Pettas's ledge feeder.

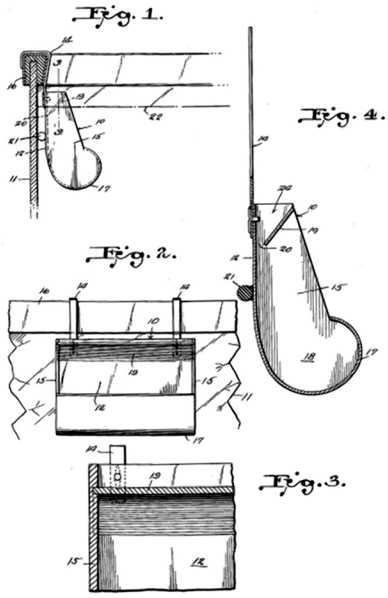
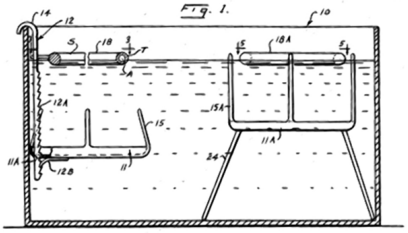


Figure 195-2727489.
1955: Melvin Sklar's submerged trough feeder.



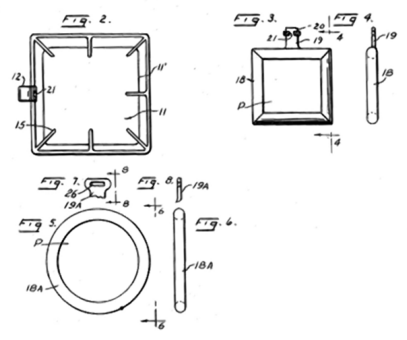


Figure 196-2754800.
1956: Morris R. Gare's floating ring and ledge feeder.

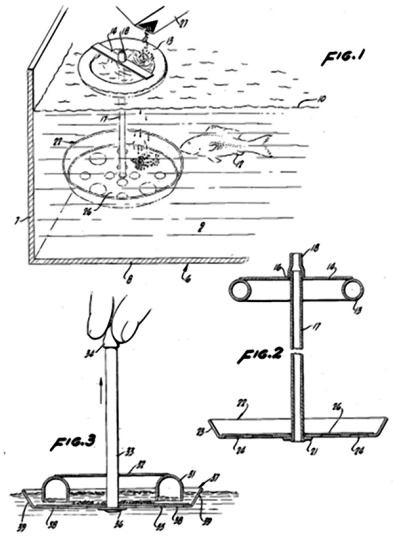


Figure 197– 2761422. 1956: Frank H. Martin's floating ring and submerged ledge feeder.

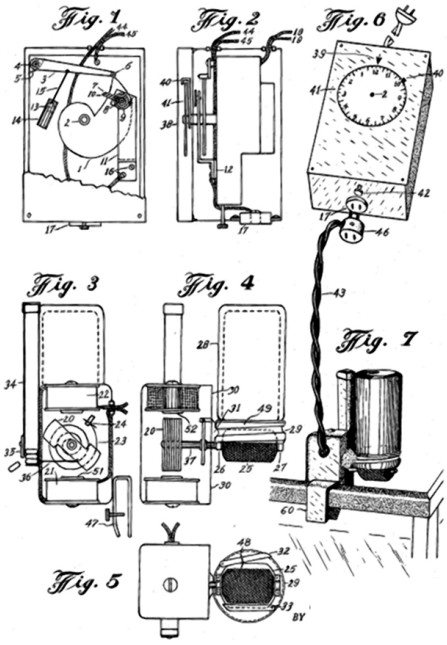
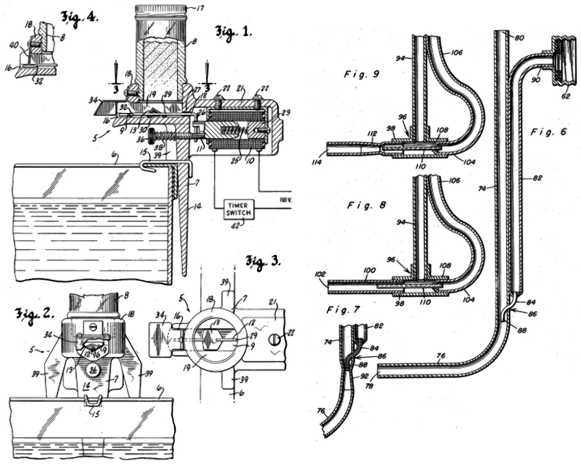


Figure 198– 2725852. 1955: Clarence H. Cramer's hopper-type automatic feeder.

Figure 199– 2772659. 1956: Francis H. Tennis' hopper-type automatic feeder.



was embedded in the gravel. It was weighted so it would not rise to the surface. There were slots in the embedded part that allowed water to flow into the bell through the surrounding gravel. Air was pumped into the bell, bringing the water up through the gravel and to the top of the bell and ultimately out into a filter box hung at one corner of the tank.

Two inventions that concerned heating appeared during this decade. The first was awarded to Andrew Mahle of Oakland, California in 1951 (Figure 191-2566990). This apparatus was designed to be an integral part of the aquarium but the inventor provided no details of the materials used or the methods for sealing the unit. Presumably everything except the glass panels for the aquarium was made of metal and I can only further presume that the material used was resisted to water, such as stainless steel. In any event, for safety's sake it is much better to have any submersible heater/thermostat combination as a separate, stand-alone device, since then and only then can it be made in such a manner as to tolerate prolonged immersion in the water. The invention of Charles J. Lumb, Jr. of Milford, New Jersey in 1957 did separate the heating elements from the tank, since a coil the size of the entire bottom of the tank was located underneath the aquarium (Figure 192-2805313). These designs were expensive and clumsy, however, compared to the cheap test tube types that had been available for many years prior to this.

A plethora of feeding schemes characterized this period and they varied from the simple to the complex. The simple designs included that of Lawrence G. Timeus of New York City in 1955 (ring-type floating feeders–Figure 193-2711714), Constant G. Pettas of Montreal, Canada in 1955 (submerged ledge feeder–Figure 194-2718211), Melvin Sklar of East Rockaway, New York in 1955 (a submerged trough feeder–Figure 195-2727489), Morris R. Gare of Hillside, New Jersey in 1956 (floating ring combined with a submerged platform to catch uneaten food–Figure 196-2754800), and Frank H. Martin of San Francisco, California in 1956 (floating ring and a submerged platform to catch uneaten food–Figure 197-2761422). These designs were all aimed at keeping the fish food from floating all over the tank.

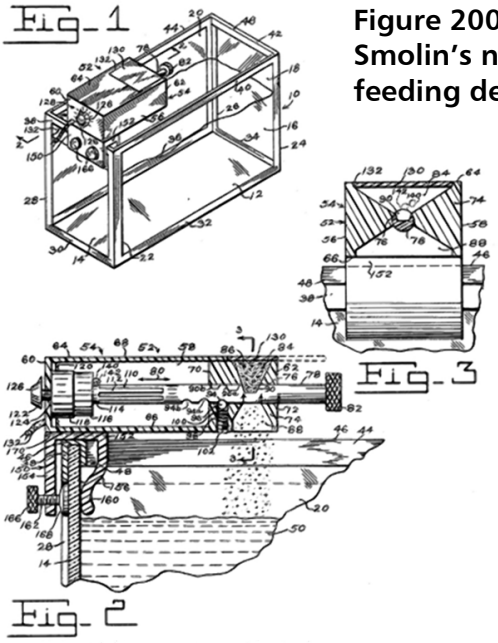
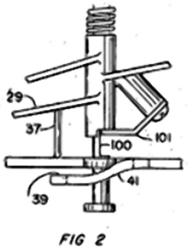


Figure 200-2785831. 1957: Seymour Smolin's notched shaft automatic feeding device.



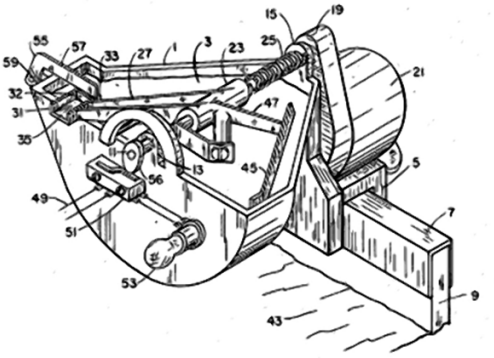


Figure 201-2808808. 1957: Edward C. Roben's scoop-hopper type feeder.

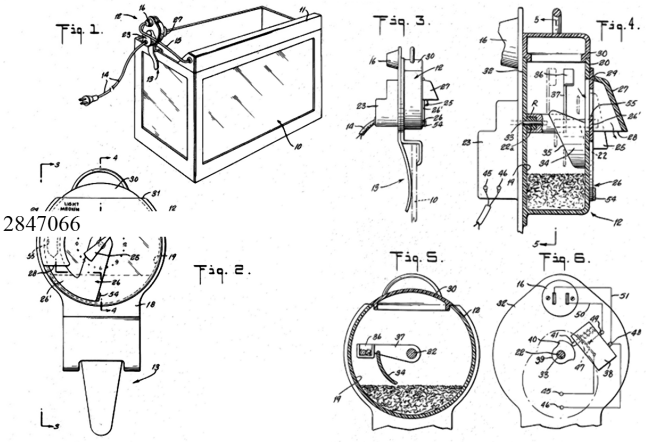


Figure 202-2847066. 1958: Joseph P. Kleiber and Odif Podell's rotating cup feeder.

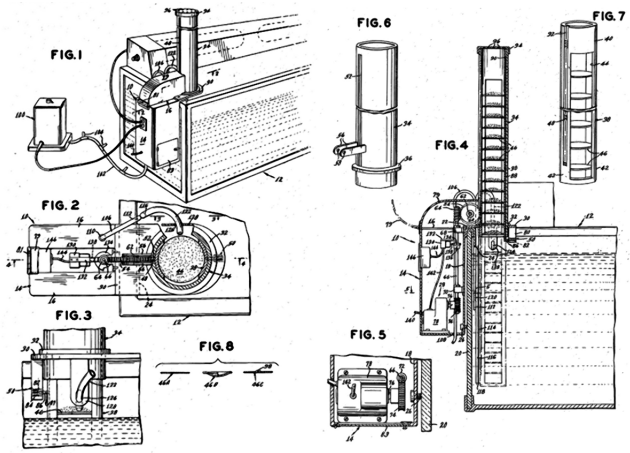


Figure 203-2858799. 1958: Alexander and Randolf Kraus' ratcheting tower feeder design.

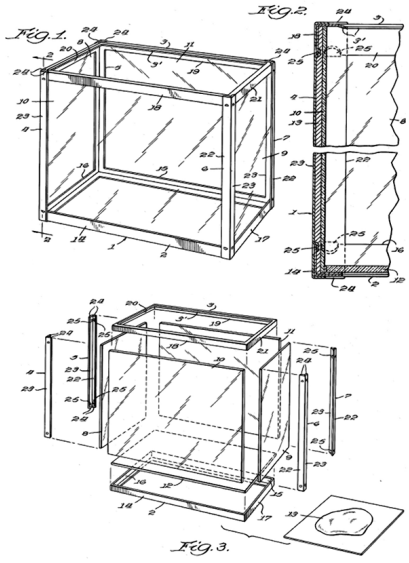


Figure 204-2713847. 1955: Richard H. Blaise's aquarium kit.

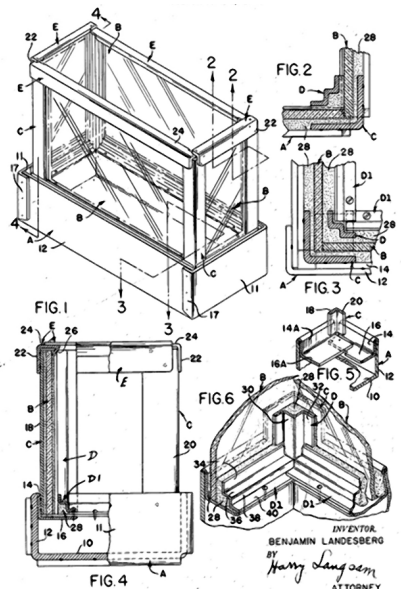


Figure 205-2787981. 1957: Benjamin Landesberg's heating, aeration and filtration concealment design.

The more complex designs were mechanical devices designed to feed the fish over a period of time when the aquarist was not available. The device patented in 1955 by Clarence H. Cramer of Toledo, Ohio featured a cylindrical hopper mounted on the side of the aquarium (Figure 198-2725852). The food was released by a valve at controlled intervals via a clockwork mechanism. The device patented by Francis H. Tennis in 1956 also utilized a hopper mounted on the top frame of the tank and varied from the Cramer design mainly in the nature of the food release mechanism (Figure 199-2772659).

In a design patented by Seymour Smolin of New York City in 1957, a housing containing the apparatus was fastened at the frame at one end of the aquarium (Figure 200 -2785831). The upper portion of the housing block (74 in the diagram) was hollowed out for the food (Fig. 3) and the shaft had a notch in it to receive food when it was in the up position. When it was rotated to the down position, the food fell out at position 88 in the diagram. The rotor also had recesses at other positions to provide for a smaller quantity of food to be released for smaller or a fewer number of fishes. The motor (116) and control box (118) were located within the housing and were small.

The creation of Edward C. Roben was patented in 1957 had a hopper with a scoop (31 in the diagram) rotating at a constant rate of one or two revolutions per day (Figure 201-2808808). The scoop picked up the food as it rotated. A sleeve pushed the scoop arm out from the hopper and after it reached its highest point, would drop suddenly, striking the side of the hopper where the food would be discharged into the aquarium. The sleeve would retract the scoop and then continue on to its next rotation.

The device invented by Joseph P. Kleiber and Odif Podell of Pleasantville, New York in 1958 was quite simple (Figure 202-2847066), consisting of a round container containing a dispensing cup (36 in Fig. 5 in the diagram). As the dispensing cup rotated, it filled with food. When it got to the feeding spout (28 in Fig. 4), a spring abruptly snapped it sideways, throwing the food into the spout and dropping it into the aquarium.

The design of Alexander and Randolf Kraus of New York City in 1958 was a real Rube Goldberg (Figure 203-2858799). The design consisted of a tower containing a removable inner cylinder open on one side containing a number trays containing the food. A motor run by a timing mechanism dropped the tower near the water surface where the food was blown into the water by an air pump that was part of the design. When all of the trays had been lowered into the water, the inner cylinder was removed and dried, and the food was replaced. Although the device also could control the timing of the aquarium lights – a nice touch – all in all it was a featherbrained idea.

Because of their expense, automatic feeders are not an option when a large number of tanks are involved. When one thinks about it, one is perfectly safe in leaving one's fishes unattended for a week or even two, and if push comes to shove a far simpler solution is just to have a friend or family member stop by every three or four days to feed your fish (if they know nothing about feeding fish, you can prepare servings in small packages prepared ahead of time). Fortunately, today's automatic designs are simpler and more reliable, so for the aquarists who have only a few tanks, they may be a reasonable option.

In 1955, Richard H. Blaise of Glendale California patented an aquarium that came in the form of a kit, the frame being packaged in a knockdown form (Figure 204-2713847). Blaise cited the fact that the smaller sized aquariums were heavy and therefore costly to transport, and that the danger of the glass breaking during shipment was great. His idea was to manufacture a frame that the aquarist could put together readily and then glaze it himself with glass purchased locally. The frame was of an interlocking type so that no bolts or other fasteners were needed. The package came with aquarium cement – the aquarist didn't have to purchase it. This was a well-thought out idea, but the fact was that the already pre-built smaller aquariums available in stores were cheap enough to overcome the presumed cost advantage.

Two patents were awarded during this year that featured cosmetic improvements on aquarium design.

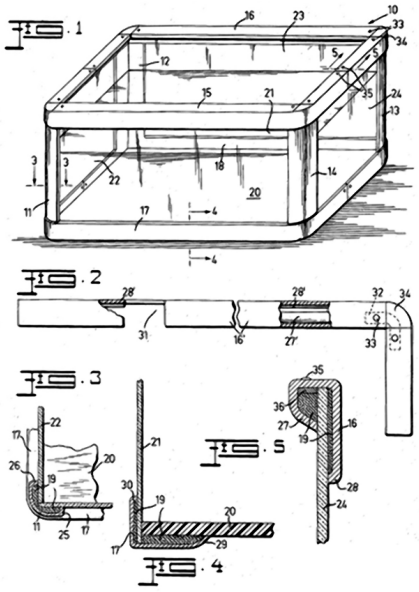


Figure 206-2792811. 1957: Joseph Di Chiaro's rounded corner design.

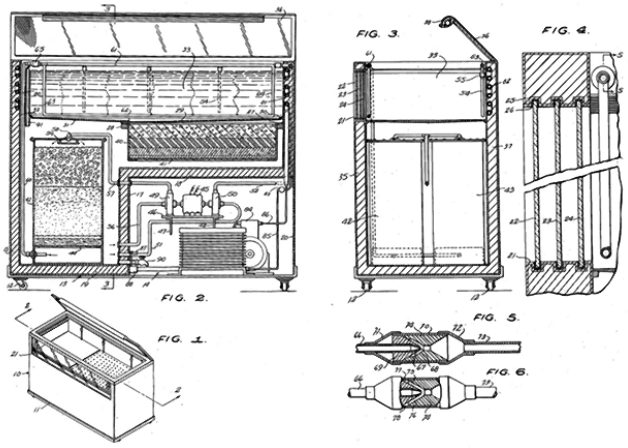


Figure 207-2594474. 1952: Lewis J. McGrath's refrigerated aquarium.

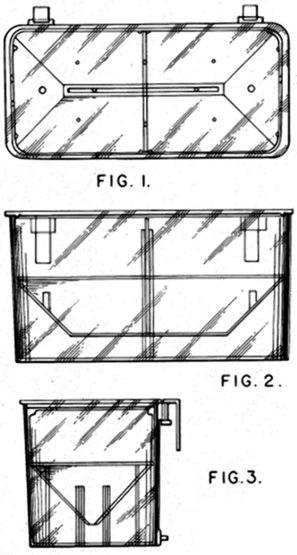


Figure 208-D171472. 1954: Harding W. Willinger and Herbert N. Nestler's breeding trap.

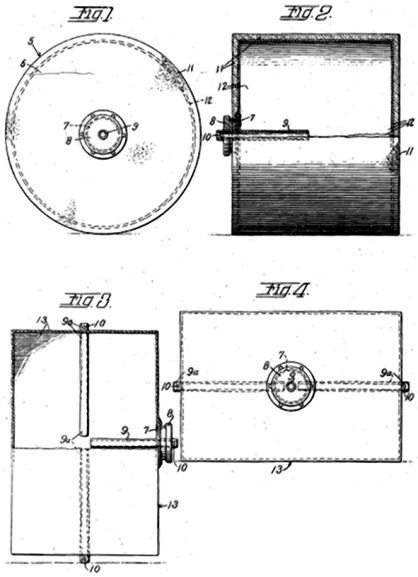


Figure 209-2476704. 1949: Jay E. Cook's shipping can.

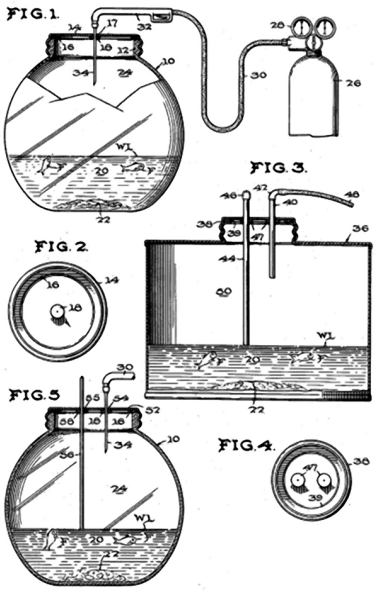


Figure 210-2783736. 1957: George N. Washburn's oxygen-fed shipping can with antibiotics and zeolite added.

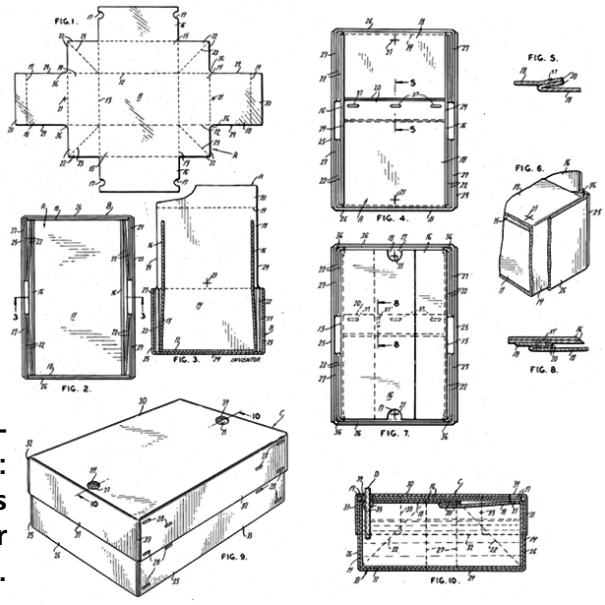


Figure 211-2763239. 1956: Warren C. Rendall's waxed paper shipping container.

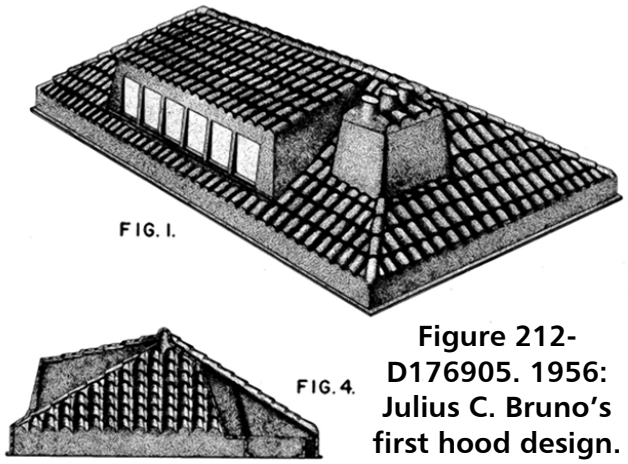


Figure 212-D176905. 1956: Julius C. Bruno's first hood design.

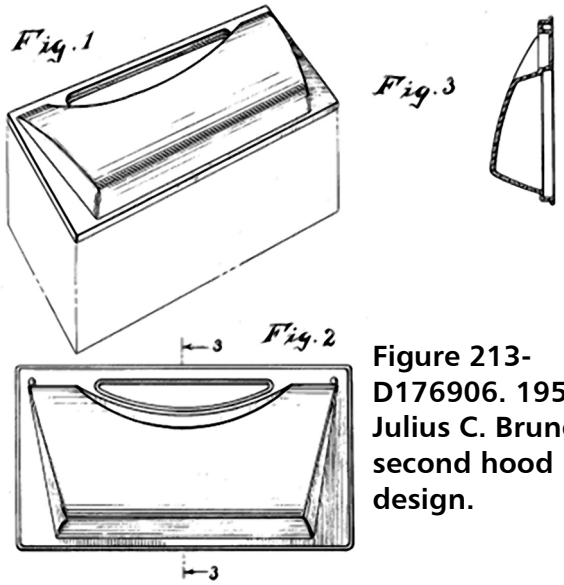


Figure 213-D176906. 1956: Julius C. Bruno's second hood design.

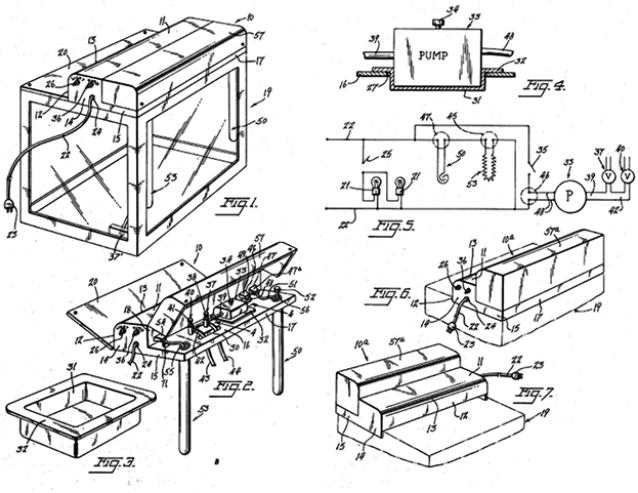


Figure 214-2776642. 1957: Joseph M. Sepersky's hood design that concealed lighting and aeration equipment.

Benjamin Landesberg of Philadelphia was issued a patent for a marine aquarium that incorporated a panel at the bottom to conceal the obtrusive filtering apparatus typical of the marine aquaria of the day (Figure 206-2787981). In the same year, Joseph Di Chiaro of New York City designed an aquarium in 1957 whose frame had rounded corners, giving it a decided different and rather modern appearance (Figure 205-2792811). Finally, in 1952 a refrigerated display tank patent for marine fish was assigned to Lewis J. McGrath of Newtonville, Maine (Figure 207-2594474). In addition to the refrigeration unit concealed below, provision was also made for filtration and aeration.

That well-known inventor of aquarium equipment and co-owner of Metaframe, Harding W. Willinger, along with his co-inventor Herbert N. Nestler, both of New York City, patented a breeding trap in 1954 (Figure 208-D171472) that was a bit more modern in appearance than prior breeding traps. As this was a design patent, the drawing tells all.

Three patents for transporting fish were issued during this decade. The first one was awarded to Jay E. Cook of Baltimore, Maryland (Figure 209-2476704) in 1949. This design (two configurations were shown: a cylinder and a box shape) differed considerably from previous can designs in that the water level would always be below the air inlet no matter what the position of the container was. Water, therefore, never could escape from the container and damage nearby packages. Another metal can patent was awarded in 1957 to George N. Washburn of Stoutland, Missouri (Figure 210-2783736). In addition to the usual container that supplied oxygen to the can, the invention also specified the use of activated carbon to remove impurities, an antibiotic compound, and, 'Permutit," a synthetic resinous compound (a zeolite) that assisted in ammonia removal.

The patent awarded to Warren C. Rendall of San Francisco in 1956 (Figure 211-2763239) was a variation on the waxed, folded Chinese food take-out box we all know so well (and which also resembled the paper containers used in the early days when fish were sold). This design was of a far sturdier construction, however, and meant to replace the tradi-

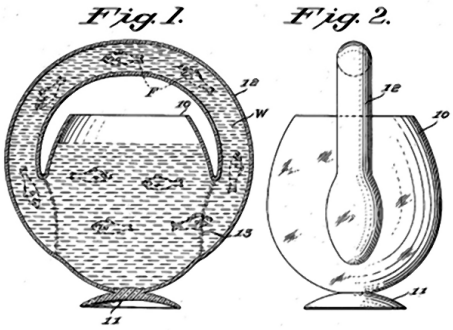
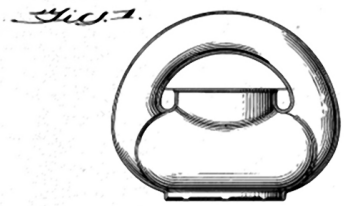


Figure 215-2512678.
1950: Earl A. Rice's first hollow handle fish globe design.



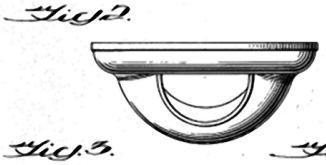
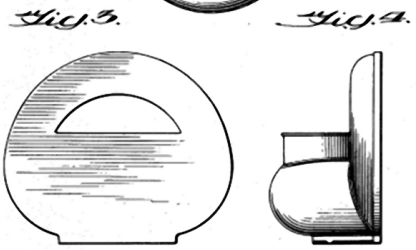
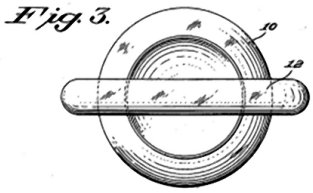


Figure 216-D160125.
1950: Earl A. Rice's second hollow handle fish globe design.





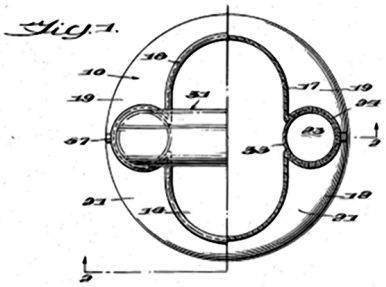
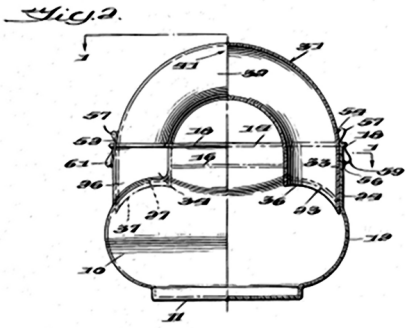


Figure 217-2646021.
1953: Earl A. Rice's third hollow handle fish globe design.



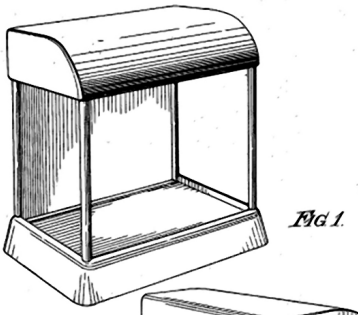
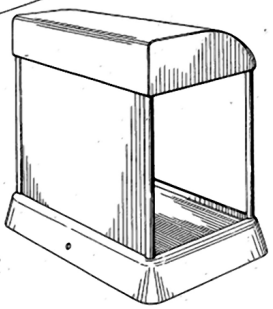


Figure 218-D158074.
1950: Roy E. Hollick-Smith's modern tank with hood.



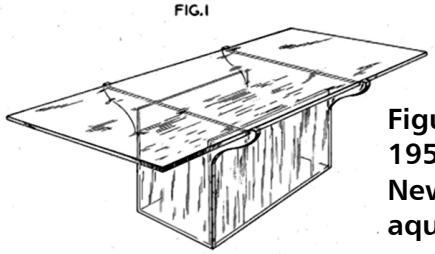
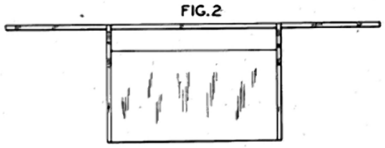
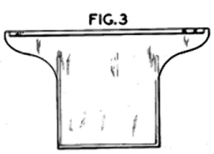
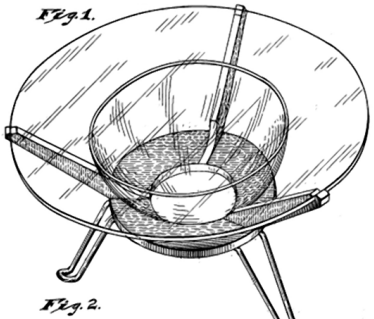


Figure 219-D159661.
1950: Lucille G. Newcome's table aquarium.







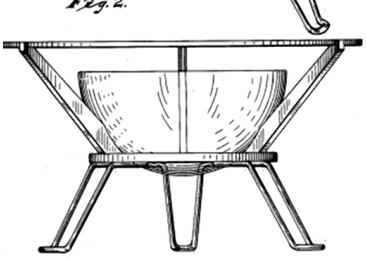


Figure 220-D172706.
1955: Hugh J. Davey and Robert O. Bextel's table aquarium.

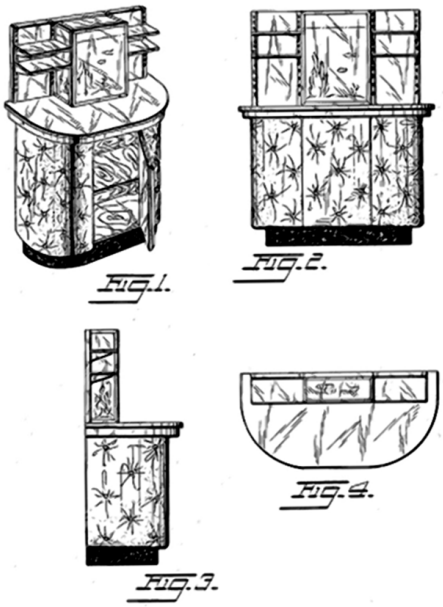


Figure 221-D152456. 1949: Mac Buxbaum and Moe Lebensfeld's bar aquarium.

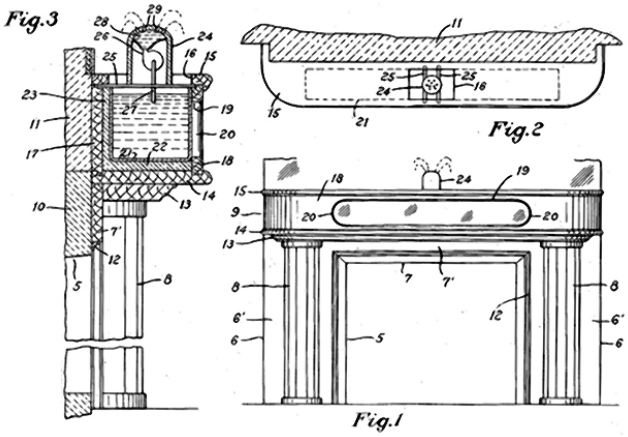


Figure 222-2503945. 1950: Alice J. Grossniklaus's fireplace mantle aquarium.

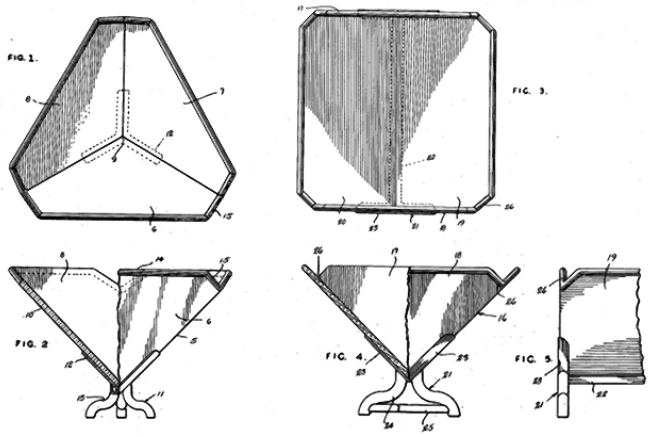


Figure 223-2494937. 1950: Aaron Gandy's triangular aquarium.

tional metal cans commonly used at the time for larger shipments of fish.

Three aquarium hood designs were patented during this period. The first two were design patents created by Julius C. Bruno of Newark, New Jersey in 1956 (Figure 212-D176905 and Figure 213-D176906). The former resembled the roof of a house, and the latter was a very rounded and modern-looking design. The third patent, issued to Joseph M. Sepersky in 1957 (Figure 214-2776642) showed an aquarium hood that concealed the heating, lighting, and aeration equipment. This was the forerunner of the "Eclipse" type of hood sold today that added filtration to the equipment under the hood.

Designs for aquariums abounded in this decade, including three by Earl A. Rice of Mereesburg, Pennsylvania that consisted of a fish globe with a hollow handle the fish could swim through, the first two in 1950 (Figure 215-2512678 and Figure 216-D160125) and the third in 1953 (Figure 217-2646021). A very modern tank design featuring rounded edges was patented in 1950 by Roy E. Hollick-Smith of London, England (Figure 218-D158074).

There were two table aquariums patented in this decade, the first by Lucille G. Newcome of Minneapolis, Minnesota in 1950 (a rectangular shape–Figure 219-D159661), and the other by Hugh J. Davey and Robert O. Bextel of Frankfort, Indiana in 1954 (an inverted dome shape–Figure 220-D172706).

There were also many novel aquarium designs, including one by Mac Buxbaum and Moe Lebensfeld of Flushing, New York in 1950 (Figure 221: D152456) for a combination aquarium and bar that was very appealing, although the possible breakage due to the close proximity of the front of the aquarium to the usual glassware and bottle paraphernalia of a bar suggests that Mac and Moe had a few samples from their own bar as they were designing it ☺! Alice J. Grossniklaus of Wilmot, Ohio incorporated an aquarium in 1950 into a mantle over a fireplace, complete with a fountain for aeration and increasing the humidity during the winter (Figure 222: 2503945). Grossniklaus allowed for the heat of the

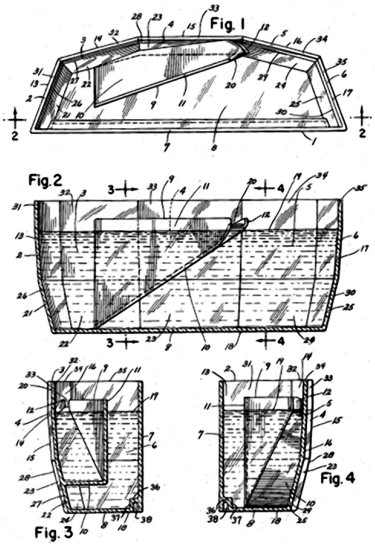


Figure 224-2808024. 1957: Arthur R. Glidden's multifaceted tank design.

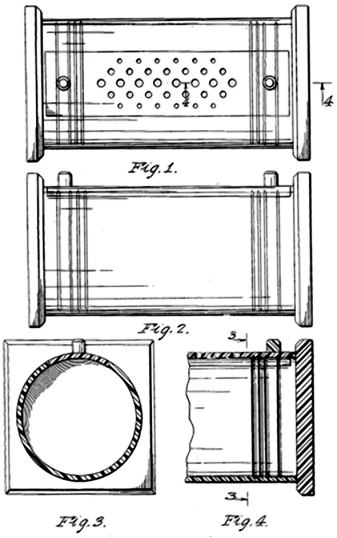


Figure 225-D168582. 1953: Francis J. McMorrow's Horizontal cylinder tank design.

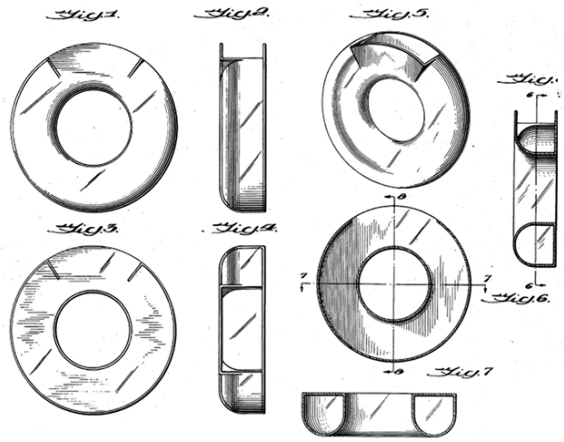


Figure 226-D169866. 1954: Karl A. Rice's doughnut tank design.

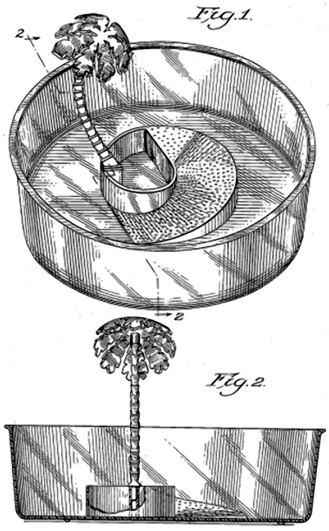


Figure 227-D167243. 1952: Bernard Yellin's palm tree tank design.

Figure 228-2844912. 1958: John A. Sebesta's flailing arm octopus aerator.

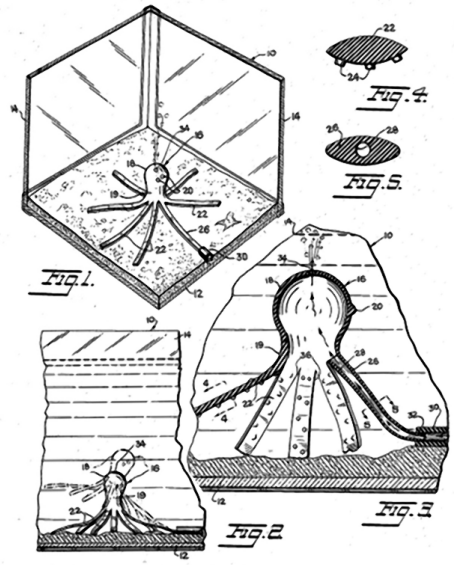
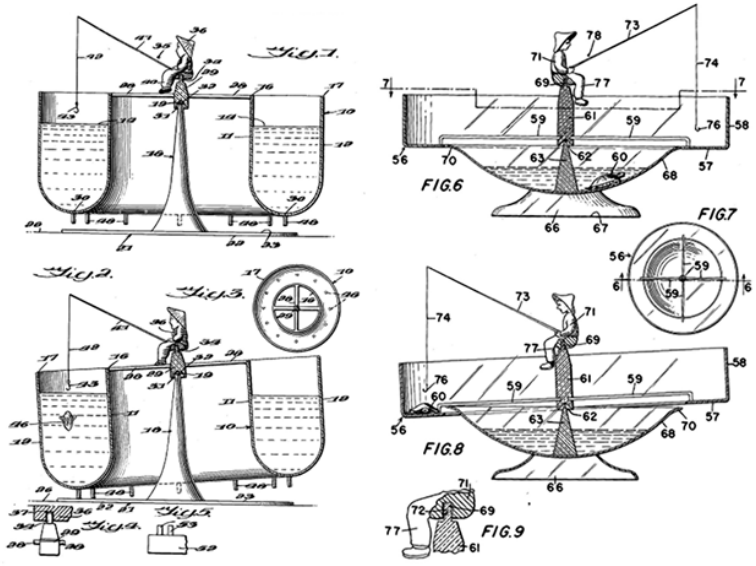


Figure 229-2720724. 1955: Earl A. Rice's pivoting aquarium.



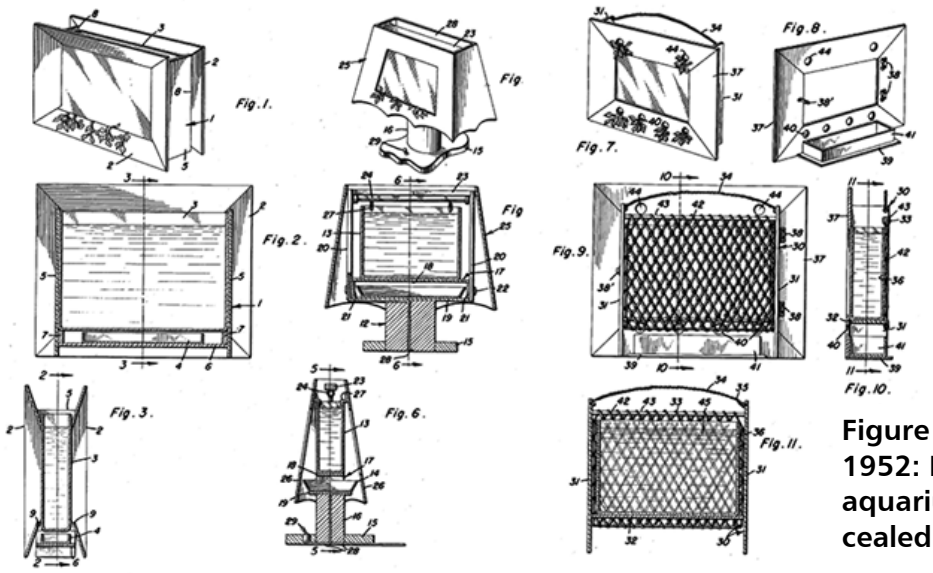


Figure 230-2595085. 1952: Fred Kuriyama's aquariums with concealed flower pots.

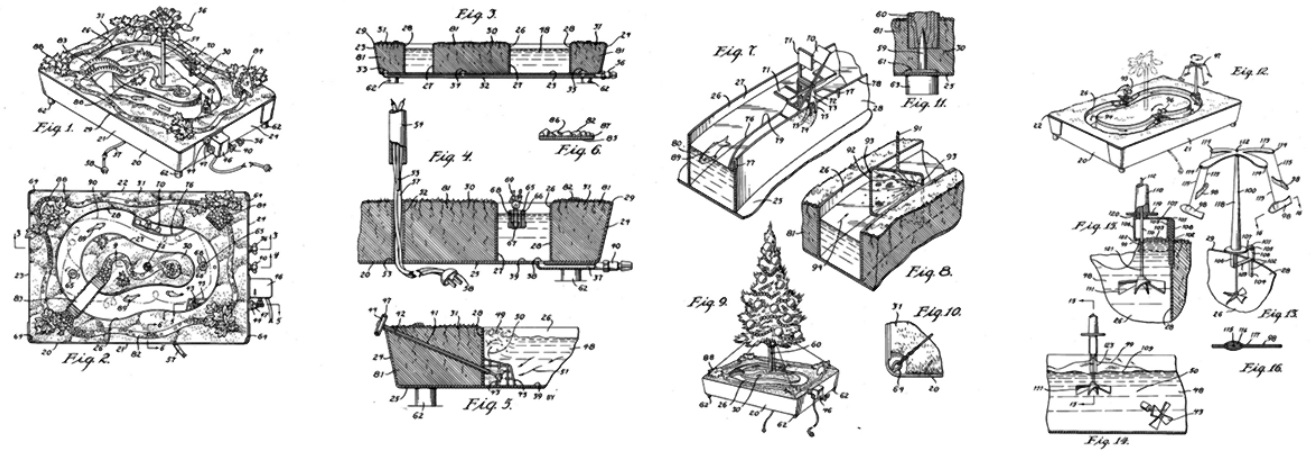


Figure 231-2751880. 1956: Adam M. Markowski's animated display and built-in aquarium.

fireplace by insulating the bottom with a layer of rock wool.

An interesting design was that created by Aaron Gandy of Seymour, Texas in 1950. There were two modifications of the horizontal cross-section – triangular and rectangular – but the main idea was the triangular vertical cross-section of both (Figure 223-2494937), the sloping walls producing a rainbow effect whenever sunlight fell onto the aquarium. The design also magnified the apparent number of fish in the aquarium. Arthur R. Glidden of Seattle, Washington in 1957 also achieved this effect by incorporating a multiplicity of sides in the aquarium, some of which were coated with a reflective material (Figure 224-2808024). Glidden also provided a "fish jump", number 9 shown in the diagram, consisting of a channel-like structure which extended from below the water level to a diving edge elevated somewhat above such level from which the fish could leap into the water (Glidden could have saved himself the trouble just by putting some *Rivulus* – the all-time aquarium champion jumpers-in the tank ☺!).

Two unusually-shaped aquarium designs were patented in 1953, one by Francis J. McMorrow of Stamford, Connecticut (a cylinder–Figure 225-D168582) and the other by Karl A. Rice of Mercersburg, Pennsylvania (a doughnut–Figure 226-

D169866). Novelty aquaria were patented in 1952 by Bernard Yellin of Chicago (a round, flat aquarium containing a palm tree emerging from the center– Figure 227-D167243), and by John A. Sebesta of Long Island City, New York in 1958 (an octopus – Figure 228-2844912). Sebesta's octopus was an aerator whose arms flailed about as air was pumped into it. Another novelty aquarium was patented by Earl A. Rice in 1955 (he was a busy man in that decade!) that consisted of a round fish bowl balanced on a central pivot (Figure 229-2720724). It was fitted with a model of a fisherman holding a fishing pole and line (the variation shown was designed for a turtle tank). This is probably the silliest patent described in this book. The device was supposed to tilt in response to the weight of a fish, but had the aquarium ever been built it would have been discovered that achieving the perfect balance necessary for it to operate would be very difficult indeed. Inventions like these, along with the infamous "burping clam," were apparently designed for those aquarists who also delighted in supplying their bathrooms with toilet paper printed with bar room humor on the sheets ☺!

A more meaningful and really imaginative design was one patented in 1952 by Fred Kuriyama of Waianae, Hawaii. In Kuriyama's designs (two modifications were described) the aquarium was attractively framed, with a plant box located underneath (Figure 230-2595085). The idea was to grow vines or other plants of a similar creeping nature so that the leaves hung on the outside of the aquarium. The plant box was not seen since it was concealed within the framing. The only weakness of these designs was that the aquarium and its frame had to be lifted to gain access to the plant box. Thus, the tanks had to be small and were the reason why Kuriyama chose a very narrow design for his aquariums.

Our last aquarium patent is both eccentric and extravagant. This is the animated display aquarium patented in 1956 by Adam M. Markowski of Philadelphia (Figure 231-2751880). The inventor even suggested (Fig. 2 in the diagram) using it as the base for a Christmas tree ☺! The device consisted of an oval waterway for the fish, submerged in a miniature terrain similar to that used by model railroad enthusiasts, and complete with miniature plants (they could be real or artificial), a lighted tree, and a bridge. A motor-driven propeller with a cage around it protect the fish (Fig 5 in the diagram) produced a current within the waterway that provide both motion and aeration. A decorative float that moved with the flow of water could be placed in the waterway, as well as a horizontal water wheel (one with fish figures that fly outward is shown in Fig. 12 and Fig. 13). However, the fish would have been difficult to have been seen in this contraption and, in any case, would have been unnoticed among all of the other action going on around them.

CONCLUSION

Although we poke a great deal of fun at the Rube Goldberg designs, some were ahead of their day, and others showed considerable imagination. In 1785 William Cowper observed, "Thus first necessity invented stools, convenience next suggested elbow-chairs, and luxury the accomplished sofa at last." Thus has it been in the history of aquarium inventions.

It should be noted that there is a subtle difference between invention and innovation. Innovation is the process of converting knowledge and ideas into better ways of doing things. An essential element for innovation is its application in a commercially successful way. Invention, on the other hand, is about creating something completely new. There are several differences between innovations and inventions. An invention can lead to an innovation, but many inventions are often created and then placed on a shelf. In fact, most of the patents discussed in this book never saw the light of day. On the other hand, many aquarium innovations have been introduced but never patented. In spite of these differences, aquarists owe a great debt to these imaginative pioneers, be they inventors or innovators.

The First Heated Aquarium, invented by Hero of Alexandria, 100 B.C.