This invention relates to ornamental devices of the general type shown in my copending application, Serial No. 229,340, filed October 9, 1962. The present invention combines structure producing ornamental waterfall effects, the device when in operation producing a very pleasing and novel ornamental effect.

Briefly stated, a plurality of liquid curtains of progressively increasing length are arranged in a pattern. Each of the liquid curtains includes a series of substantially vertical lines under tension and each carrying liquid droplets descending along the lines into a liquid collector which produces a visual effect of slow falling raindrops. The liquid collector of each liquid curtain assembly discharges by fall into a lower liquid collector or in the series, thereby producing a pleasing multiple waterfall effect. The combination of the multiple waterfall effect and the liquid curtain raindrop effect is highly ornamental.

The principal object of this invention is to provide novel structure for producing both of these effects simultaneously.

In the drawings:
FIGURE 1 is a side elevation partly broken away, showing a preferred embodiment of this invention.
FIGURE 2 is a bottom plan view thereof.
FIGURE 3 is a transverse sectional view of the lowermost portion of the device.
FIGURE 4 is a transverse sectional view showing one of the liquid curtain assemblies and taken substantially on lines 4—4, as shown in FIGURE 2.
FIGURE 5 is a fragmentary plan view partly broken away, showing substantially on the lines 5—5, as shown in FIGURE 4.
FIGURE 6 is a sectional elevation taken substantially on the lines 6—6, as shown in FIGURE 5.
FIGURE 7 is a sectional detail taken substantially on the lines 7—7, as shown in FIGURE 5.
FIGURE 8 is a sectional detail taken substantially on the lines 8—8, as shown in FIGURE 5.

Referring to the drawings, the suspended ornamental device comprises a plurality of liquid curtain assemblies 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19, progressively increasing in length and diameter. All are suspended from a ceiling structure 26. Each of the liquid curtain assemblies with the exception of 19, the longest, is of substantially the same construction. As shown in FIGURE 4, the liquid curtain assembly 14 includes a plurality of monofilament lines 22 extending vertically under tension between a liquid distributor 23 and a liquid collector 24.

Two rows of lines 22 are shown in the drawings, but this is by way of illustration only. The distributor 23 may be circular in form and the lines 22 on upper portion 26, which has the cross section of inverted T. A plurality of holes 27 are drilled in the horizontal flange of this T-section 26, and the lines 14 extend through these holes.

The lines 14 also extend through apertures 28 which are formed in the bottom wall 29 of the circular trough 30. The two rows of lines 22 on T-section 26 are held in assembled relationship by means of the metal clips 31 (see FIGURE 7), and the parts 26 and 30 are collectively referred to as the distributor. The distributor 23 is supported by means of a plurality of chains 33 and turnbuckles 34 from a structural support 35 above the ceiling structure 36.

The lower ends of the lines 14 are anchored to the liquid collector 24 by means of the circular trough 38. Supports 39 secure the trough 38 to the circular dish member 40, which has considerable weight. The ends of the lines 14 may be secured by any convenient means, and, as shown in the drawings, this includes short metal tubes 41, having their central portions spaced together laterally by means of a crimping tool, not shown. These tubular attachments 41 are too large to pass through the openings 27 or 42, and hence they serve to hold the lines under tension by the suspended weight of the collector 24 and the weight of any liquid contained therein.

Liquid is introduced into the distributor 23 by means of a supply pipe 45 mounted on the ceiling structure 36. This pipe 45 encircles the upper end of the lines 14 and is connected at intervals to the distributor trough 30 by means of lateral tubes 46 and suitable fittings 47 (see FIGURE 8). Liquid in the trough 30 passes downward through the apertures 28 which are larger in diameter than the lines 14 which pass through them. The liquid then descends along the lines in a series of droplets and is received within the collector trough 38.

The dish member 40 is of larger diameter than the collector trough 38, and the outer rim thereof is depressed at one point on its periphery to form a pouring lip 51. This pouring lip 51 is positioned directly over another dish member in the series so that liquid spilling from one dish member to the next produces an ornamental waterfall effect.

The dish member 40a at the lower end of the longest liquid curtain assembly 19 does not have such a lip 51, but is provided with a motor-driven pump 54 mounted within a central enclosure 55 on the liquid collector 24. The pump inlet 56 receives liquid within the collector 24 and pumps it through outlet pipe 57 to the elevated reservoir 58. Gravity flow from the reservoir takes place through pipe 59 to the supply pipes 45 through branch pipe 60. Flow from the reservoir 58 may be regulated or cut off by means of the valve 61. A float-operated switch 63 serves to shut off the pump 54 when the liquid level in the dish member 40a falls below a predetermined height. A conduit 64 extends upward from the pump and centrally of the liquid curtain assembly 19 and passes through the ceiling structure 36. This same conduit 64 also encloses the electrical cable 65 for operating the motor-driven pump 54.

The lines 14 are preferably monofilament nylon lines in the size range of approximately 0.030" to 0.050" diameter. Water may be used as the liquid to form the droplets. It has been found that triethylene glycol, which is colorless but of greater viscosity than water, is better suited for the purpose. Furthermore, triethylene glycol does not readily evaporate in air. The size of the droplets and their speed of descent depends upon the particular liquid employed, the thickness of the lines, the size of the openings 28 in the bottom wall of the distributor, and the hydraulic head in the distributor. The droplets do not descend at precisely the same rate, and hence a rather striking ornamental effect is produced. The individual droplets act as tiny lenses to catch the light and appear to sparkle and twinkle as they descend, like slowly falling rain. The ornamental effect may be heightened by employing fluorescent material in the liquid and by employing a light source which emits rays of light rich in the spectrum of the ultraviolet, to cause the descending droplets to fluoresce.

In operation, liquid from the reservoir passes through the valve 61 and into the circular supply pipes 45. The liquid then passes via lateral branches 46 into the distributor rings 23 at the upper end of each of the liquid curtain assemblies. These distributor rings 23 are all supported.
at substantially the same elevation. The liquid passes downward through openings 28 in the bottom wall of the distributor troughs 38 and spills over into the dish members 40, which form a part of each liquid collector 24. Each of the dish members 40 receives liquid from the lines 14 which support it, and, in addition, each of the dish members, except for the first in the series, receive liquid by a waterfall effect from the next-highest dish member in the series. All of the liquid descending on all of the lines 14 eventually reaches the lowermost dish member 40a and is pumped back for recirculation by means of the motor-driven pump 54.

Having fully described my invention, it is to be understood that I am not to be limited to the details herein set forth, but that my invention is of the full scope of the appended claims.

I claim:

1. In an ornamental device of the type described, the combination of: a plurality of liquid curtain assemblies each having a series of lines extending between a liquid distributor and a liquid collector, each assembly having means securing opposite ends of said lines to maintain them under tension, whereby liquid in the distributor may descend by gravity in droplets along said lines into the liquid collector, said liquid curtain assemblies being of progressively increasing length and width and being arranged in a pattern to encircle the longest of said assemblies, means supporting the liquid distributors of said assemblies at substantially the same elevation, and each of the assemblies with the exception of said longest one having its respective liquid collector constructed to discharge by free fall into the next lowest liquid collector.

2. In an ornamental device of the type described, the combination of: a plurality of liquid curtain assemblies each having a series of lines extending between a liquid distributor and a liquid collector, each assembly having means securing opposite ends of said lines to maintain them under tension, whereby liquid in the distributor may descend by gravity in droplets along said lines into the liquid collector, said liquid curtain assemblies being of progressively increasing length and being arranged in a pattern to encircle the longest of said assemblies, means supporting the liquid distributors of said assemblies at substantially the same elevation, and each of the assemblies with the exception of said longest one having its respective liquid collector constructed to discharge by free fall into the next lowest liquid collector.

3. In an ornamental device of the type described, the combination of: a plurality of liquid curtain assemblies each having a series of vertical lines extending between a liquid distributor and a liquid collector, each assembly having means securing opposite ends of said lines to maintain them under tension, whereby liquid in the distributor may descend by gravity in droplets along said lines into the liquid collector, said liquid curtain assemblies being of progressively increasing length and width and being arranged in a pattern to encircle the longest of said assemblies, means supporting the liquid distributors of said assemblies at substantially the same elevation, and each of the assemblies with the exception of said longest one having its respective liquid collector constructed to discharge by free fall into the next lowest liquid collector.

4. In an ornamental device of the type described, the combination of: a plurality of liquid curtain assemblies each having a circular series of vertical lines extending between a circular liquid distributor and a circular liquid collector, each assembly having means securing opposite ends of said lines to maintain them under tension, whereby liquid in the distributor may descend by gravity in droplets along said lines into the liquid collector, said liquid curtain assemblies being of progressively increasing length and diameter and being arranged in a pattern to encircle the longest of said assemblies, means supporting the liquid distributors of said assemblies at substantially the same elevation, and each of the assemblies with the exception of said longest one having its respective liquid collector constructed to discharge by free fall into the next lowest liquid collector.

5. In an ornamental device of the type described, the combination of: a plurality of liquid curtain assemblies each having a series of vertical lines extending between a liquid distributor and a liquid collector, each assembly having means securing opposite ends of said lines to maintain them under tension, whereby liquid in the distributor may descend by gravity in droplets along said lines into the liquid collector, said liquid curtain assemblies being of progressively increasing length, means supporting the liquid distributors of said assemblies at substantially the same elevation, and each of the assemblies with the exception of said longest one having its respective liquid collector constructed to discharge by free fall into the next lowest liquid collector.