Aug. 22, 1967 F. W. H. BOND 3,337,134

DISPLAY FOUNTAIN

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FIG. 1

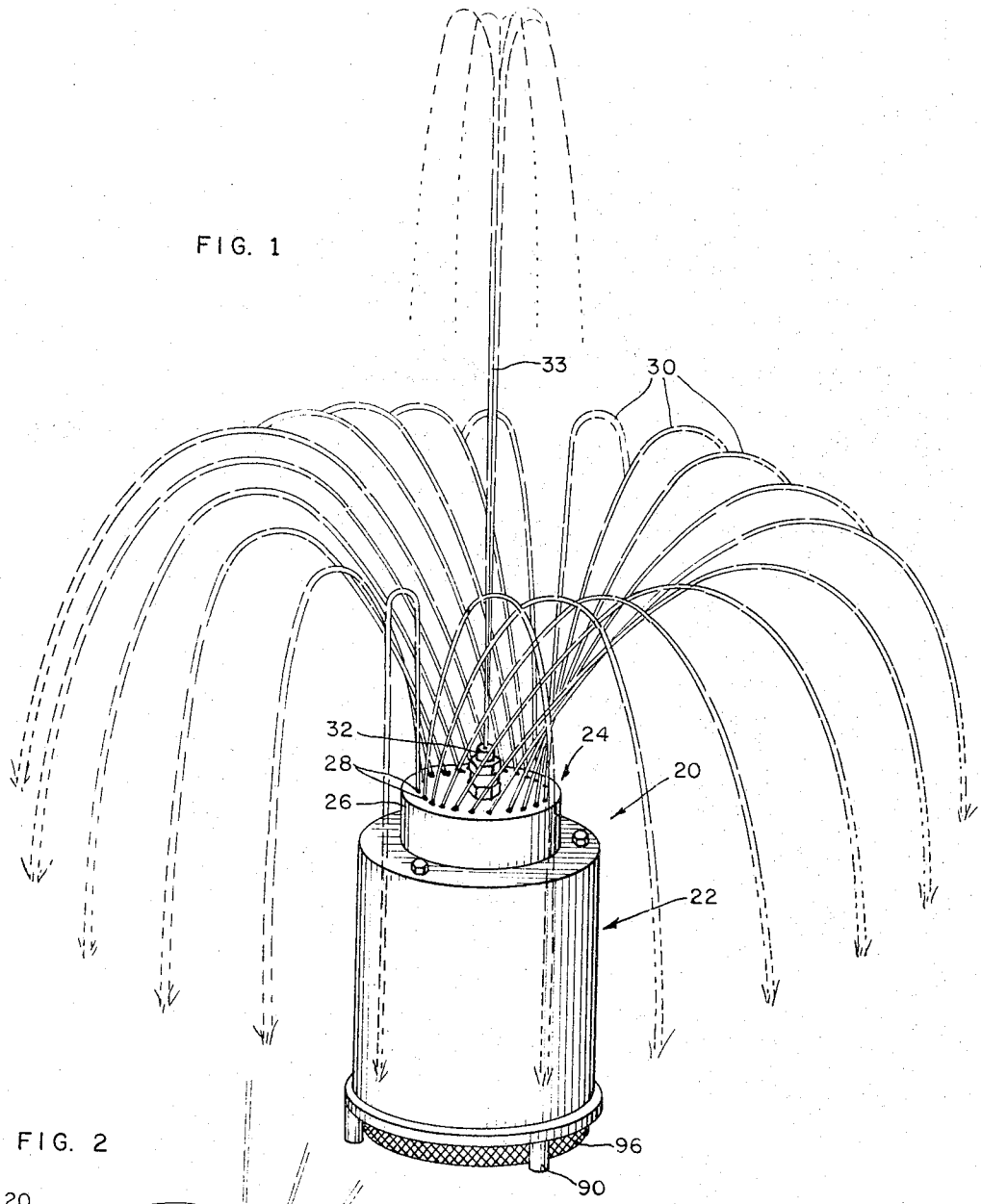
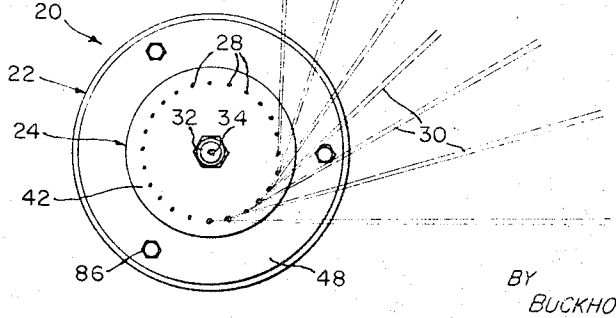


FIG. 2



FRED W. H. BOND
INVENTOR

BY
BUCKHORN, BLORE, KLARQUIST & SPARKMAN
ATTORNEYS

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FIG. 3

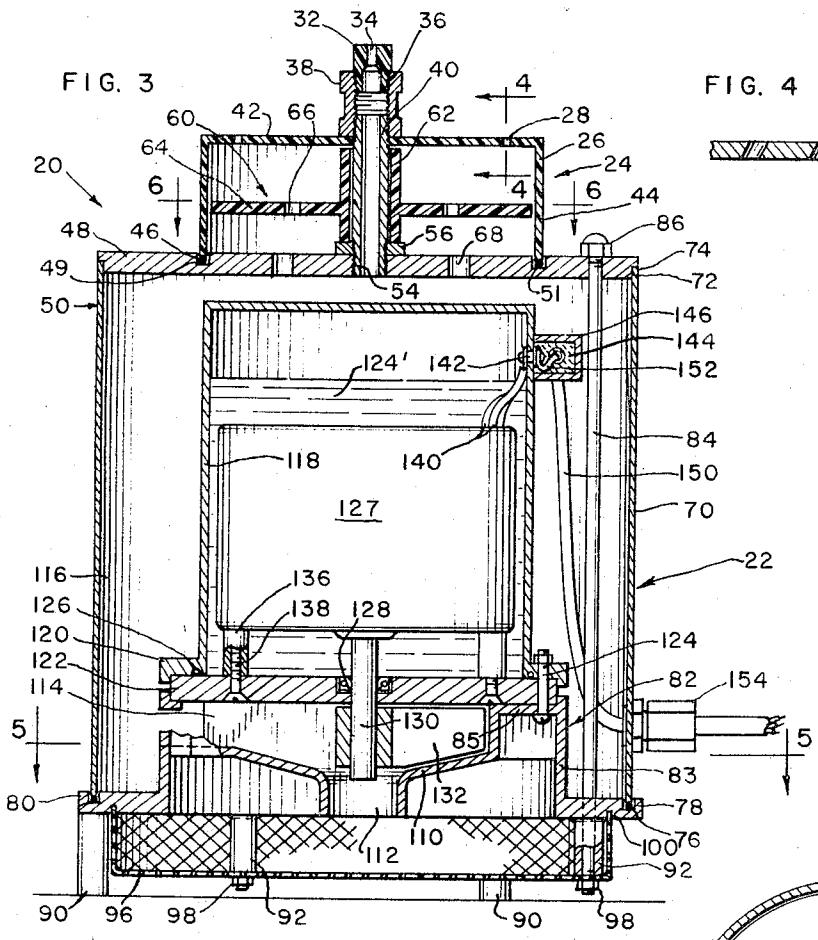


FIG. 4

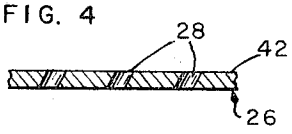


FIG. 6

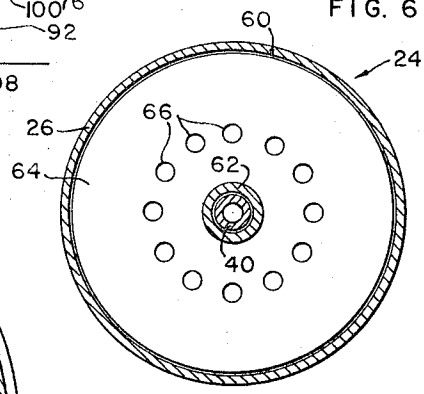
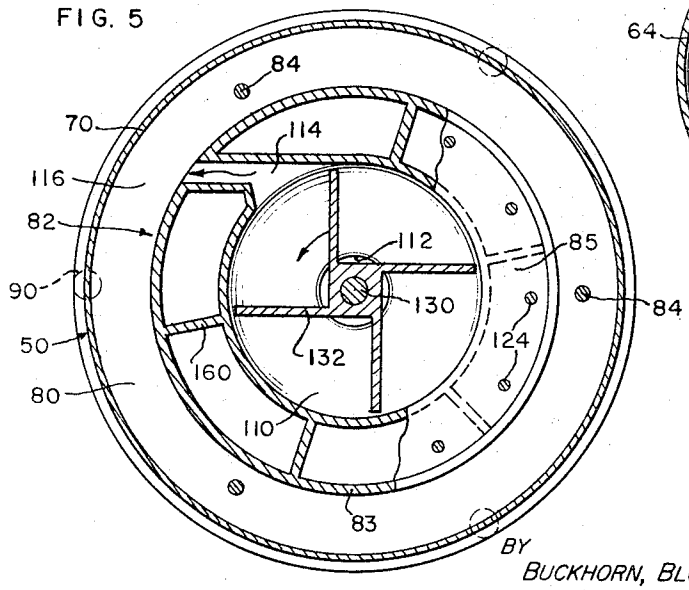


FIG. 5



FRED W. H. BOND
INVENTOR

BY
BUCKHORN, BLORE, KLARQUIST & SPARKMAN
ATTORNEYS

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FIG. 7

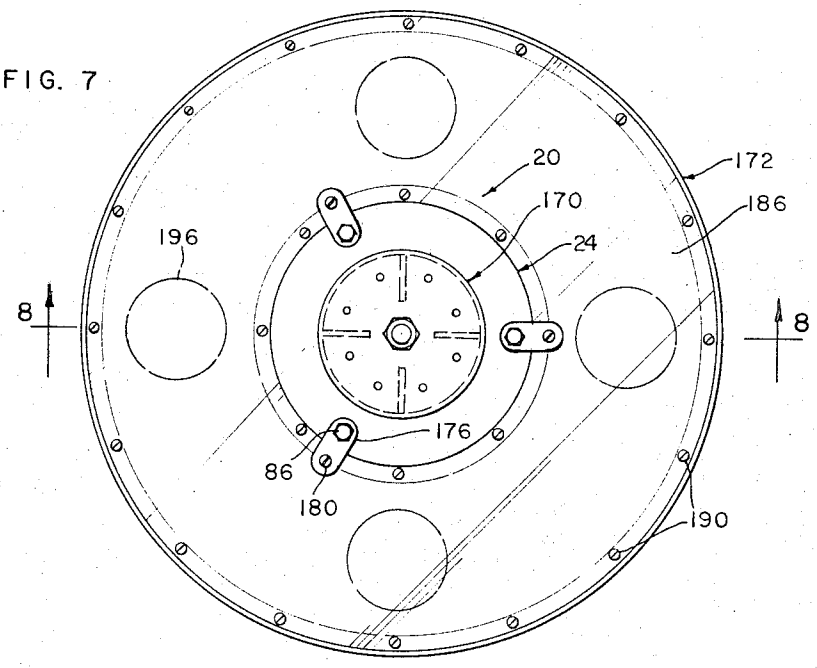


FIG. 8

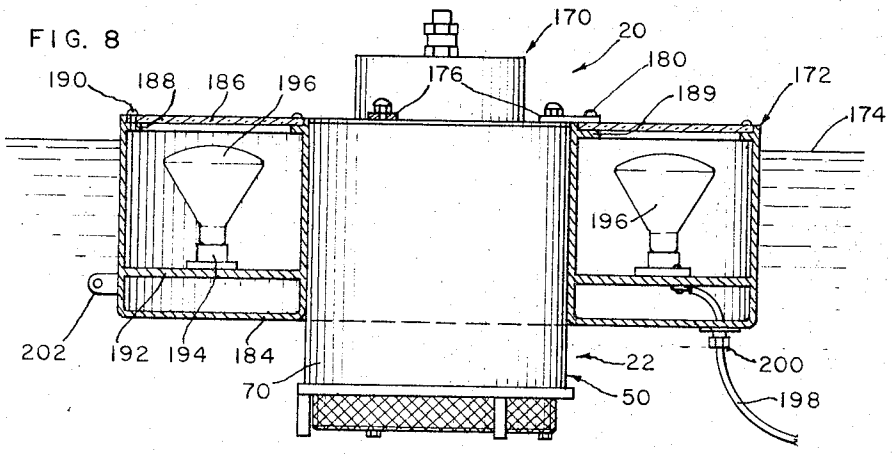


FIG. 11

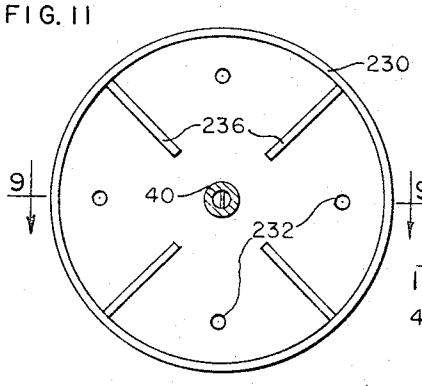


FIG. 9

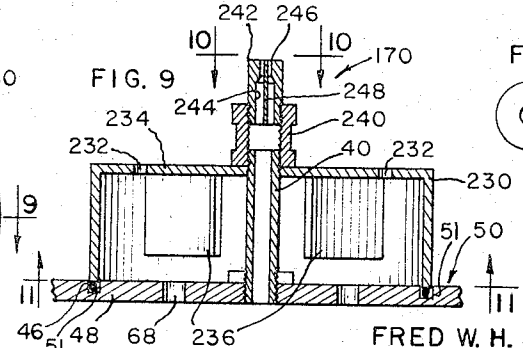
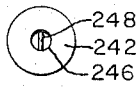


FIG. 10



FRED W. H. BOND
INVENTOR

BY
BUCKHORN, BLORE, KLARQUIST & SPARKMAN
ATTORNEYS

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DISPLAY FOUNTAIN

Fred W. H. Bond, St. Helens, Oreg., assignor to ABC Systems, Inc., St. Helens, Oreg., a corporation of Oregon

Filed Nov. 9, 1964, Ser. No. 409,882
5 Claims. (Cl. 239—19)

This invention relates to a display fountain, and more particularly to a unitary, portable, display fountain.

Many display fountains are known, but are not conveniently portable and are very expensive in their construction. There has existed a need for a small, inexpensive portable display fountain which will provide an attractive water display in gardens, clubs, motels and similar commercial enterprises. It would also be desirable for such a fountain to be used in efficiently aerating fish ponds, agitating stock tanks and also to act as a sump pump.

An object of the invention is to provide a new and improved display fountain.

Another object of the invention is to provide a unitary, portable, display fountain.

Yet another object of the invention is to provide a display fountain having interchangeable spray heads to vary the pattern of spray therefrom.

A further object of the invention is to provide a display fountain having a compact integral pump and spray head construction.

Still another object of the invention is to provide a portable spray fountain which may be positioned in a stationary position in a decorative pool or may be floated in such a pool.

The invention provides a portable display fountain having a pump unit and a spray head. Preferably the spray head is detachable from the pump unit and is interchangeable with one of numerous other spray heads having different patterns of spray. Preferably the pump unit includes a sealed motor unit having a shaft extending from the lower end thereof on which is mounted a pump impeller and the pump unit is supported by a combined base pump housing which fits on the bottom of the motor unit and surounds the impeller to form a pump housing. The housing also has an annular flange extending laterally beyond the pump unit with an inverted cup-shaped housing enclosing the pump unit and forming an annular passage around the pump unit to the top of the housing on which is mounted removably an inverted, cup-shaped spray head sealed to the top of the housing and secured to the top of the housing by a central nozzle threaded on a nipple carried by the top of the housing.

A complete understanding of the invention can be obtained from the following detailed description of a portable display fountain forming a specific embodiment thereof, when read in conjunction with the apended drawings, in which:

FIG. 1 is a perspective view of a display fountain forming one embodiment of the invention;

FIG. 2 is a top plan view of the fountain of FIG. 1;

FIG. 3 is an enlarged vertical sectional view of the fountain of FIG. 1;

FIG. 4 is an enlarged, fragmentary, vertical sectional view taken substantially along lines 4—4 of FIG. 3;

FIG. 5 is an enlarged horizontal sectional view taken substantially along line 5—5 of FIG. 3;

FIG. 6 is an enlarged horizontal sectional view taken substantially along line 6—6 of FIG. 3;

FIG. 7 is a top plan view of the fountain of FIG. 1, with an illuminating float attachment secured thereto;

FIG. 8 is a vertical sectional view taken substantially along line 8—8 of FIG. 7;

FIG. 9 is an enlarged, fragmentary vertical sectional

view of an alternate spray head of the display fountain of FIG. 1;

FIG. 10 is an enlarged top plan view of a nozzle of the spray head of FIG. 9, taken substantially along line 10—10 of FIG. 9; and

FIG. 11 is a horizontal sectional view taken substantially along line 11—11 of FIG. 9.

Referring now in detail to the drawings, there is shown in FIG. 1 a unitary portable display fountain 20 including a combined pump and motor unit 22 having detachably secured thereto for the purpose of interchangeability a spray head 24, which forms, with the combined pump and motor unit 22, the compact lightweight display fountain 20. The lower portion of the unit 22 is immersed in a pool of water and pumps the water therethrough into the spray 24. The spray head 24 includes an inverted, cup-shaped plastic spray head 26 preferably of transparent plastic material. The spray head member 26 has a plurality of orifices 28 therein, all sloping in the same direction, proceeding around the top of the member 26, for forming jets 30 which give the effect of a basket weave. The spray head 24 also includes a nozzle 32 (FIGS. 1, 2 and 3) also preferably of transparent plastic material, directing a single centrally located jet 33 directly upwardly.

The ozzle 32 (FIG. 3) has an orifice 34 and a threaded shank portion 36 which is threaded into the upper end of an internally, threaded sleeve 38, which in turn, is threaded onto the upper end of a pipe nipple 40 of brass and bears against the top 42 of the spray head member 26 and presses cylindrical portion 44 of the spray head member downwardly against an O-ring gasket 46 to seal the member 26 to the top 48 of housing 50 of the pump and motor unit 22. The O ring 46 is seated in the groove 51 forming the top 48. A bushing 56 of electrical insulating material such as, for example, nylon is screwed into a tapped bore 54 in the center of the top 48. The bushing is threaded on the lower end of the nipple 40 and mounts the nipple on the top 48. The bushing prevents electrolysis between the brass nipple and the top 48 which is of aluminum. A diffuser plate 60 (FIGS. 3 and 6), preferably of transparent plastic material, includes a vertical sleeve portion 62 fitting loosely on the nipple between the nut 56 and the top 42 of the spray head 26. It also includes an annular diffuser plate of baffle 64 having orifices 66 spaced around the sleeve 62. The top 48 of the housing 50 also includes metering orifices or passages 68 spaced along a circle centered on the tapped bore 54 for supplying water from the interior of the housing into the lower portion of the member 26. The water passes through the passages 66 in the diffuser plate 64 into the potrion of the member 26 above the baffle 64, and thence through the orifices 28. The water also travels through the nipple 40 and through the orifice 34 in the nozzle 32 from the interior of the housing 50. The sleeve 38 may be unscrewed from the nipple 40 and the spray head 24 removed from the nipple 40 so that it can be replaced by any one of numerous spray heads having different orifice patterns when it is desired to create a different pattern from that of the spray head 24. For example, a spray head having parallel orifices instead of the sloping orifices 28 may be used.

The housing 50 has a cylindrical portion 70 (FIGS. 3 and 5) which fits closely and sealingly on a reduced portion 72 of the top 48 and against a shoulder 74 on the top 48. The lower end of the cylinder 70 abuts an O-ring seal 76 positioned in an annular groove 78 in a flange 80 of a pump housing 82, which also forms the base of the housing 50. The pump housing preferably is formed of plastic material, one good material therefor being "Cycolac." The housing 70 is held sealed against the top 48 and against the O-ring seal 76 by three tie rods 84, acorn nuts 86 being threaded onto the upper end por-

tions of the tie rods 84. The base 82 has three legs 90 designed to support the unit 20 and rest on a support such such as the bottom of a pool in which the display fountain 20 is positioned. The housing 82 has three shorter spacer sleeves 92 which receive the lower ends of tie rods 84 and are adapted to engage the bottom of a cup-shaped strainer 96, which is held against the lower ends of the spacers 92 by nuts 98 on the tie rods. The rim of the cup-shaped strainer 96 extends into a downwardly facing annular groove 100 formed in the bottom of the flange 80 of the pump housing 82 and strains water entering into the hollow lower portion of the pump housing 82.

The pump housing 82 (FIGS. 3 and 5) has a pump housing portion 110 including a central downwardly directed tubular inlet 112 and a generally tangential outlet 114 leading into an annular passage 116 defined by the housing 50 and a motor housing 118 which is substantially smaller in diameter than the cylinder 70 and is spaced from the top 48 of the housing 50 to permit water to flow between the top of the housing 118 and the top 48 of the housing 50. The housing 118 has a cupped lower flange 120 to which a combined bottom and mounting plate 122 is secured by bolts 124 with an O-ring seal 126 positioned therebetween and sealing the housing 118 to the plate 122 to prevent the escape of oil 124' in which electric motor 127 is immersed. The plate 122 also forms the top of the pump housing. The plate 122 carries a known seal 128 therein surrounding a drive shaft 130 of the motor and preventing escape of the oil 124' therefrom and entrance of water into the housing 118. A molded plastic impeller 132 keyed to the shaft 130 is driven thereby in a counterclockwise direction as viewed in FIG. 5 to draw water upwardly through the entrance 112 (FIG. 3) of the pump housing portion 110 and force the water through the exit 114 to swirl the water rapidly around the annular passage 116. The water continues to swirl as it travels through the nozzle 32 and in the jet 33 to provide a very pleasing effect.

The motor 126 is mounted by spacers 136 and cap-screws 138 on the plate 122 and has electrical leads 140 connected to connectors 142 carried by the housing 118 and sealed by a mass 144 of electrically insulating, sealing and waterproofing epoxy potting compound enclosed within a plastic connector housing 146. The connector housing 146 is secured to the housing 118 and may be of acrylic material. An electrical cord 150 having waterproof jacket thereon as is well known in the art has conductors 152 connected to the connectors 142 and is enclosed and sealed in the mass 144 of sealing and waterproofing compound. If desired, a connector block may be molded on the end of the cord 150 and sealed to the housing 118. The cord 150 extends through the passage 116 and out of the housing 50 through a packing gland 154 and thence to an electrical plug (not shown) on the end thereof which may be plugged into any suitable electrical socket to supply power to the motor 126. A manually operable switch is preferably provided in the cord 150 at a point remote from the gland 154 for starting and stopping the motor 126 as desired.

The pump housing 82 (FIGS. 3 and 5) has the upwardly facing cup-shaped pump housing portion 110 and also is cup-shaped and downwardly facing with the bottom of the pump housing portion 110 forming the top of the downwardly facing cup-shaped portion thereof. Radially extending webs 160 are provided around the exterior of the pump housing portion 110 to impart strength and rigidity thereto and also to impart strength and rigidity to the housing 82. The housing 82 is provided with an outer cylindrical wall 83 joined to the flange 80 and has an annular top 85.

In FIGS. 7 to 11 the fountain 20 is shown as including the combined motor and pump unit 22 with a spray head 170 substituted for the spray head 24 and with a float ring 172 secured to and supporting the fountain 20

buoyantly in a pool 174 of water. The float ring 172 is an attachment and is fastened to and fits closely around the housing 50. The float ring is fixed to the unit 22 by straps 176 secured to the tie rods 84 by the acorn nuts 86 and by screws 180 to the float ring 172. The float ring 172 includes an annular cup-shaped member 184 having its opening facing upwardly and covered by an annular glass or transparent plastic plate 186 secured on annular flanges 188 and 189 and fixed thereto by screws 190 with a suitable, known sealing compound positioned between the ribs 188 and 189 and the plate 186 to hermetically seal the plate 186 to the member 184. The member 184 has shelves or brackets 192 mounting sockets 194 for floodlight lamps 196 and a power supply cord 198 supplies electrical power to the lamps 196 and extends through a sealing packing gland 200 in the member 184. The member 184 also has an eye 202 secured to the exterior thereof for the attachment of an anchoring strand thereto to moor the float ring and the fountain carried thereby.

The spray head 170 (FIGS. 7 to 11) includes a cup-shaped spray head member 230 having orifices 232 therein, which are substantially cylindrical and parallel and also has, depending from the top 234 thereof, baffle plates 236, which prevent swirling movement of the water supplied to the interior of the member 230 and remove turbulence therefrom, the water being supplied through the openings 68 in the top 48 of the housing 50. The spray head member 230 is held in position by a coupling sleeve 240 screwed on the upper end of the nipple 40 and carries antiswirl nozzle 242 screwed into the upper end of the coupling. The nozzle 242 has a counterbore 244 therein and an orifice bore 246. A baffle or antiswirl plate 248 is fixed to the nozzle 242 by brazing or welding in a position bisecting the counterbore 244 and orifice bore 246 to prevent any turning or swirling movement of the water being forced through the nozzle 242, the swirling movement being imparted to the water by the centrifugal pump of the fountain 20. The member 230 and nozzle 242 may be composed of transparent plastic material.

The above-described fountain is very compact, has easily interchangeable spray heads which may be quickly interchanged, may be used in shallow pools resting on the bottom thereof, as illustrated in FIGS. 1 to 6, or with the float ring 172 may be used in deeper bodies of water. Also, the float ring 172 containing the floodlight lamps 196 provides illumination to increase the beauty of the display fountain. The fountain unit is small, rugged and simple in its construction and is easily transported from place to place for use or storage thereof. It is ideally adapted to be used in lily ponds and the like without any other effort of installation than merely setting the fountain on the bottom of such pool or pond.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. In combination,

pump means,

casing means surrounding the pump means and having at the top thereof a central tapped outlet bore and a plurality of outlet openings positioned around the outlet bore,

a tubular member having a threaded lower end screwed into the tapped outlet bore and also having a threaded upper portion,

an inverted, cup-shaped spray head member having a central opening and a plurality of outwardly located spray openings positioned on the casing means with the central opening slidable on the tubular member,

and nozzle means screwed on the upper portion of the tubular member and holding the spray head member against the casing means.

2. In combination,
a casing means including a top plate having an annular groove in the upper face thereof, a tapped bore concentric with the annular groove, and a plurality of openings positioned between the groove and the tapped bore,
means for forcing water upwardly through the openings and the bore,
sealing means in the groove,
a cup-shaped spray head member having a rim portion engaging the sealing means, a central opening positioned over the tapped bore and a plurality of spray orifices spaced around the central opening,
a distributor plate having a central sleeve portion having a passage aligned with and extending between the tapped bore and the central opening in the spray head member and also provided with a plate portion having passages spaced around the sleeve portion,
a nipple threaded into the tapped bore and extending through the sleeve portion and the central opening in the spray head member,
and a nozzle member threaded onto the upper end of the nipple and holding the spray head member against the sealing means.

3. In combination,
a fountain unit having spray means at the top thereof and also having a cylindrical casing,
a hollow, annular float ring fitting on the cylindrical casing and open at the top thereof,
means for securing the float ring to the cylindrical casing,
a plurality of lamps in the float ring,
and transparent cover means enclosing the lamps and covering and sealed to the top of the float ring.

4. In combination,
a pump unit having a bottom inlet and a side outlet,
casing means loosely surrounding the sides of the pump unit and defining therewith an annular passageway from the outlet to the top of the casing means and having an outlet opening at the top thereof,
an inverted, cup-shaped spray head having a plurality of outwardly located spray openings positioned on the casing means in communication with the outlet opening,
means holding the spray head against the casing means,
and baffle means comprising a disc having openings therein and positioned between the top and bottom of the cup-shaped spray head and extending generally parallel to the top of the cup-shaped spray head.

5. In combination,
a pump unit having a bottom inlet and a side outlet,
casing means loosely surrounding the sides of the pump unit and defining therewith an annular passageway from the outlet to the top of the casing means and having an outlet opening at the top thereof,
an inverted, cup-shaped spray head having a plurality of outwardly located spray openings positioned on the casing means in communication with the outlet opening,
means holding the spray head against the casing means,
and baffle means comprising a plurality of plates extending vertically in the cup-shaped spray head and spaced around the center of the cup-shaped spray head and extending generally radially relative to the cup-shaped spray head.

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EVERETT W. KIRBY, *Primary Examiner.*