No. 871,191. PATENTED NOV. 19, 1907.

A. D. SOUTHAM.

ELECTRICALLY OPERATED FOUNTAIN.

APPLICATION FILED AUG. 4, 1906.

4 SHEETS—SHEET 1.

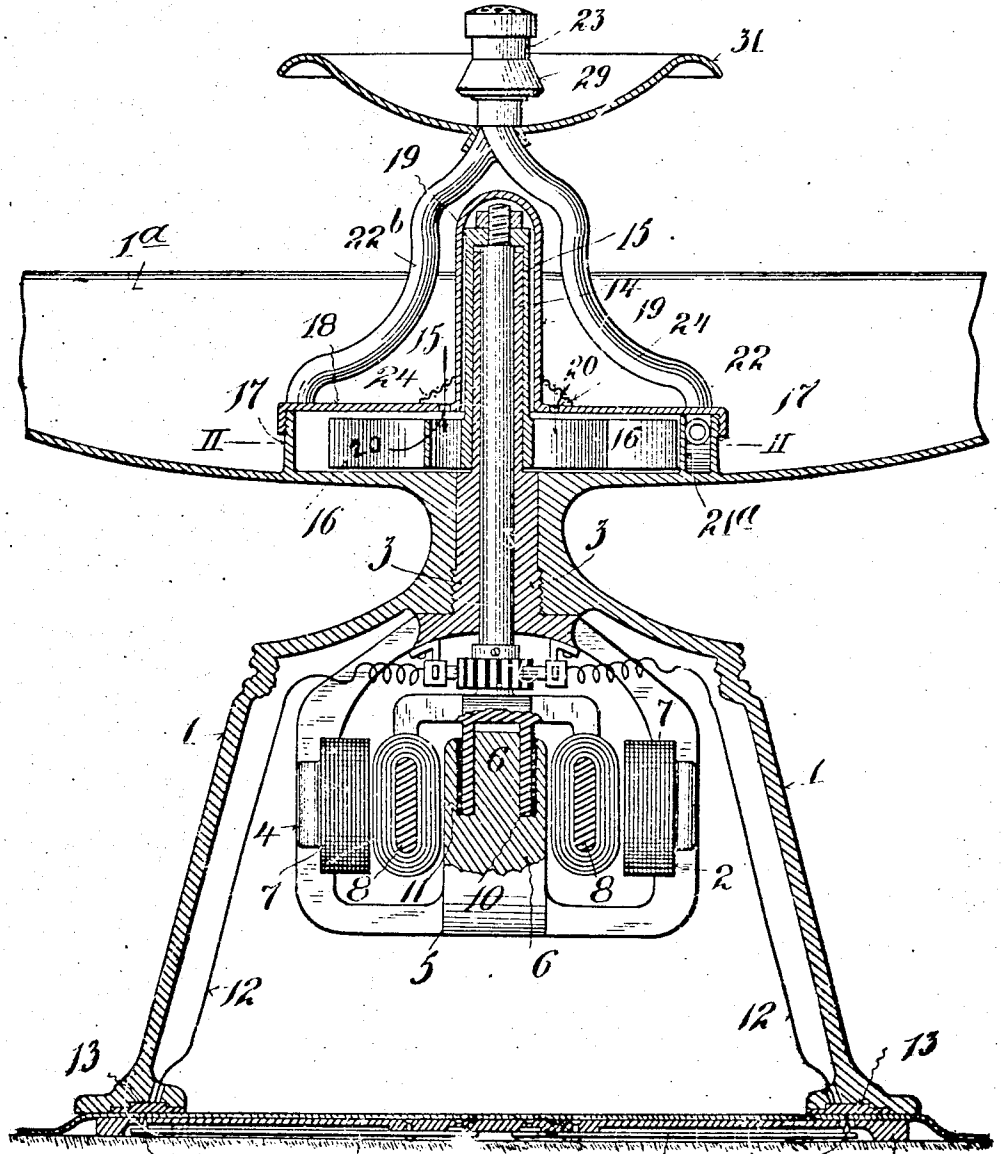

fig. 1.

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4 SHEETS—SHEET 2

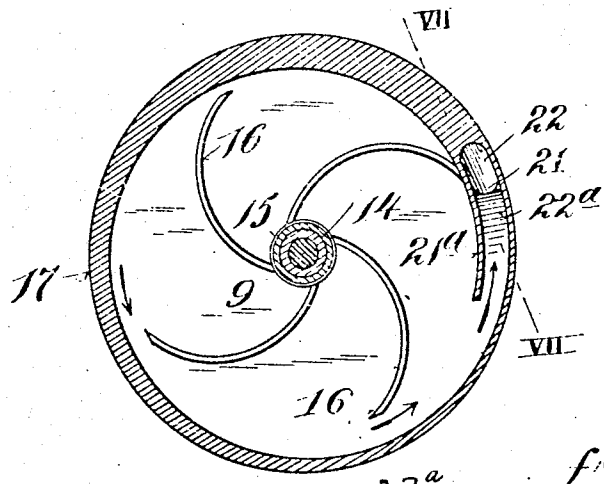

fig. 2

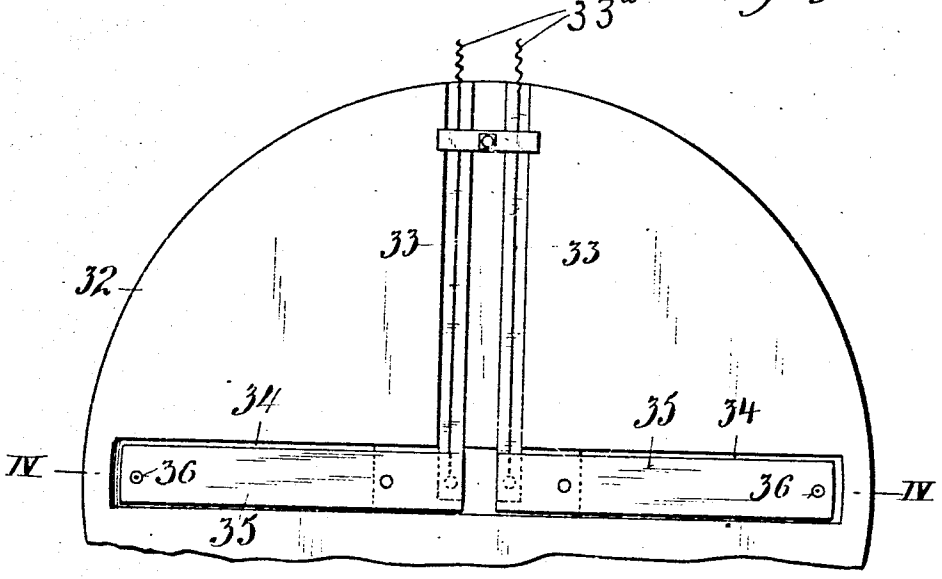

fig. 3

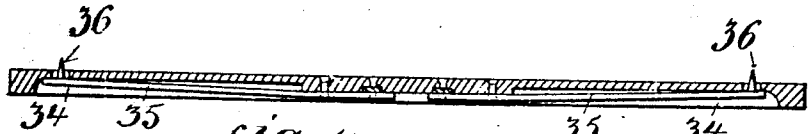

fig. 4.

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4 SHEETS—SHEET 3.

fig. 5

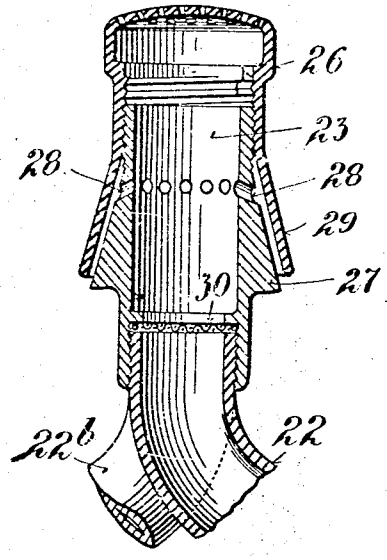
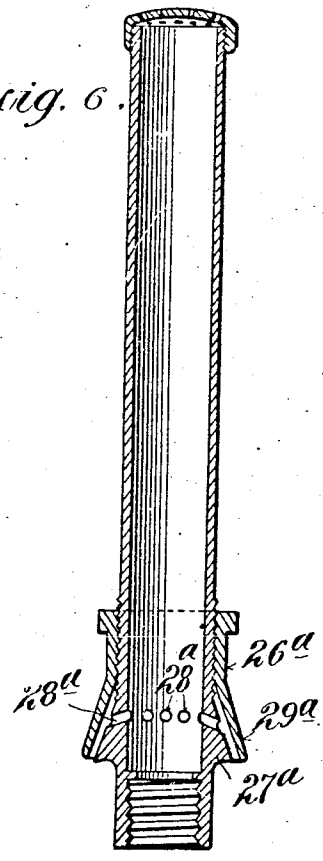


fig. 6.



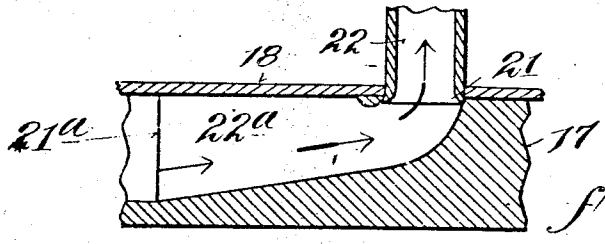


fig. 7.

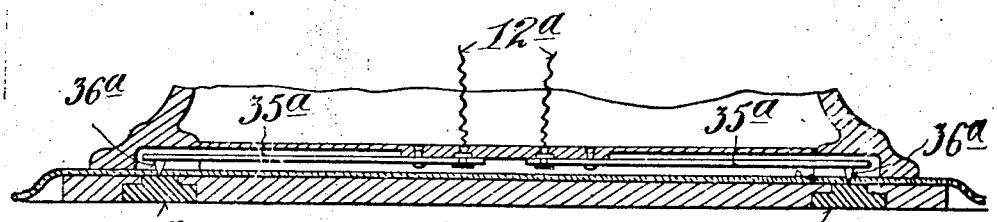


fig. 8.

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4 SHEETS—SHEET 4.

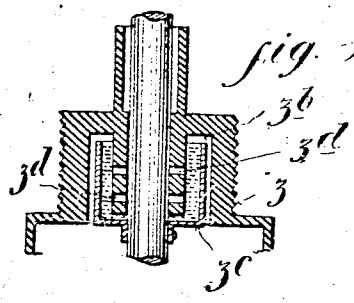

fig. 10.

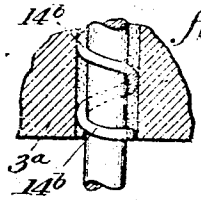

fig. 12.

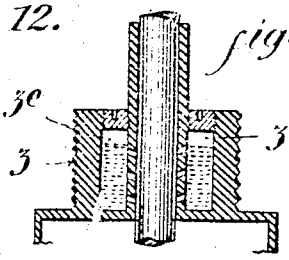

fig. 11

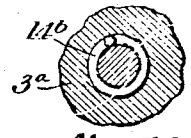

fig. 13.

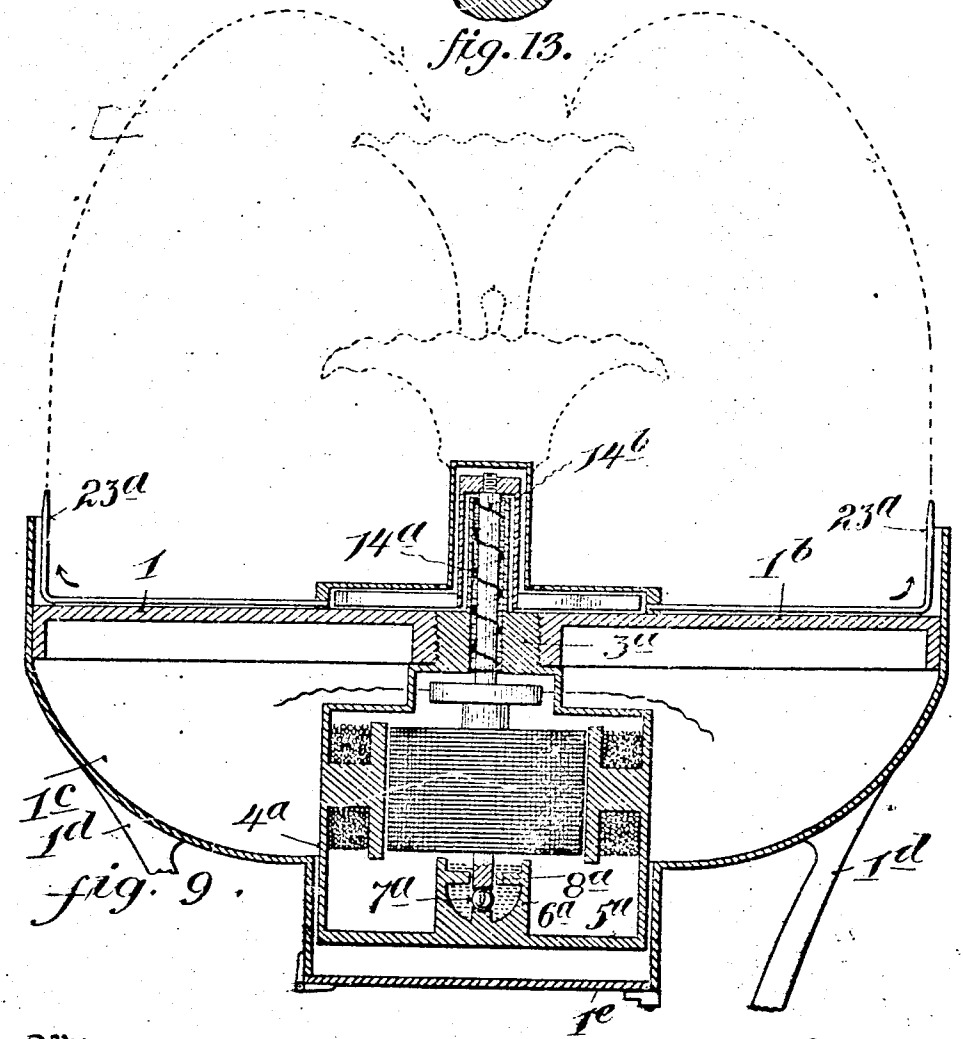

fig. 9.

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UNITED STATES PATENT OFFICE.

ARTHUR DUDLEY SOUTHAM, OF HARTFORD, CONNECTICUT.

ELECTRICALLY-OPERATED FOUNTAIN.

No. 871,191. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed Aug. 4, 1906. Serial No. 329,157.

To all whom it may concern:

Be it known that I, ARTHUR DUDLEY SOUTHAM, a citizen of the United States of America, residing at Highland Court, city and county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Electrically-Operated Fountains, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of the apparatus; Fig. 2 a horizontal sectional view on the line II—II of Fig. 1; Fig. 3 a bottom plan view of the transmission disk; Fig. 4 a transverse sectional view thereof; Fig. 5 an enlarged vertical sectional view of the nozzle; Fig. 6 a similar view of a slightly different form of discharge pipe; Fig. 7 a detail vertical sectional view of a portion of the pump casing taken on a line VII—VII of Fig. 2; Fig. 8 a transverse vertical sectional view showing a slightly different arrangement of the contact points for completing the electric circuit; Fig. 9 a vertical sectional view showing a slightly different form of basin, and motor containing casing or support; Fig. 10 a vertical sectional view of a slightly different form of lubricating means; and Fig. 11 another form of lubricating device. Fig. 12 an enlarged detail sectional view of the motor-shaft support shown in Fig. 9; and Fig. 13 a detail horizontal sectional view thereof.

This invention relates to fountains in general, but more particularly to small fountains designed for table and indoor use and decoration.

The invention has for one of its objects to provide a fountain of artistic and pleasing design in which will be contained means for forcing the water upwards to form the jet or jets; and means whereby the water or other liquid contained in the fountain may be forced through the jet or jets over and over again. By being thus continuously circulated through the fountain, there will be no waste (except from evaporation), and no possibility of leakage, and the fluid may be perfumed or tinted, or both, as desired. Furthermore, the fountain is portable and can be readily moved at pleasure.

A further object of the invention is to so locate and connect the pump and motor that no fixed or accurate alinement by means of a union, toggle-joint or coupling is necessary to adjust the position of the motor and pump and their shafts; also, so that the motor may be separated from the pump, at any time for the purpose of repairs, adjustment or oiling; and so that on replacing the motor, the pump and motor will at once be located in correct alinement.

A further object of the invention is to provide the motor shaft with means of lubrication, so that there will be no necessity for oiling the same for lengthy periods.

Another object of the invention is to deaden or eliminate any noise or "hum" which may be produced by the motor, so that the fountain operates silently.

A further object of the invention is to provide means for making the electric connection between the electric mechanism in the fountain and the outside source of supply; and particularly, to establish electric connection when the fountain is placed on a table, so that visible wires are dispensed with, and without having to materially injure the table cloth or cover by making holes through which the connecting wires would otherwise have to be passed.

A further object of the invention is to provide a simple and efficient combination of motor and pump for fountains which may be cheaply constructed and silent in action, and capable of operating for lengthy periods without requiring attention or lubricating, with means for obtaining access to the mechanism when necessary.

Other objects and advantages of the invention will appear hereinafter.

Referring to the various parts by numerals, 1 designates the pedestal or casing which is adapted to contain the operating apparatus. An electric motor 2 is arranged within this casing and is preferably suspended from the top thereof, by means of a screw head 3, to which is connected the motor frame 4. The top of this casing preferably forms an integral part of the bottom of basin 1^a, in which the pump is placed, so that the motor will be suspended from the bottom of the basin. One of the objects of thus suspending the motor, is to have the motor shaft as short as possible. The suspended motor frame 4 is provided with a bottom piece 5 in the center of which is formed an upward extending stationary centering pin or thrust block 6. This motor frame also carries the field magnet coils 7. The armature 8 is

carried by a vertical shaft 9 which extends vertically upward through the screw head 3, the armature coil extending downward from the end of said shaft and fitting properly within the field coils. Within the armature coil is arranged a depending tubular part 10 of the shaft, this tubular part fitting over the stationary centering pin carried by the motor-supporting frame. Around the centering pin is formed a cup 11 into which the tubular part 10 of the armature shaft extends, the lower end of this tubular part of the shaft resting on the bottom of said cup. This cup is somewhat larger than the tubular extension of the armature shaft and is adapted to be filled with oil or grease, the bottom of said cup taking the thrust of said shaft. It will, therefore, be seen that the armature is suspended by its shaft and that the oil or grease-cup and thrust block are protected by the armature. The electric circuit is completed through wires 12, connected to the motor and to the contact-plates 13 arranged in the bottom of the supporting casing. It will be noted that the motor-supporting frame is entirely suspended from the top of the casing, or the bottom of the basin, and does not touch the casing at any other point.

The screw head 3 is formed with an upward extending tubular part 14 through which extends the shaft of the armature, said tubular part extending within the basin to a point above the proposed water level therein. This tubular part excludes water from the casing 1 and serves as a guide and centering means for the armature shaft.

The pump I employ in this fountain is of the centrifugal type and preferably is provided with a plurality of properly curved horizontal blades. The pump consists of a central tubular shaft 15 which is adapted to fit over the extension 14 of the screw head. The upper end of the shaft is provided with a threaded aperture which is adapted to receive the threaded upper end of the armature shaft and a lock nut. The hollow shaft is of sufficient length to permit the blades 16, which are secured to the lower end thereof, to rotate close to the bottom of the basin. In the bottom of the basin is an upward extending annular flange 17 which surrounds the pump and forms a pump casing or chamber. This chamber is provided with a suitable cover 18 and to the center of this cover an upward extending tubular extension 19 is secured, this extension projecting above the upper end of the hollow shaft and inclosing the same. In the cover at the base of the tubular part 19, a number of small holes 20 are formed which serve as inlets into the pump casing and, through which water will flow from the basin. The pump casing is provided with an outlet 21, or its circumference, through which water will pass from said casing to the outlet pipe 22 which leads upward to the discharge nozzle 23. A projecting wall 21^a which is parallel with the outer wall of the casing forms a channel 22^a leading to the discharge outlet. The bottom of this channel is inclined upward to the discharge outlet as illustrated in Fig. 7. The water from the pump passes into this channel and then upward into the pipe 22 as will be readily understood. The inlet holes 20 are preferably covered by a strainer or filter 24 to prevent foreign matter passing into the pump casing. The purpose of this is to prevent the fine jets or nozzles from becoming choked.

To regulate the discharge I provide the regulating nozzle 23. This nozzle is secured on the upper end of the discharge pipe 22 and consists of a screw cap 26 provided with apertures in its top. The nozzle 23 is formed with a downwardly enlarging portion 27 and at the upper end of this enlarging portion perforations 28 are formed. The cap is provided at its lower end with a flared part 29 which is adapted to fit closely on the outer surface of the enlargement 27, and thereby close the perforations 28. It will thus be seen that by adjusting the cap 28 on the end of the nozzle 23 the discharge through the perforations 28 may be regulated. In this way the nozzle may be used as a pump-check or governor. By unscrewing the cap from the end of the nozzle water will pass freely through the perforations 28 and thence downward, and be discharged from under the lower end of the cap. Of course, by screwing the cap down, said apertures may be entirely closed. In this way the amount of water passing through the jet openings in the top of the nozzle may be regulated. Within the nozzle 23 below the apertures 28 is arranged a strainer or filter 30. Supported on the pump casing is an upper smaller basin 31 into which the discharge from the perforations 28 of the nozzle falls. Of course, the overflow from said top basin falls into the main basin below.

In Fig. 6 is shown an arrangement of the parts wherein the jet regulating device is below the spraying cap. In this form of the device the discharge pipe is provided with an enlargement 27^a and perforations 28^a near its lower end. On this pipe and adapted to close the perforations is a regulating sleeve 26^a formed with the flaring part 29^a. The operation of this form of the device is exactly as that hereinbefore described and shown in detail in Fig. 5. 22^b is a dummy pipe, similar in appearance to pipe 22, and is merely for the purpose of giving to the fountain a symmetrical appearance. It will, of course, be understood that this pipe and pipe 22 may be provided with couplings (not shown) in order that they may be detached when dismanting the fountain.

To electrically connect the motor within the casing to the conductor wires I provide a contact plate or transmission disk 32, adapted to be located under the table cloth where the fountain is adapted for use on a table. This disk is formed with grooves 33 through which the conductor wires 33^a are adapted to extend to the center of the disk. The disk is also formed in its under side with a recess 34 in which two spring contact plates 35 are secured, said contact plates being arranged above the lower surface of the plate so that they will not contact with the surface of the table. The outer end of each of these plates is provided with an upward extending needle point 36 which extends upward through a perforation in the disk, and through the table cloth, when said disk is arranged under a cloth. These points are fine and will readily pass through a table or other cloth without injury thereto. The inner ends of the conductor wires are connected to the inner sides of the contact plates. The pedestal or casing of the fountain is so placed over the transmission disk or contact plate that the contact points carried by the pedestal will rest upon the contact points 36 carried by the spring plates. The upward pressure of the spring plates forces the needle points against the contact plates carried by the casing so that a good electrical contact is made, and at the same time the springs permit the needles to be depressed so that the fountain will be level and may rest on the table cloth. Instead of securing the spring contact plates in the transmission disk 32 I may desire to secure said spring contact plates to the bottom of the pedestal as shown in Fig. 8, and in this view 35^a are the contact plates; 36^a the needle points carried thereby. The transmission disk is provided with contact plates 13^a to which the conductor wires are suitably connected; and the wires 12^a are connected to the spring contact plates 35^a and to the motor. As shown in Fig. 1 the basin is formed as an integral part of the supporting pedestal or base.

In Fig. 9 the top of the motor containing casing 1^c forms the entire bottom of the basin, and the motor containing the casing appears to be merely a part of the basin, instead of a supporting pedestal. In this arrangement of the parts, supporting legs 1^d are employed. The top 1^b of the casing 1^c might be termed a false bottom for the basin, the apparent bottom of the basin being the bottom of the supporting casing. By this means the motor is very close to the pump, and the motor shaft can be made very short. This is very desirable for obvious reasons. The bottom of the casing 1^c is closed by a hinged door 1^e by which access to the motor may be had, a suitable catch being provided to hold said door in its closed position. The bottom piece 5^a of the motor supporting frame 4^a is provided with an upward extending lubricating cup 6^a in which is arranged a bearing ball 7^a the lower end of the motor shaft bearing against said ball. The lubricating cup is formed near its upper end, with an inward extending wall 8^a through which the motor shaft extends and by which said shaft is centered on the bearing ball. The lubricating cup to a point above the wall 8^a is filled with grease or other suitable lubricating material. In this form of the device, the motor shaft is slightly smaller in diameter than the interior of the tubular extension 14^a of the head 3^a and the space surrounding said shaft is filled with a lubricating compound or material, such as grease. Within said tubular extension and head is arranged a spiral coil of wire 14^b which, preferably, is in the form of a spring. This spiral is attached to the tubular extension by solder, or in any other suitable manner, and the motor shaft extends through it. It will thus be seen that the spiral forms a means for supporting the lubricating material, and as a bearing for the shaft. It also supports the shaft in the lubricating material, and with a very slight bearing surface. Instead of forcing the water to a single elevated central nozzle, I may in some cases, prefer to have a series of nozzles 23^a around the periphery or outer margin of the basin, as shown in Fig. 9. These nozzles may be arranged to deliver the water to an elevated central cup, as indicated in dotted lines in said figure. It will, of course, be understood that if desired, the jet regulating nozzle, such as shown in Figs. 1, 5 and 6, may be used in the arrangement of jets shown in Fig. 9.

In Figs. 10 and 11, are shown slightly different forms of centering and lubricating devices for the upper portion of motor shaft. As shown in Fig. 10, the head 3 is formed with a recess 3^b. To the motor shaft, below said head, is attached a cup 3^c. This cup extends up into said recess and receives the lubricating compound. Apertures 3^d are formed through the inner tubular part of the head 3, through which the lubricating compound may pass to the shaft.

In Fig. 11 a channel 3^e is formed in the head 3 to receive the lubricating compound, the apertures being provided through which the compounds may pass to the motor shaft. It will thus be seen, that by providing means for holding a supply of lubricant around the motor shaft, near its ends, the motor may be run for a long period of time without the necessity of re-lubrication.

The form of the apparatus illustrated in Fig. 9 is especially adapted for large fountains, where, if the motor were mounted in a base or pedestal below the basin, or what appears to be the basin, the motor shaft would be too long to obtain the best results, but so far as the principle of the invention is con-

cerned, it will, of course, be understood, that the two constructions shown are the mechanical equivalents of each other.

By suspending the motor as described I largely overcome the noise or hum made by the rotating armature. It will be noted that by the peculiar construction of the motor and pump no special care will be required in assembling the parts or in alining the armature shaft and the pump shaft, the pump and armature shaft being practically one solid piece.

From the foregoing it will be seen that I provide a very simple electric motor and pump for operating the fountain; and that these fountains may be used for table or other decorations with novel and artistic effects. It will be noted that the water or other liquid used in the fountain will not be wasted but will be used over and over again, so that it may be perfumed or tinted or both to secure the desired effect.

It will be apparent that an endless number and variety of designs of supporting casings, basins and nozzles can be made; and that different types of rotary pumps may be employed without departing from the scope of my invention. It will, of course, be understood, that the motor and the pump may be located in any convenient position within casing. It is also clear that the fountain may be placed on an ornamental bracket or on a stand or pedestal in hallways, reception rooms and the like.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof and extending to a point above the normal water level thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting said pump to the motor shaft above the tubular plug, a nozzle, and means for delivering the fluid from the pump to said nozzle.

2. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting the said pump to the motor shaft above the tubular plug, a nozzle, and means for delivering the fluid from the pump to said nozzle.

3. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting the said pump to the motor shaft above the tubular plug, a nozzle, means for delivering the fluid from the pump to said nozzle, and a bearing formed on the lower part of the armature-supporting frame and adapted to receive the lower end of the armature shaft.

4. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting the said pump to the motor shaft above the tubular plug, a nozzle, means for delivering the fluid from the pump to said nozzle, a bearing formed on the lower part of the armature-supporting frame and adapted to receive the lower end of the armature shaft, and means for maintaining a supply of lubricant around the motor shaft above and below the armature.

5. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof and extending to a point above the normal water level thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting said pump to the motor shaft above the tubular plug, a nozzle, means for varying the discharge from the nozzle, whereby said nozzle may be used as a governor device.

6. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof and extending to a point above the normal water level thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting said pump to the motor shaft above the tubular plug, a nozzle, means for delivering the fluid from the pump to said nozzle, an adjustable cap forming part of the nozzle and by which the discharge from the nozzle may be varied.

7. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its

lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting the said pump to the motor shaft above the tubular plug, a nozzle, means for delivering the fluid from the pump to said nozzle, a base supporting the basin, contact plates in the bottom of said base, commutator brushes connected to the motor frame, electric connections between said commutator brushes and the contact plates in the base, a disk to support the base, spring plates secured to the bottom of said disk, contact points carried on the free ends of said spring plates and adapted to project up through apertures in the disk and adapted to engage contact plates in the base, and means for connecting the spring plates to a source of electrical supply.

8. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof and extending to a point above the normal water level thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, a rotary pump within the basin, means connecting said pump to the motor shaft above the tubular plug, a nozzle, means for delivering the fluid from the pump to said nozzle, an upward extending lubricating cup carried by the lower end of the motor-supporting frame and adapted to receive the lower end of the armature shaft, a ball in said cup to support the shaft, and means for centering said shaft on said ball.

9. An electric fountain comprising a basin, a central tubular plug detachably connected to said basin at the bottom thereof and extending to a point above the normal water level thereof, its lower end carrying a depending motor frame below the basin, a motor shaft extending upward through said tubular plug and carrying at its lower end within the motor frame the motor armature, said shaft being smaller in diameter than the interior diameter of the tubular plug, a spiral lubricant support within said tubular plug and rigidly secured thereto, said spiral bridging the space between the armature shaft and the interior wall of the tubular plug, whereby said spiral will form a bearing for the shaft, a rotary pump within the basin, means connecting said pump to the motor shaft above the tubular plug, a nozzle, and means for delivering the fluid from the pump to said nozzle.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 24th day of January 1906.

ARTHUR DUDLEY SOUTHAM.

Witnesses:
HERBERT A. ROSS,
CORA A. STEIN.