

Sept. 22, 1931.

E. VEDOVELLI

1,824,518

WATER DISPLAYING AND ILLUMINATING DEVICE

Original Filed Sept. 11, 1925 3 Sheets-Sheet 1

Fig. 1.

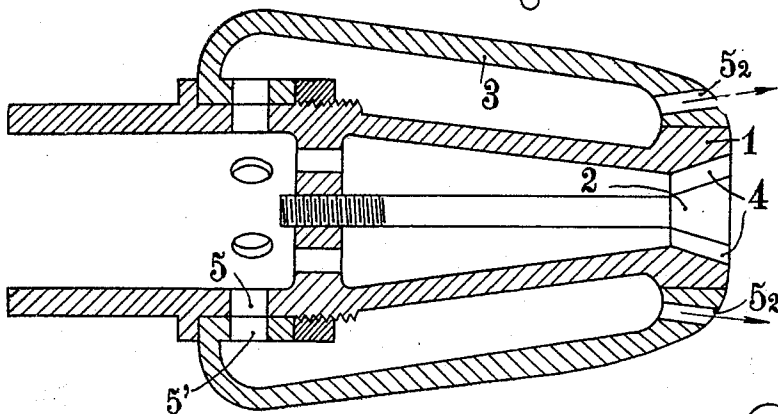


Fig. 4.

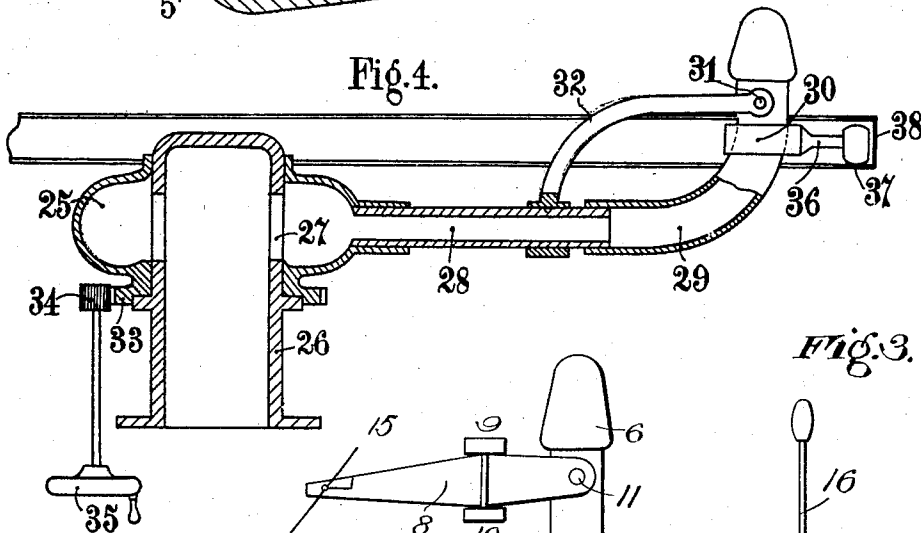


Fig. 3.

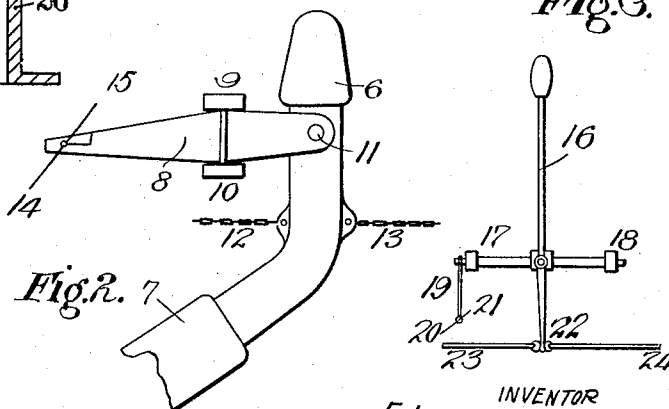


Fig. 2.

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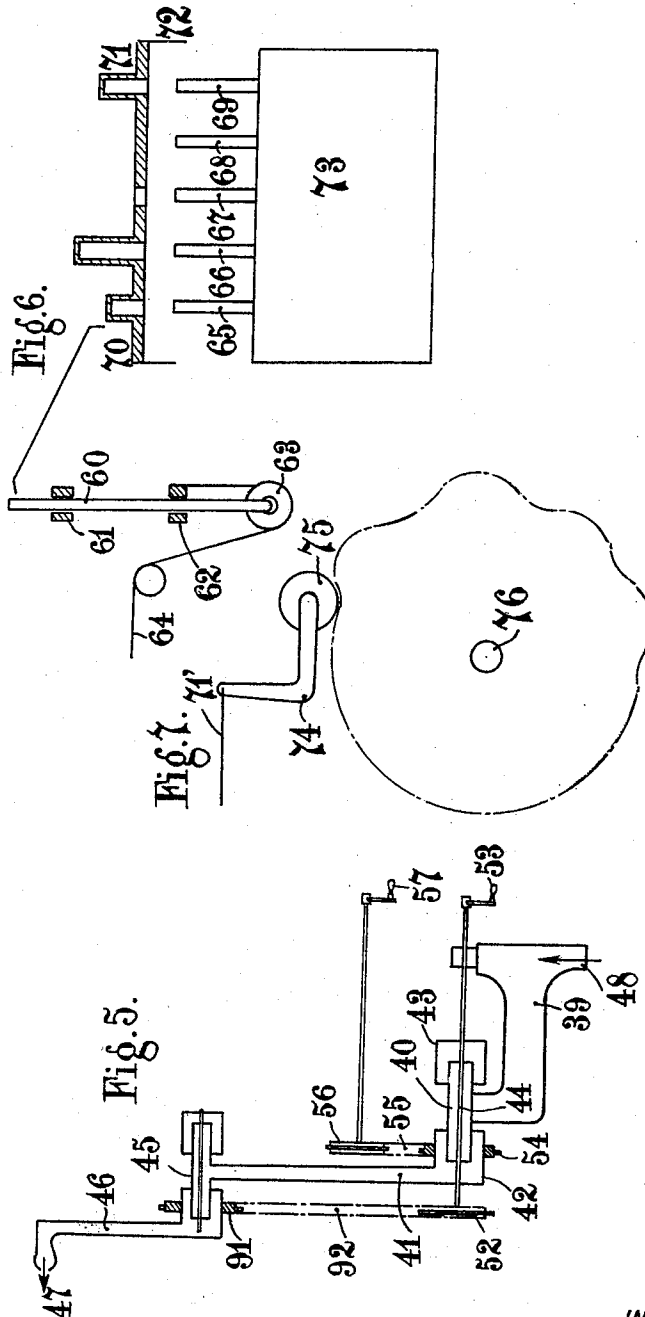
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WATER DISPLAYING AND ILLUMINATING DEVICE

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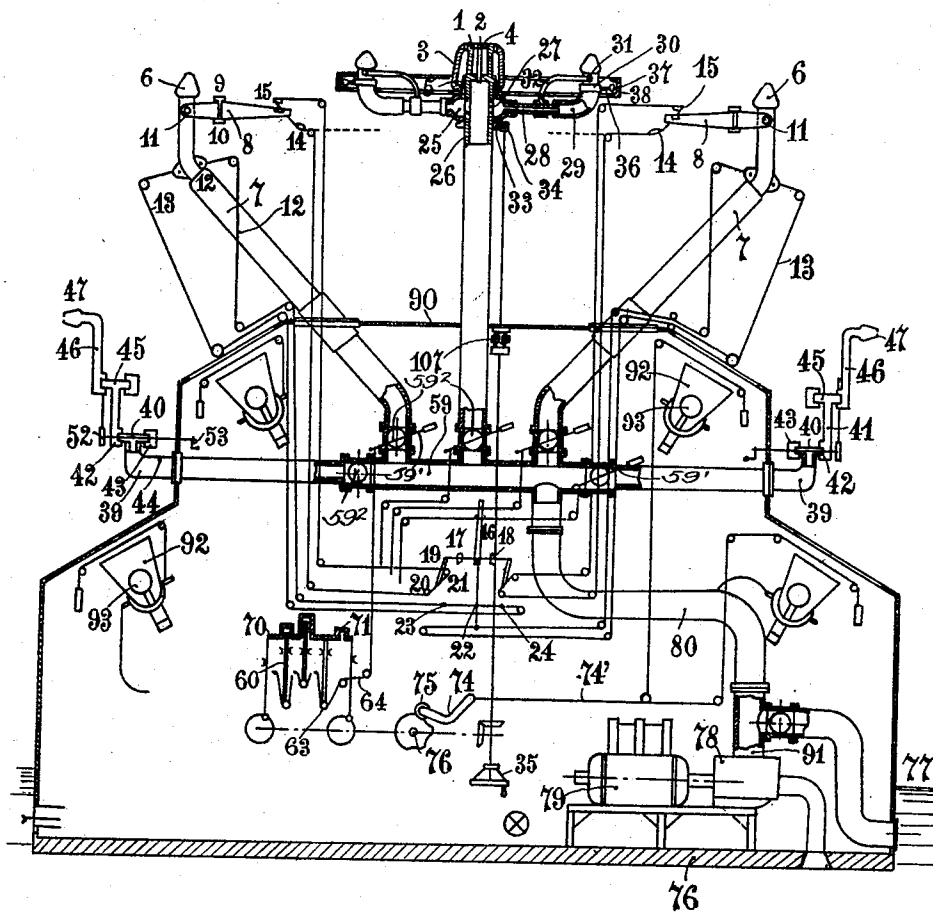
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WATER DISPLAYING AND ILLUMINATING DEVICE

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Fig. 8.



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WATER DISPLAYING AND ILLUMINATING DEVICE

Substitute for and continuation of application Serial No. 55,766, filed September 11, 1925, and in France February 27, 1925. This application filed February 10, 1930. Serial No. 427,283.

The present invention relates to devices permitting ornamental and scenic effects to be obtained either with water jets alone or with water jets embellished by means of plain, colored or variegated luminous beams, glow lamps or searchlights.

This application is a substitute for and continuation of a co-pending application filed in the name of Edouard Vedovelli on September 11, 1925, as Serial No. 55,766.

Ornamental water displays have long been known, and since electricity is available, they have been at times illuminated. The object of this invention is to provide special means which will be hereinafter described for permitting said luminous and other water displays to be animated.

In the accompanying drawings:

Figure 1 is an enlarged sectional view of the type of nozzle employed in the invention;

Fig. 2 is a view showing one form of device for shifting the nozzles;

Fig. 3 is a diagrammatic view of a lever connection for the same purpose;

Fig. 4 shows another form of nozzle-controlling device or system;

Fig. 5 is a diagrammatic view of still another nozzle-shifting device;

Fig. 6 is a diagrammatic view, partly in section, of a controlling mechanism for varying the water delivery;

Fig. 7 is a diagram of another form of controller which can be used in the apparatus;

Fig. 8 is a sectional view of a fountain for use afloat.

Throughout the several views the same reference numerals indicate the same or like parts.

The invention consists, as shown, of an apparatus, preferably portable, comprising all the elements or parts required for obtaining the desired result. This apparatus may be positioned on a pond, on a river, in a park, on a theatrical stage, etc., and it comprises a combined hydraulic and mechanical set, an electrical set and an assembling set which will be successively described.

A.—Hydraulic and mechanical set

Water under pressure is supplied by suit-

able distributing devices, such as pumps, mains etc., and is led through pipes to special nozzles or spouts which constitute one of the features of the invention.

In Figure 1, a tubular body 1 forms a sort of pipe through which water is discharged; its outlet end terminating in a tapered or conical part inside which is located a core member having a mushroom-shaped head 2 which, by being screwed into or out of a perforated partition in the pipe 1, can be adjusted to permit variation of the size of the tapered discharge opening 4. This device enables either a circular or a conical jet of water to be obtained, and in either case the double wall of the liquid stream so obtained facilitates refraction of light.

On the outside of pipe 1 is a sleeve 3 fitted thereon to rotate with slight friction and forming an annular chamber which communicates with the inside of the pipe through holes 5' and 5. By rotating sleeve 3 about its axis, the holes 5' therein can be made to register more or less with the holes 5 in pipe 1, thereby regulating the quantity of water that will pass from the pipe into the annular chamber. The said chamber is itself pierced at its outer end with a plurality of holes 5", so that the central hollow stream or jet spouting from opening 4 will be surrounded with small jets, the size of which can be adjusted.

The description just given in connection with Fig. 1 is that of the preferred form of nozzle which is employed in the present fountain and it applies to all the nozzles hereinafter mentioned. In Fig. 8, several sets of nozzles are represented and are to be understood as all of the same type, even though the numerals appearing in Fig. 1 are applied only to the central top nozzle in Fig. 8.

Another characteristic feature of the invention is the fact that the nozzles are not fixed as to direction but can have imparted to them, by means of suitable devices, motions or movements which permit the direction of the jets to be changed. Some of the devices or arrangements devised according to the invention to obtain such movements will now be described.

Referring to Fig. 2, a nozzle or spout 6 of the type above-described is fed through suitable joints, unions and pipes; for instance, through a hose 7. Nozzle 6 is carried by a member 8 adapted to swing laterally about a vertical axis 9—10, and the nozzle may itself swing within said member 8 about a horizontal axle 11.

The vertical and lateral movements of the nozzle are independent of one another and may be effected by any suitable means; vertical movement, for instance, may be effected by means of two cables 12 and 13, while lateral movement may be obtained by means of two other cables 14 and 15. Said cables are connected by transmissions to a single operating lever which is so mounted, as will presently become apparent, that its motions will be the same as those of nozzle 6. Care should be taken to give sufficient length to the cables and, if required, to dispose the first direction-shifting gear in line with the axis in order to prevent the two movements from influencing one another, in a manner similar to the commonly-called "joy stick" of airplanes.

In Figs. 3 and 8, a lever 16 is shown which is pivotally connected by a Cardan-joint to a rod or shaft 17—18 mounted in two bearings. An arm 19 is fixed to one end of this shaft and is connected by two pulley-gear cables 20 and 21 to the two cables 14 and 15 so that when said lever 16 is shifted perpendicularly to the axis of shaft 17—18, nozzle 6 will be shifted in the same direction. The lever is provided with an extension 22, to the free end of which two cables 23 and 24 are connected, the latter cables being connected, in turn, to the two cables 12 and 13. Under these conditions, synchronism is insured between any shifting movement of lever 16 and the movement of nozzle 6.

Another characteristic feature of the invention is the fact that a plurality of nozzles such as 6 can be controlled by one and the same lever 16. For this purpose and with the above described device, it is merely necessary to connect to the lever extension 22 as many cables as there are nozzles to be operated. The nozzles may be arranged in line, or in a circle, or in tiers or otherwise, permitting, due to their simultaneous movements, unusual ornamental effects to be obtained.

An interesting effect can also be obtained with the foregoing device, as well as with those hereinafter described, by agitating the operating lever 16 more or less quickly, thereby imparting to the jets or streams of water a to-and-fro motion which produces sinuous movements of the stream and can even make it vibrate. By moving the lever in a circle, spiral, serpentine and twisting streams, etc., can be formed.

Fig. 4 illustrates an additional hydraulic

device which can be employed, and in which the water is supplied to a torus-shaped annular chamber 25 rotatable about a fixed tubular part 26 having apertures 27 formed through the part of the wall surrounded by said chamber. This chamber 25 carries on its periphery a number of radial arms 28, to the end of each of which is fitted, by means of a hose 29 or the like, a nozzle or spout 30 of the type above described; said nozzle 30 being adapted to swing in a vertical plane about an axle 31 mounted in an arm 32 fixed on tube 28.

The torus shaped part 25 carries at a suitable point a circular rack 33 driven by means of a pinion 34 and an operating hand wheel 35 conveniently positioned, so that it is thus possible to rotate said part 25 and all the arms 28 carried thereby. Water spouting through the nozzle 30 thus assumes a spiral form during such rotation; and under the action of centrifugal force (which may be increased and decreased at will by rotating the hand wheel 35 more or less rapidly) the figures produced are changed and complicated, thus obtaining sightly displays.

The arm 32 and axle 31 of the above device enable nozzle 30 to be swung in a vertical plane, elevating and depressing it, if desired, simultaneously with the rotary motion imparted by wheel 35. For this purpose, nozzle 30 can be rigidly connected to an arm 36 carrying at its end a roller 37, the axle of which is horizontal. Said roller engages in a hollow circular track 38; and if the track is fixed as to height, roller 37 will always run in the same plane, keeping nozzle 30 at a constant incline, but if track 38 is lifted parallelly to itself, while maintaining the same axis, nozzle 30 will be inclined toward or from the axis of rotation of chamber 25. In consequence, it is merely necessary to vary the vertical contour of the track in order to cause the axis of the nozzle to move more or less away from the vertical, and the same applies to all the nozzles mounted in the same manner. If the entire set represented in Fig. 4 be tilted with respect to the vertical, it is possible by rapidly rotating wheel 35, to obtain waterwheels, "suns", rosettes, etc.

What has been explained above, permits inclined water streams to be obtained, the jets of which rotate in circles and combinations thereof; but in order to achieve extremely ornamental effects, it is advisable to provide means whereby one and the same stream, while inclinable at will, can have its nozzle arranged at any desired point in space, with possible shifting of such point through space. This object can be attained by fitting any suitable nozzle or spout on the end of toggles and links each of which is mechanically controlled.

Fig. 5 shows such a device. A hollow support 39 carries a tube 40, on the upper part of

which is mounted a hollow cylinder 42 provided with a lateral arm or tube 41. Water is supplied to support 39 and passes there-through and through cylinder 42 into arm 41; but since the water pressure might disengage cylinder 42 or induce friction, the lower portion of tube 40 is provided with a cylinder 43 offering to the water pressure a surface identical with that of cylinder 42. These two cylinders 42 and 43 are connected by a spindle 44, so that the two pressures neutralize one another and the water pressure does not introduce any parasite friction. In its turn, arm 41 carries on its outer end a tube 45 similar to tube 40, which tube 45 itself carries another tubular arm 46 supplied with water in the same manner as just described. Water spouts through nozzle 47 which may be of the same type as those previously described or of any other kind.

As will be readily realized, it is possible, by disposing the arms 41 and 46 at a suitable angle relatively to each other, to insure that water, entering at a fixed point 48, will issue at any point in the plane of said arms. The required swinging movements of the arms may be effected by any suitable means; for instance, there may be rigidly fastened to the inner end of arm 46 a sprocket pinion 91 which is connected by a chain 92 with a pinion 52 mounted on an extension of spindle 44 rotated manually by a crank 53. The spindle 44 passes, of course, with slight friction through members 42 and 43, so as to form a tight joint without, however, carrying them around with it in its rotation.

Arm 41 is itself rotated by a sprocket pinion 54, a sprocket chain 55, another sprocket pinion 56, and a crank 57, so that by turning said crank the position of tube 45 will be shifted. By combining the motions of cranks 53 and 57, it is possible to position nozzle 47 at any desired point in the horizontal plane in which it moves, and to make it describe any desired movement, whether rectilinear, circular, epicycloidal, etc.

All the foregoing relates to the main object of the invention, which is to impart any desired motions to the streams of liquid spouting from the nozzles. In order to achieve all sorts of effects, provision should also be made for varying the hydraulic force of the streams or, in other words, for varying the water supply. Figure 8 shows one way in which this can be done.

The various pipes that feed the nozzles, as above described and in any number, lead to valves 59² positioned side by side and fed by a common feeder 59 which may be of any suitable form. In order to give more or less force to the various jets, the valves will, of course, merely have to be more or less opened. One of the characteristic features of the invention consists, then, in arranging the controls of such valves in a compact

mechanical device which permits them to be operated by manipulating a sort of keyboard or stops and also permits determining in advance the effects sought to be produced.

Any mechanical or even electric means may be used for this purpose. In the embodiment shown in Figs. 6, 7 and 8, each valve operating lever 59' is connected by a cable 64 to a vertical rod 60 slidably mounted in two guides 61 and 62; said rod carrying at its lower end a roller 63, around which the cable runs. Hence, the more rod 60 is depressed or pushed down, the wider the valve will be opened, and vice versa; valve closure being effected in this case merely by a weight or spring. The rods 65, 66, 67, 68, 69, etc., of the several valves are shown in Fig. 6 as below a bar 70 provided either with tubular projections 71 which are closed at their upper ends or with apertures. Consequently, if bar 70 is moved downward by any suitable means in the direction denoted by the arrow 72 towards the chest 73 out of which the rods 65—69 protrude, said rods will be depressed more or less according to the manner in which said bar is arranged. In the example shown in Fig. 6, rod 65 will be forced half-way down, rod 66 one-quarter down, rod 67 not at all, rod 68 all the way down, etc.

The above described device permits not only the regulation of the force of the water streams but also the selection of which streams will and which will not come into play.

Fig. 7 illustrates another form of controller comprising a cable 71' connected at one end to a lever 74 carrying a roller 75 which engages a circular cam 76 having on its periphery suitable humps and hollows so as to lift up and let down said roller during the rotation of the cam. This form of controller can be used for operating the valves, if desired, but is here shown as connected with the searchlights or lamps comprised in the electric set.

Devices such as those illustrated in Figs. 6 and 7 may also be used to control the inclinations of the nozzles 6 or 30. Furthermore, since it may happen that water is available from various sources under different pressures, the aforesaid devices will permit, by connecting together two or several feeders 59, water from any of said sources to be supplied by opening the proper valves at the proper time.

B.—Electric set

As already stated, the lighting of water displays has been known, and the lighting of the displays obtained through the above-described devices may be effected by any known and suitable means such as by colored searchlights, variously colored glow or other lamps, etc.

A characteristic feature of this invention, however, consists in the fact that the search-lights or projectors are controlled by devices such as shown in Figs. 7 and 8 whereby, with a single controlling device or with two different, but connected, controllers, hydraulic and electric effects can be obtained and regulated in a concomitant manner.

If, instead of using interposed colored glasses, it be desired to light up or put out the lamps, or to control solenoids intended to act on colored glasses, the cables 74' can serve in such case to throw the switches on or off; or again, the lever 74 may constitute the switch-lever; or still other devices may be utilized, none of such expedients requiring specific illustration because of the obviousness of the changes necessary.

C.—Assembling set

In order to turn the foregoing to advantageous, ornamental and scenic use, the installation and setting up thereof must be simple and rapid and the whole essentially portable.

A circular or other float or buoy 76 (Figure 8) is made of required diameter and depth, the water line being denoted by 77. The float has a cover 90, and inside it is a pump 78 driven by an electric or other motor 79. Water is pumped through a hose section 91 into a feeder 80 which leads to feeder 59, and thence through hose pipes 7, etc., to as many nozzles as desired. Located inside the float are projectors or search-lights of sufficient power and in sufficient number to emit the required light beams through the thick glass plates which render the float watertight. These projectors can be fed with electric current supplied either by a cable led in from outside or generated by a generator set located inside the float, each projector preferably embodying a reflector 92 of suitable size and shape containing within it a powerful lamp 93.

What is claimed is:—

1. In a fountain, a sprayer head comprising relatively-rotatable, concentric inner and outer water-receiving chambers provided with lateral apertures adapted to be brought into variable registration with each other consequent upon such relative rotation to provide communication between said chambers, and means for shifting said head in both vertical and horizontal planes.

2. In a fountain, a plurality of sprayer heads, means for shifting some of the heads in both horizontal and vertical planes, means independent of said shifting means for revolving other heads about a vertical axis, means for supplying water to all the heads, and means for illuminating the streams of water discharged by said heads.

3. In a fountain, a plurality of sprayer

heads, means for shifting some of the heads in both horizontal and vertical planes, means independent of said shifting means for revolving other heads about a vertical axis which is remote from the axes of the heads themselves, and means for supplying water to all the heads.

4. In a fountain, a plurality of sprayer heads, means for shifting some of the heads in both horizontal and vertical planes, means independent of said shifting means for revolving other heads about a vertical axis which is remote from the axes of the heads themselves, means for supplying water to all the heads, and means for illuminating the streams of water discharged by said heads.

5. In a fountain, a sprayer head comprising a relatively-stationary inner water-receiving chamber having a discharge aperture at its end, an outer water-receiving chamber enclosing the inner chamber and rotatable relatively thereto and also provided with a discharge aperture at its end; both chambers being formed with registrable lateral apertures to provide communication between them, the extent of such registration being controlled by the rotation of the outer chamber with relation to the inner chamber; and means for shifting said head in both vertical and horizontal planes simultaneously.

6. In a fountain, a set of sprayer heads; a flexible liquid supply pipe individual to each head; a set of levers, one for each pipe, engaged therewith to rock the sprayers from side to side in one direction; a set of cables for operating said levers; a separate set of cables for rocking the sprayers from side to side in another direction; and operating means for the cables.

7. In a fountain, a set of sprayer heads; a flexible liquid supply pipe individual to each head; a set of levers, one for each pipe, engaged therewith to rock the sprayers from side to side in one direction; a set of cables for operating said levers; a separate set of cables for rocking the sprayers from side to side in another direction; and a single element common to both sets of cables for operating the same.

8. In a fountain, a set of sprayer heads; a flexible liquid supply pipe individual to each head; a set of levers, one for each pipe, engaged therewith to rock the sprayers from side to side in one direction; a set of cables for operating said levers; a separate set of cables for rocking the sprayers from side to side in another direction; and a universally-mounted lever connected with both sets of cables.

In testimony whereof I affix my signature.

Mrs. E. VODEVELLI, née JEANNE HÉNAUX,

Executrix of the Estate of Edouard Vedovelli, Deceased.