No. 690,405.

Patented Jan. 7, 1902.

F. W. DARLINGTON.

FOUNTAIN.

(Application filed May 17, 1901.)

(No Model.)

4 Sheets—Sheet 1.

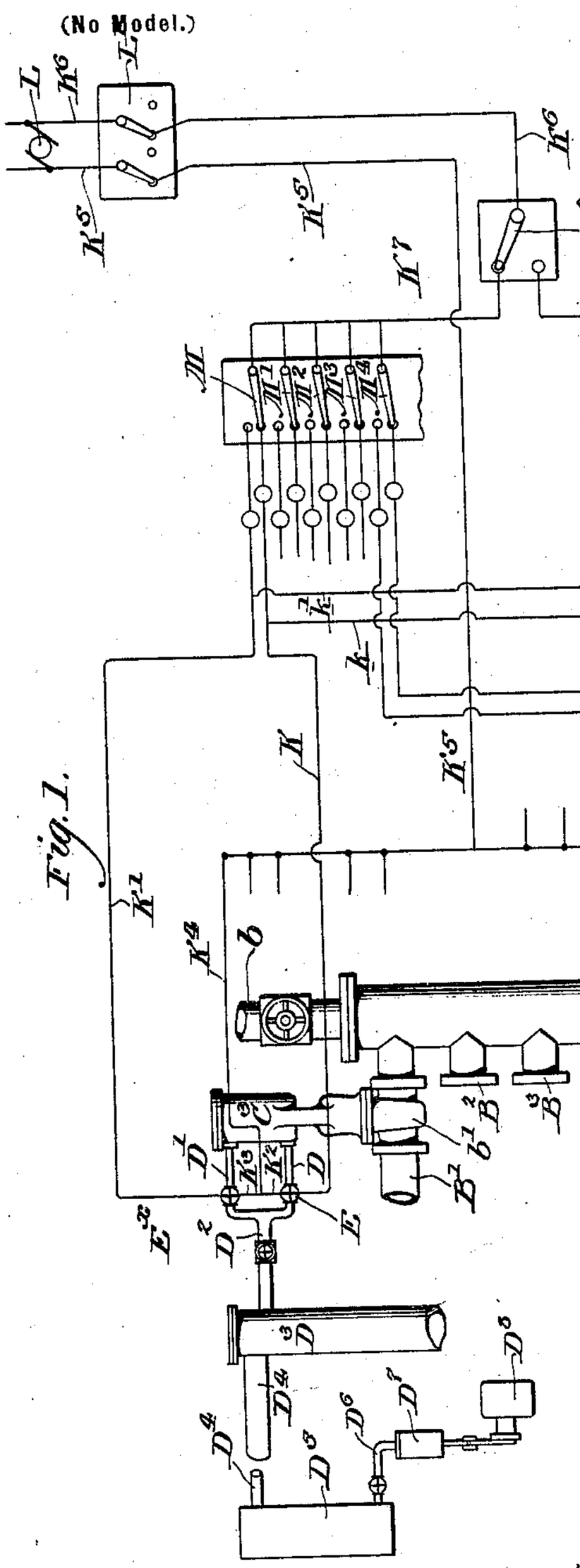


Fig. 1.

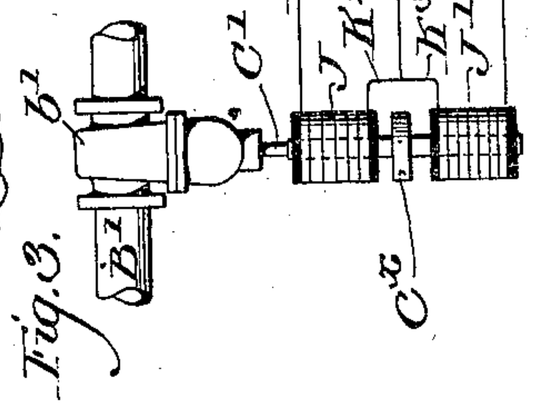


Fig. 3.

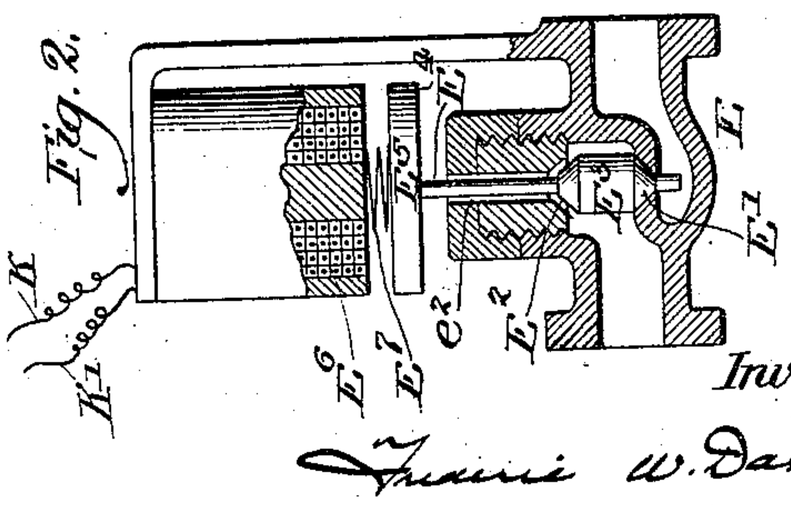


Fig. 2.

Witnesses:

Henry Tarry

F. Hewett

Inventor:

Francis W. Darlington

by his atty

Francis J. Chambers

No. 690,405.

Patented Jan. 7, 1902.

F. W. DARLINGTON.

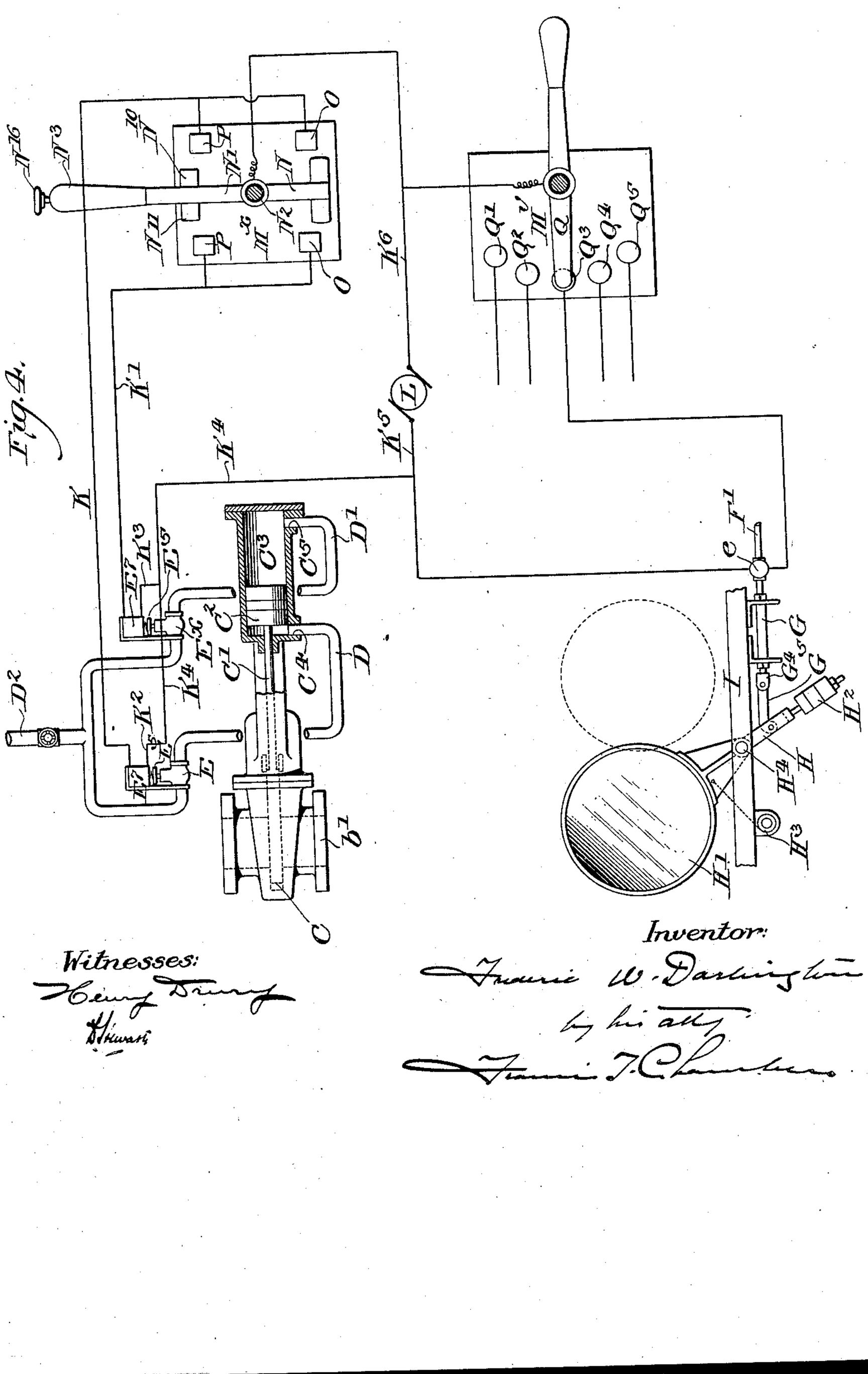
FOUNTAIN.

(Application filed May 17, 1901.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 4.



Witnesses:
Henry Dewey
H. Howard

Inventor:
Francis W. Darlington
by his atty
Francis J. Chambers

No. 690,405.

Patented Jan. 7, 1902.

F. W. DARLINGTON.

FOUNTAIN.

(Application filed May 17, 1901.)

(No Model.)

4 Sheets—Sheet 3.

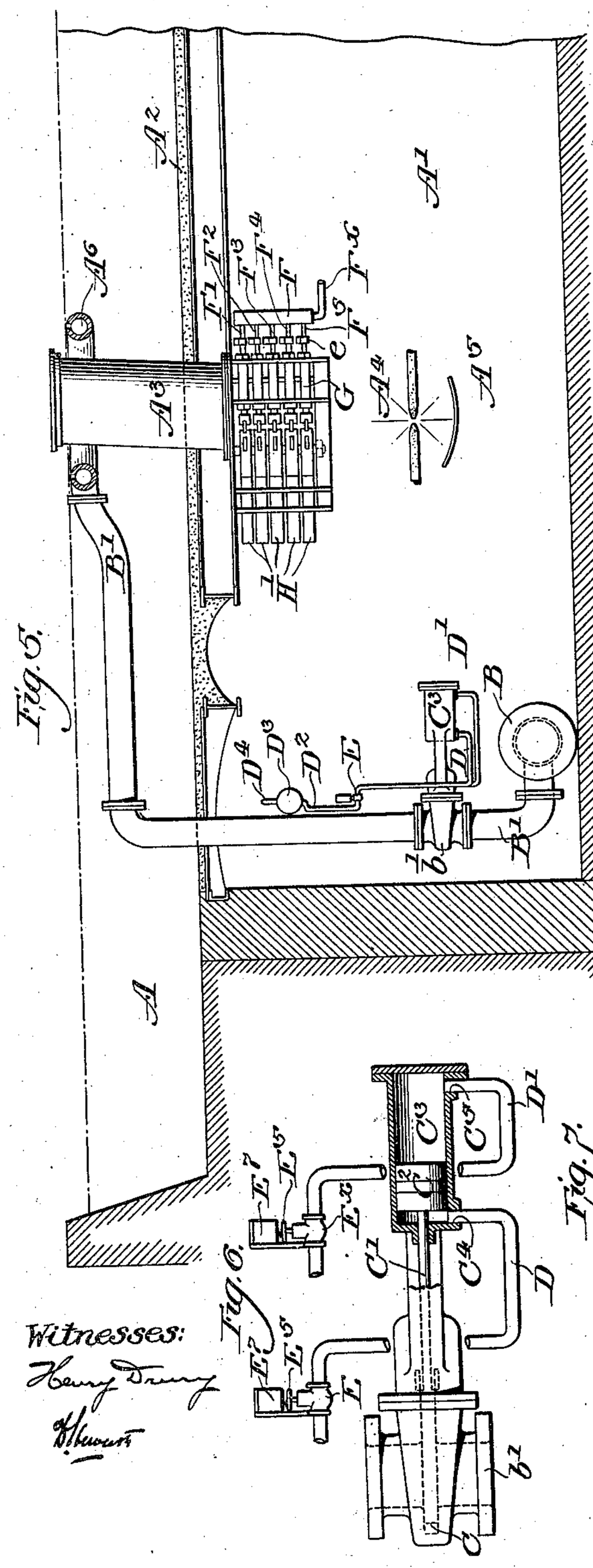


Fig. 5.

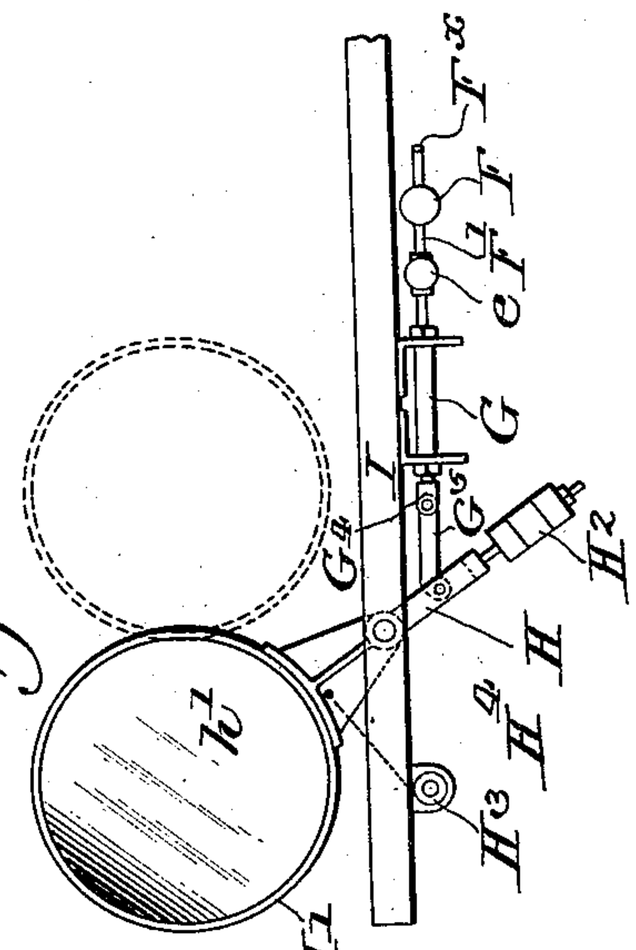


Fig. 8.

Fig. 6.

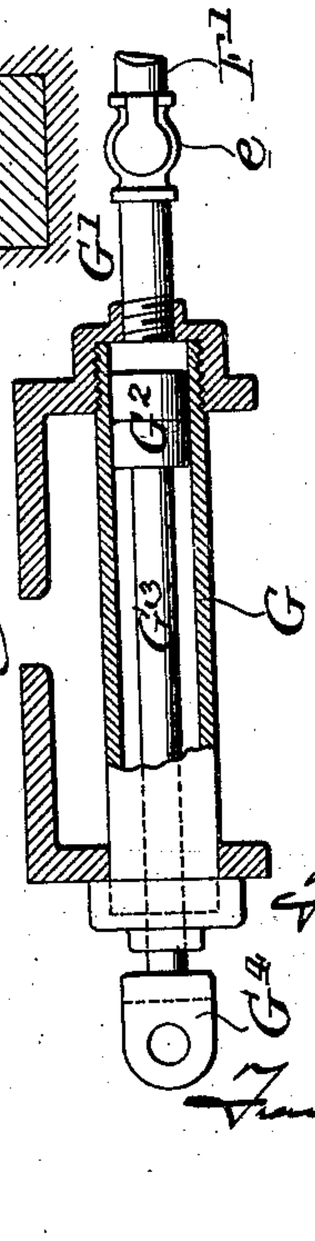


Fig. 7.

Witnesses:
Henry Drury
H. Howard

Inventor:
Francis W. Darlington
by his Atty.
Francis T. Chambers

No. 690,405. Patented Jan. 7, 1902.

F. W. DARLINGTON.

FOUNTAIN.

(Application filed May 17, 1901.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 10.

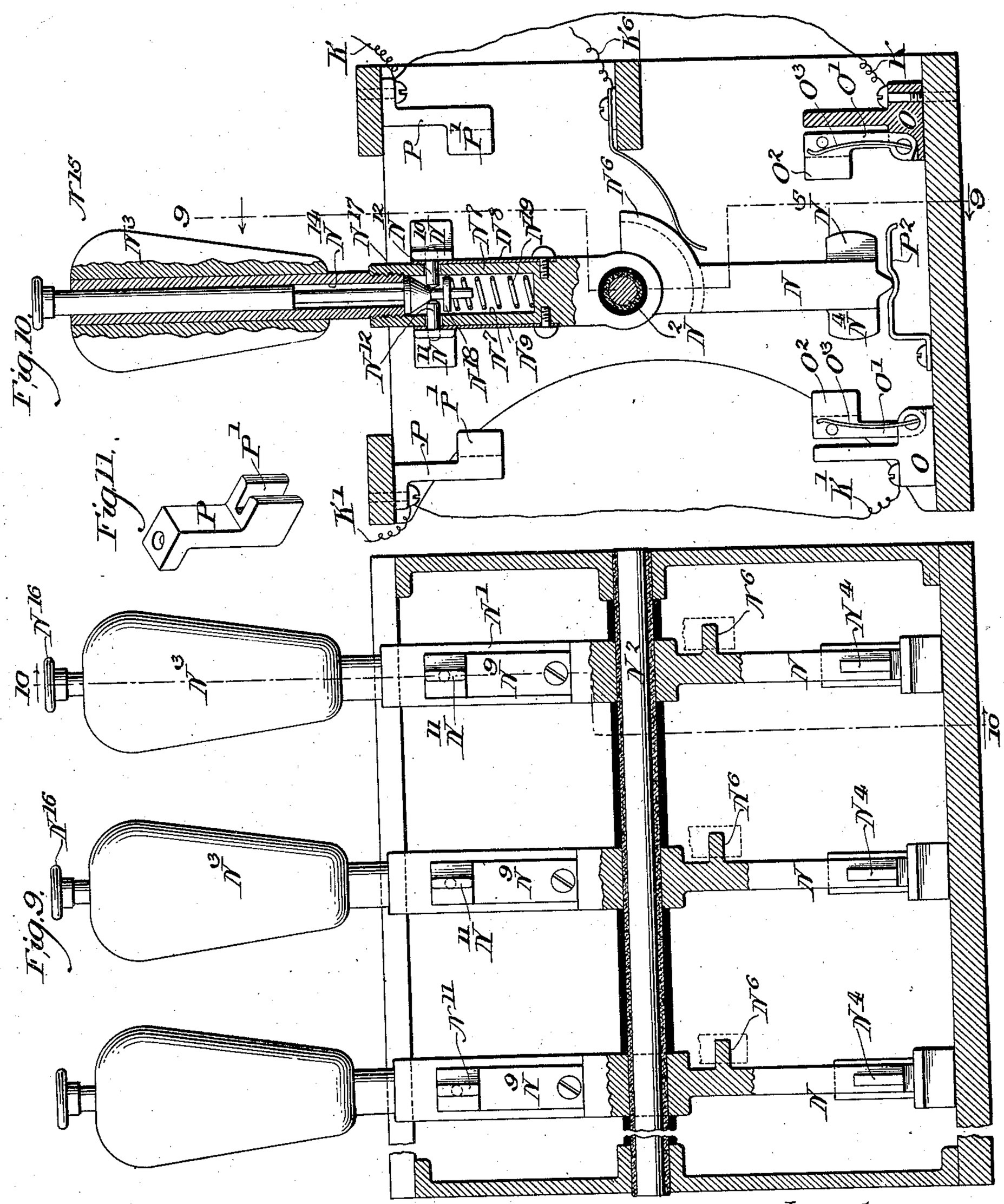


Fig. 11.

Fig. 9.

Witnesses:
Henry Dewey
H. Stewart

Inventor:
Francis W. Darlington
by his atty
Francis J. Chambers

UNITED STATES PATENT OFFICE.

FREDERIC W. DARLINGTON, OF PHILADELPHIA, PENNSYLVANIA.

FOUNTAIN.

SPECIFICATION forming part of Letters Patent No. 690,405, dated January 7, 1902.

Application filed May 17, 1901. Serial No. 60,634. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC W. DARLINGTON, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Fountains, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction and operation of fountains provided with means for changing the visual effect either by regulation of a number of jets or by throwing colored lights upon the jets, or by both such means.

The object of my invention is, primarily, to provide simple and efficient means whereby to vary visual effects with certainty and with speed, further objects of my invention being to provide efficient devices for regulating individual jets of water and for controlling the various actuating devices of independent elements of the structure.

The nature of my improvements will be best understood as described in connection with the drawings, in which they are illustrated, and in which—

Figure 1 is a diagrammatic view showing the nature of my device for arranging and throwing into operation different visual effects in the operation of a fountain. Fig. 2 is an elevation, partly in central section, of an electrically-controlled valve which I prefer to use in regulating the flow of motive fluid to the actuating-cylinders. Fig. 3 is an elevation showing an alternative device which in some cases can be used in place of the cylinders and pistons for controlling the various units of the fountain system. Fig. 4 is a diagrammatic view showing in some detail the mechanism which I prefer to use for controlling the various jets and mechanism which I prefer to use for controlling the light effects. Fig. 5 is a sectional elevation of part of a fountain equipped with my improvements. Fig. 6 is a plan view, partly in section, showing the valve controlling one of the supply-pipes for a spray-jet and the actuating mechanism connected therewith. Fig. 7 is a plan view, partly in section, of one of the cylinders used for actuating the light-screens. Fig. 8 is a plan view showing one of the light-screens and its actuating mechanism. Fig. 9 is an elevation, partly in section, on the line 9 9 of Fig. 10, showing the construction of my preferred form of switches for controlling the various individual elements of the system. Fig. 10 is an elevation, shown partly in section, on the line 10 10 of Fig. 9; and Fig. 11 is a perspective view of one of the switch-contact devices, (indicated at P P′.)

Referring first to Fig. 5, A indicates the basin of the fountain, below which is formed a chamber A′, separated from the basin by a roof A^2, which forms the bottom of the basin and through which project light-tubes, as indicated at A^3, A^4 indicating an arc-light situated in the chamber A′ beneath the tube A^3, and A^5 a reflector, while A^6 indicates an annular jet-pipe surrounding the tube A^3.

B is a water-supply chamber situated in the chamber A′ and connected with a main, as indicated at *b*, Fig. 1, the supply-chamber B having leading from it a series of pipes B′ B^2 B^3, &c., each leading to one special jet devices—as, for instance, the pipe B′ leads to the jet device A^6. In each of the jet-supply pipes is situated a valve-chamber—as indicated, for instance at *b′* b^7, Figs. 1 and 5—and in each of these valve-chambers moves a valve, as indicated at C, said valves being connected by rods C′ with pistons C^2, moving in cylinder C^3, which are preferably for my purposes double-acting cylinders C^4 and C^5, indicating the ports leading into their opposite ends and connecting through pipes D and D′ with supply-pipes D^2, which conveniently lead from chambers D^3, which are kept supplied with motive fluid, preferably air under compression—as, for instance, is indicated in Fig. 1—through a pipe D^4, leading from an air-tank D^5, supplied in turn through a pipe D^6, through a compressor D^7, actuated by a motor D^8. Situated in each of the pipes D and D′ are valve-chambers, as indicated at E and $E^\times$. These valve-chambers are provided with seats E, E′, and E^2, the admission-port leading through the seat E E′ and the exhaust-port (indicated at e^2) leading through the valve-seat E^2.

E^3 indicates a valve adapted to alternately close said ports and actuated through a stem E^4, having at its top an armature E^5, by an

electromagnet E^6, which acts to draw the valve upward, a spring or equivalent device (indicated at E^7) acting to move it in the opposite direction.

F (see Figs. 5 and 8) is a supply-box for compressed air or other motive fluid supplied through a pipe $F^\times$ and connecting through a series of individual pipes F' F^2, &c., with one end of individual single-acting cylinders G G, &c., G', Fig. 1, indicating the connection, G^2 a piston moving in the cylinder, G^3 a piston-rod connecting through a head G^4 with connecting-rods G^5, which in turn are connected to the swinging lever H, pivoted at H^4, supporting at one end the rim H', holding a colored-glass screen h', while at the other end of the lever is preferably arranged a counterweight, as indicated at H^2.

H^3 indicates a spring which normally returns and holds the screen in the position indicated in Fig. 8, the action of the cylinder G being to move it to the position indicated in dotted lines in the same figure, which position is that lying immediately below the light-tube A^3. The controlling-valve in each of the pipes F' is indicated at *e*, the valve being essentially the same, by preference, as that shown in Fig. 2 and already described. I, Fig. 8, indicates the frame upon which the cylinders G and levers H are supported.

In Fig. 3 I have shown the valve-rod C' as having attached to it an armature $C^\times$, situated between two electromagnets, (indicated at J and J',) and it is obvious that the valve-rod and attached valve will be moved to open or close the valve, in accordance with which of the electromagnets is energized, just as the valve and valve-rod are moved in the construction shown in Fig. 6, in accordance with which end of the cylinder C^3 is connected with the source of supply of the motive fluid.

The various electromagnets arranged to actuate the different valves are each connected in a circuit controlled by a switch, in accordance with the movement of which the individual electromagnet is energized or deënergized, and where the valves, such as E and $E^\times$, are used alternately the controlling-switch is preferably arranged to alternately energize and deënergize the magnets appropriate to said valves. Thus in Fig. 1 the circuit of the valve E is indicated by the lines K, K^2, K^4, and K^5 and the circuit-wires of the valve $E^\times$ by the lines K', K^3, K^4, and K^5, the line-wires K and K' having terminals which are alternately connected by a switch, as N, with the line-wire K^7, leading through a switch L^2 to the line-wire K^6, which last-mentioned wire connects through the motor L with the wire K^5 already mentioned.

All or any desired group of the actuating-magnets controlling the individual elements of the fountain are in my preferred construction connected both with a set of switches, (indicated at M and M',) and also with an independent and separate set of switches, (indicated at *m* and *m'*,) the connections being made with the latter set of switches, as indicated at *k* and *k'*, and either set of switches being connected in circuit by the action of a switch, as indicated at L^2. This arrangement enables me, while the fountain is in operation and the switch turned, for instance, in the position to couple the set of switches indicated at M M', &c., to arrange the second set of switches (indicated at *m m'*) to produce any desired visual effect in the fountain, this effect being immediately brought into operation by simply changing the switch L^3, which cuts out the first set of switches and throws into operation the second.

Where, as indicated in Fig. 5, a series of colored-light screens *h'* is arranged beneath a single light-tube A^3, a single switch is conveniently employed, as indicated in Fig. 4 at Q, to energize at will any of the electromagnets governing the various valves *e e*, &c., the switch being turned to make contact with any of the terminals Q' Q^2 Q^3, &c., and the whole group controlled by the switch being indicated in the drawings by the symbol M^b.

Where the double-acting cylinder controlled by independent electromagnetically-actuated valves is employed, it is desirable to have some convenient device for regulating the degree to which the valve controlling the water will open or close, and such a device forms one element of my invention and is illustrated in Figs. 9, 10, and 4, the switch as a whole being indicated in Fig. 4 by the symbol $M^\times$, and each of the line-wires, as K and K', leading to it having the terminals, as indicated at O and P, N indicating the switch pivoted at N^2 and having oppositely-disposed blades N^4 N^5, by which as the switch is moved in one direction or the other contact is made with one of the terminals O, the circuit being completed through the switch N by means of a segment N^6 and a spring-terminal of the line-wire K^6, as shown in Fig. 10. The upper part of the switch-lever (indicated at N') has a handle N^8, by which it is moved, said handle being, as shown in Fig. 10, separable from the switch and the upper part of the switch being hollow, as indicated at N^7, and having on each side of it spring-plates N^8 N^9, supporting contact devices N^{10} N^{11}, from the backs of which project pins N^{12}, which extend into the opening N^7, as shown. The handle N^3 has an opening extending through it, as indicated at N^{14}, in which is situated the sliding rod N^{15}, having the head N^{16} at its top and the cone (indicated at N^{17}) near its bottom, said cone being in position to act upon the pins N^{12}, and the rod and cone being normally held in their upper positions by the action of a spring N^{19} pressing against a disk N^{18} at the end of the rod N^{15}. The movement of the switch-lever to make contact with one of the terminals O does not make contact with either of the terminals P'; but when such contact is desired the operator presses down upon the head of the rod N^{15}, pushing out the terminals N^{10} and N^{11} into position to make con-

tact with the terminal P′, toward which the switch-lever is, and obviously whenever this contact is made both of the electromagnets connected with the line-wires *k* and *k′* will be energized, and thus the motive fluid introduced to both ends of the double-acting cylinder and the exhaust from both ends cut off. In this way the motion of the water-controlling valve to open or close can be arrested at will and the energy of the jet thus modified.

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

1. In combination with a fountain having a series of electromagnetic devices for changing the visual effect produced during its operation, two sets of switches connected in multiple with said devices and one switch of each set connected to actuate one of the electromagnetic devices in one direction or the other in accordance with the position of said switch, a generator having one pole connected to all the actuating devices and a switch whereby the other pole of the generator can be connected with either set of switches at will, all substantially as described, and so that any desired effect can be set up on the disconnected set of switches and brought into effect by shifting the governing-switch.

2. In a combination with a fountain having a series of water-pipes leading to jets and independently-actuatable valves for controlling the passage of water through said pipes, means for actuating said valves consisting of a double-acting cylinder and piston, said piston acting on the valve, valves controlling the admission and exhaust of the actuating fluid to the ends of the cylinder, electromagnetic means for actuating said cylinder-valves, a shifting switch whereby said valves are alternately opened and closed and an independently-actuated switching device whereby in either position of the shifting switch the closed valve can be opened and fluid admitted to both ends of the valve-actuating cylinder to arrest the piston in any desired position.

3. In combination with a fountain having a series of water-pipes leading to jets and independently-actuatable valves for controlling the passage of water through said pipes, means for actuating said valves consisting of a double-acting cylinder and piston, said piston acting on the valve, valves controlling the admission and exhaust of the actuating fluid to the ends of the cylinder, electromagnetic means for actuating said cylinder-valves, a shifting switch whereby said valves are alternately opened and closed and an independently-actuated switching device connected and moving also with the shifting switch whereby in either position of the shifting switch the closed valve can be opened and fluid admitted to both ends of the valve-actuating cylinder to arrest the piston in any desired position.

4. In combination with a fountain having a number of cylinders and pistons arranged to actuate devices for producing different visual effects, valve-casings, as E, having oppositely-disposed seats E′ E^2 and an exhaust-passage, as e^2, one or more of said casings being connected in the motive-fluid conduit or conduits of each cylinder, a valve, as E^3, adapted to alternately open and close the admission and exhaust passages in each casing, an electromagnet arranged to actuate each said valve and a series of switches controlling said electromagnets as described.

FREDERIC W. DARLINGTON.

Witnesses:
CHAS. A. MYERS,
D. STEWART.