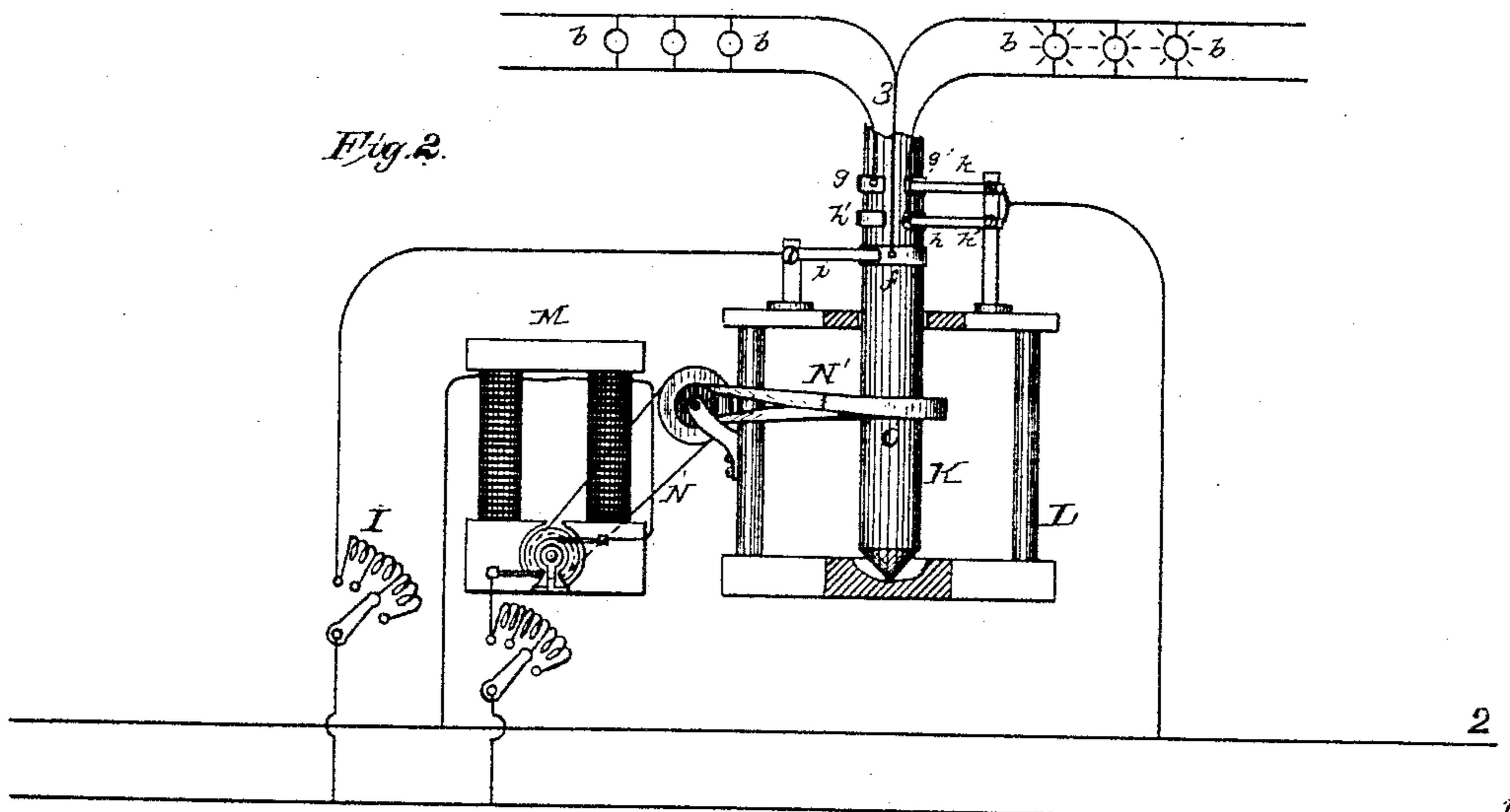
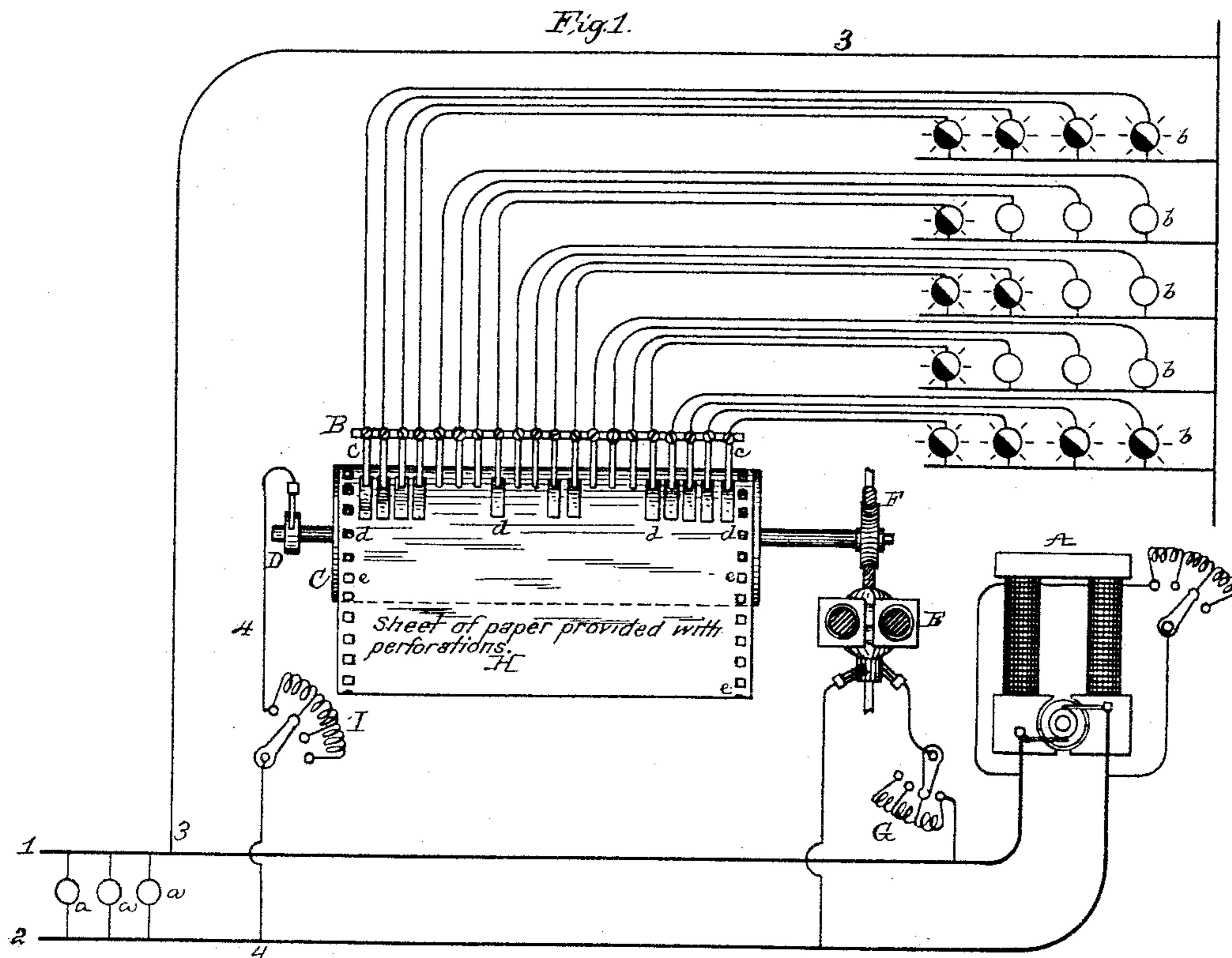


(No Model.)

E. H. JOHNSON.
ELECTRIC LIGHTING SYSTEM.

No. 449,044.

Patented Mar. 24, 1891.



ATTEST:

O. B. Rowland
Attestary

INVENTOR:

Edward H. Johnson
By Rich. H. Dyer
Atty.

UNITED STATES PATENT OFFICE.

EDWARD H. JOHNSON, OF NEW YORK, N. Y., ASSIGNOR TO THE EDISON
GENERAL ELECTRIC COMPANY, OF SAME PLACE.

ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 449,044, dated March 24, 1891.

Application filed January 10, 1884. Serial No. 117,047. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. JOHNSON, of New York city, in the county and State of New York, have invented a certain new and useful
5 Improvement in Utilizing Electric Light for Ornamental and Advertising Purposes, of which the following is a specification.

The object of this invention is to utilize electric lamps, preferably of the incandescent
10 type, for ornamental and advertising purposes and for displays of various kinds, and I accomplish this by the use of means for automatically controlling the circuits leading to a number of lamps, so as to place lamps in
15 circuit in such numbers and such relative arrangement that the lamps in operation will form characters, figures, designs, or pictorial representations, or will produce such visual or spectacular effect as may be desired for any
20 purpose.

In carrying out the invention I employ automatically-operating circuit-controlling devices which at the proper moment close circuit to those lamps whose relative position is
25 such as to produce the configuration or effect desired, and the letter, number, figure, or other design will thus be formed in lines of light. A large number of lamps are preferably massed together, each having a separate
30 circuit, and by the operation of the circuit-controllers the number and position of the lights in circuit may be changed first in one way and then in another, the variety of combinations which can be formed being infinite.

For advertising purposes the name of the advertiser or of the article advertised may be brought out by closing circuit to the proper lamps, or the name may be spelled out, one
35 letter appearing at a time, or parts of letters being placed in view one after another, the preceding parts remaining in circuit, the appearance of gradual writing upon a wall or elsewhere will be produced, or views or pictures may be gradually traced in a similar
40 manner. After one advertisement has been displayed the circuits of other lamps may be closed to form some other combination of letters or characters. It can readily be imagined what brilliant and conspicuous effects are pro-
45 duced by the flashing out in incandescent characters of the words displayed.

For ornamental displays the circuits may be arranged to produce portraits or views of any kind or ornamental designs, each of which would be displayed for a time and then re-
55 placed by another. The "set pieces" shown in pyrotechnic exhibitions can be produced in this way with equally brilliant effect and without the danger of fire-works.

In many cases it is preferable to have the
60 globes of the lamps used of various colors, the beauty and conspicuousness of the displays being heightened by the alternating, contrasting, or harmonizing of the different colors used, and where pictures or views are
65 displayed the colors appropriate to the different parts of the view are shown. Very small lamps placed close together may be used where designs requiring distinctness of outline are shown, and the size of the lamps and
70 their distance apart are varied for the different uses of the invention; or lamps of large and small candle power can be used in the same bank of lamps by a proper arrangement of circuits.

By the use of adjustable resistances the in-
75 tensity of the light is varied, and the design may be increased or reduced in brilliancy at pleasure. It may be first produced faintly and then gradually increased in brightness,
80 or vice versa. For stage effects—such as the imitation of supernatural or visionary appearances—this feature is one of great advantage.

In connection with the circuit-breaking apparatus for varying the relation of the lamps
85 I may also employ means for revolving or otherwise changing the position of all the lamps. The number of effects which can be produced by the stationary lamps can thus be indefinitely multiplied. The lamps may,
90 for instance, be arranged on a revolving structure and the circuit-controllers so placed that the lamps on each part will flash into incandescence as that part comes into view. Show-cases for shop-windows may readily be
95 arranged in this way, and it is exceedingly appropriate for Christmas-trees and similar ornamental displays, as a continual flashing and appearance and disappearance of lights
100 of various colors and intensities may be produced in the different portions of the structure illuminated.

Convenient apparatus for carrying the invention into effect is illustrated in the annexed drawings.

Figure 1 shows, partly in diagram, means for producing designs or characters in a stationary bank of lamps; and Fig. 2 illustrates the application of the invention to a revolving structure.

I have shown the invention in connection with a multiple-arc system of electrical distribution, A being the generator, 1 2 the main conductors leading therefrom, and *a a* the ordinary translating devices of the system. It is evident, however, that the supply of electricity may be from any other convenient source.

Referring to Fig. 1, a number of incandescent electric lamps *b b* are massed together in a convenient position where they can be conspicuously displayed. One terminal of each lamp is connected to the common return-conductor 3, which leads to the main conductor 1. The other terminal of each lamp is connected to one of the spring-fingers *c c*, which are secured upon the insulating-base B. The spring-fingers *c c* rest upon a metallic cylinder C, from whose shaft D the conductor 4 leads to main conductor 2. The lamps *b* are thus arranged in separate multiple-arc or derived circuits.

The cylinder C is revolved through worm-gearing F by an electro-dynamic motor E, connected in multiple arc with the main conductors and provided with an adjustable resistance G, by varying which the speed of rotation of the cylinder C is regulated. Upon said cylinder, between it and the spring-fingers *c*, I place a sheet of paper H, which of course breaks the circuits to all the display-lamps *b*; but the sheet is provided with perforations *d d*, like the sheets used with the mechanical arguinettes commonly in use, arranged to pass under those spring-fingers which connect with the lamps whose position is such as to produce the desired design.

As shown, the apertures are so arranged as to produce the capital letter "E," the lighted lamps being indicated by the surrounding rays. The apertures *e* near the edges of the sheet catch upon pins on the cylinder, so that the paper is kept straight thereon. The sheet of paper may be provided with several series of apertures differently arranged, so that as the cylinder revolves one design after another will be produced among the lamps *b*; or the same design may of course be repeated as many times as desired, and after one sheet is exhausted others provided with different designs may be placed in position. These designs may be exceedingly simple or of the most elaborate and complicated character. The entire number of display-lamps employed would of course be suited to circumstances. It is evident that hundreds or thousands of them may be used, if desired.

Instead of employing the perforated sheet of paper on the metallic cylinder, the cylinder

itself might instead be provided with points or projections making contact with terminals of the display-lamp circuits at the proper moment; or any similar means for automatically completing the circuits may be employed.

I is an adjustable resistance which may be employed, if desired, to vary the intensity of the display-lamps. The design may be first produced with the resistance all in circuit, and while such design is in view the resistance will be gradually cut out, when the lamps will gradually increase in brilliancy.

In Fig. 2, K is a revolving stem, which is supported in a suitable frame L, and which may support any structure to be illuminated or on which the effects are to be displayed. The stem K is revolved from the electric motor M through belts N and N', the latter passing over a wheel O on said stem, or the connection between the motor-armature and the stem may be made in any other suitable manner. The motor is provided with a speed-regulating resistance, as before.

Upon the stem K is placed an encircling metallic collar *f* and two collars *g g'* and *h h'*, neither of which completely encircles the stem, they being each broken at two points opposite each other.

The display-lamps *b b* are shown as divided between two circuits having the common return-wire 3, which is connected with the complete collar *f*. The opposite wire of one circuit is connected with the half-collar *g* and that of the other with the half-collar *h*. A contact-spring *i* bears on collar *f* and a conductor extends therefrom to main conductor 1, and contact-springs *k k'* bear on the half-collars, both being connected with main conductor 2. As the stem revolves, the two circuits are closed alternately, and the lamps are thrown into operation first on one side and then on the other. A good effect is produced by having the lamps in the two circuits of different colors.

It is evident that the lamps may be divided among any number of circuits, each having its automatic circuit-controller.

The resistance I for varying the intensity of the display-lamps may be used, if desired.

It is evident that many modifications of the various apparatus above described may be employed without departing from the spirit of my invention. The devices shown, being convenient ones for the purpose, are intended to illustrate the principle of the invention.

What I claim is—

1. The combination of a main circuit, a number of electric lamps divided between two or more multiple-arc branches of said circuit, a circuit-controller in said branches, having contacts arranged in a predetermined order for making and breaking the several branches to produce the desired visual effects, and an electric motor, also connected with the main circuit, for operating the circuit-controller, substantially as described.

2. The combination of a main circuit, a number of electric lamps divided between two or more branches of the main circuit and mounted on a suitable structure, an electric motor for revolving the structure, also connected to the main circuit, and an automatic circuit-controller or switch moved by the motor for throwing the lamps into and out of circuit in a predetermined order, substantially as described.

3. The combination of a number of electric lamps divided between two or more circuits, a revolving cylinder, an electric motor for revolving such cylinder, and circuit-controlling devices operated automatically by the revolution of such cylinder for closing circuit to such lamps as will produce the desired visual effect, substantially as set forth.

4. The combination of a number of electric lamps divided between two or more circuits, a revolving cylinder, means for revolving the cylinder, circuit-controlling devices operated automatically by the revolution of such cylinder for closing circuit to such lamps as will

produce the desired visual effects, and means for varying the intensity of the lamps in circuit, substantially as set forth.

5. The combination of a revolving structure carrying electric lamps divided between two or more circuits, and circuit-controllers operated by the movement of said structure for automatically closing circuit to such lamps as will produce the desired visual effect, substantially as set forth.

6. The combination of a revolving structure carrying electric lamps divided between two or more circuits, an electric motor revolving such structure, and circuit-controllers operated by the movement of such structure for closing circuit to such lamps as will produce the desired visual effect, substantially as set forth.

This specification signed and witnessed this 8th day of November, 1883.

EDWARD H. JOHNSON.

Witnesses:

H. W. SEELY,

EDWARD H. PYATT.