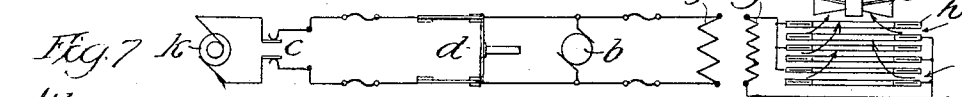
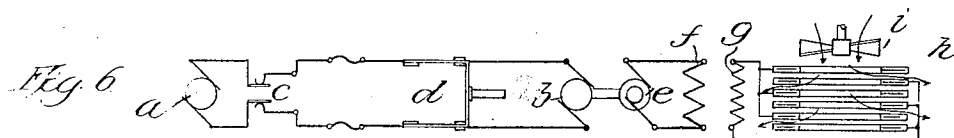
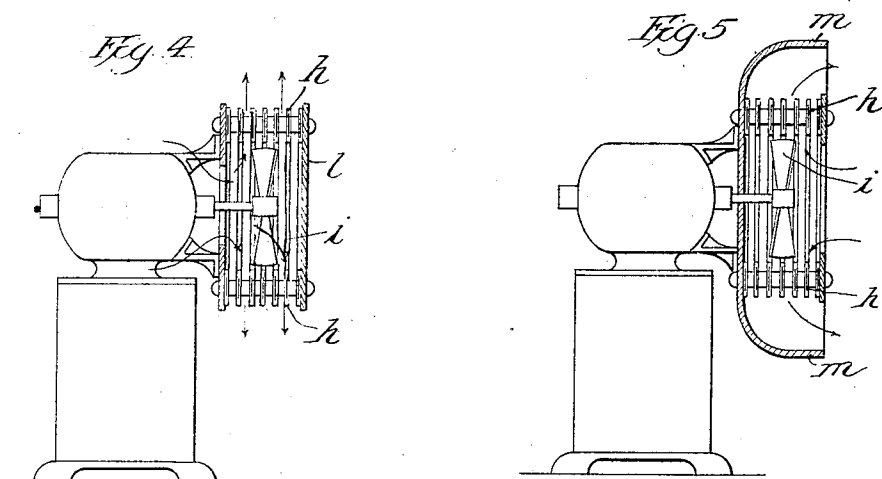
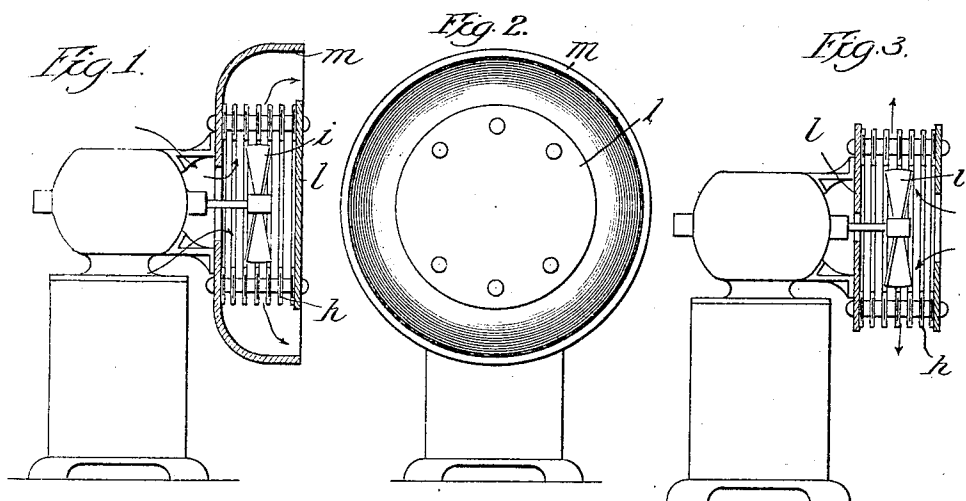


R. SPAULDING,
 APPARATUS FOR PRODUCING ELECTRICAL DISCHARGES.
 APPLICATION FILED JUNE 27, 1910. RENEWED FEB. 17, 1913.

1,060,957.

Patented May 6, 1913.



Witnesses:

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APPARATUS FOR PRODUCING ELECTRICAL DISCHARGES.

1,060,957.

Specification of Letters Patent.

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Application filed June 27, 1910, Serial No. 568,987. Renewed February 17, 1913. Serial No. 749,026.

To all whom it may concern:

Be it known that I, RUSSELL SPAULDING, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Apparatus for Producing Electrical Discharges, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to apparatus for establishing electrical discharges between spaced apart electrodes and has a number of objects and advantages in view.

In practising my invention, I preferably cause the electrodes of both signs to remain stationary and distribute these electrodes about a central passage through which air or other fluid which is to be subjected to electrical discharges is passed, and which air or other fluid has opportunity to impinge upon the electrodes. In the preferred embodiment of the invention, the electrodes, as well as being fixed, are located in planes transverse to the direction of the channel so that electrical discharges are effected in directions substantially parallel to the direction of the channel, spaces intervening between the electrodes to permit air to pass therebetween in directions transverse to the direction of said central air passage, by which arrangement the air or other fluid passing between the central passage and the exterior of the electrodes is subjected to the action of electrical discharges.

I will explain my invention more fully by reference to the accompanying drawing showing the preferred embodiment thereof, in which—

Figure 1 is a view of one form of the apparatus constructed in accordance with the invention, a portion being shown in full elevation and a portion in section; Fig. 2 is a front view of the apparatus shown in Fig. 1; Fig. 3 is a view in elevation, partly in section, of a modification of the structure shown in Figs. 1 and 2; Fig. 4 is a view in elevation, partly in section, of another modification; Fig. 5 is a view in elevation, partly in section, of another modification; Fig. 6 is a diagrammatic view illustrating one circuit arrangement; and Fig. 7 is a diagrammatic view illustrating another circuit arrangement.

Like parts are indicated by similar characters of reference throughout the different figures.

Referring first to the system shown in Fig. 6, I have there shown a main generator *a* that produces direct current which may be included in circuit with the motor *b* by means of a plug switch *c* and a knife switch *d*. The motor *b* operates a wave form current generator *e* that desirably produces alternating current and which is included in closed circuit with the primary winding *f*. The secondary *g* that is in inductive relation with the primary *f* constitutes the preferred source of wave form current that is directly connected with the electrodes *h* for the purpose of occasioning electrical discharges therebetween. Where direct current is the initial source of power that is available, the motor *b* not only operates the wave form current generator *e* but also drives a fan *i* or other means for effecting forced passage of air or other fluid through the spaces between the electrodes, in order that such air or other fluid may be subjected to electrical discharges occurring between the electrodes.

In the arrangement shown in Fig. 7, the prime source of current *k* is an alternating current generator which is shown as being directly connected with the terminals of the primary coil *f* by means of the plug switch *c* and the knife switch *d*, the wave form generator driven by the motor *b* being omitted in the system shown in Fig. 7. The secondary *g*, in the system shown in Fig. 7, is in suitable transformer ratio with the primary *f* and is directly connected with the electrodes *h* in order that electrical discharges may be effected between said electrodes.

In each of the instances illustrated in the drawing, each electrode *h* is in the form of an annulus and the electrodes are collected together in each apparatus so as to have a common axis concentric with respect thereto. Thus, the electrodes are distributed about a space, and while each electrode is preferably an endless ring, I do not wish to be limited to this characteristic. The motor *b* in each equipment operates a fan *i* that may be located in any desired position, the function of this fan being to effect forced passage of air or other fluid through the space surrounded by the electrodes, which electrodes occupy planes transverse to the

general direction of the space surrounded by the electrodes and which therefore define avenues of communication between the space inclosed by the electrodes and the space surrounding the electrodes, which avenues of communication occupy planes parallel to the planes occupied by the electrodes, and therefore planes which are transverse to the general direction of the continuous space or main channel surrounded by the electrodes. The spaces between the electrodes are each in communication at one termination with the main channel and at its other termination with the external air so that the air passing through the main channel is divided into parallel streams that do not directly return to the main channel whereby each unit of air after having once been ozonized is not again subjected to further ozonization. As the air or other fluid passes between the electrodes, either from the outside to the space surrounded by the electrodes or from the space surrounded by the electrodes to the exterior of the electrodes, it divides into parallel streams that are separated by the electrodes and which are subjected to discharges occurring between the electrodes.

By my construction, an apparatus of high efficiency within small compass is secured.

In the arrangement shown in Fig. 1, the fan *i* is a centrifugal fan and operates to draw air into the space surrounded by the electrodes, and the plate *l* serves to limit the direction of the incoming air to the direction from the motor toward the fan. A deflector *m* serves to give desired direction to the air or other fluid issuing from between the electrodes after it has been subjected to the action of electrical discharges occurring between the electrodes. In the equipment shown in Fig. 3, the fan *i* operates to draw air into the space surrounded by the electrodes in a direction opposite to that in which the air is drawn into the corresponding space existing in the equipment of Fig. 1, the wall *l* being reversely located. The equipment shown in Fig. 4 is like that exhibited in Figs. 1 and 2 with the exception that the deflector *m* is absent. The equipment shown in Fig. 5 is like that shown in Fig. 3 except that the deflector *m* having the function of the deflector illustrated in Fig. 1 is present. In each of the equipments shown in Figs. 1 to 5 inclusive and in the diagrammatic illustration shown in Fig. 6, the air is received into the space surrounded by the electrodes before it is subjected to electrical discharges, but it is obvious that the direction of the flow of the air may be reversed so that the air will be received from the space surrounding the electrodes before it is subjected to separate electrical discharges and may find egress after being subjected to separate electrical

discharges through the space surrounded by the electrodes, and such reversal in the direction of the air is diagrammatically illustrated in Fig. 7. With either arrangement the passage is free at one termination from direct communication with said channel except by means of such passage whereby the fluid flowing in each passage having once been subjected to electrical discharge is not subject to further electrical discharge before it is passed from the apparatus.

As will appear from the description and illustration of my invention, electrodes are disposed in parallel planes that are perpendicular to the general direction in which a stream of air or other fluid is caused to flow in order that branching streams of air or other fluid may pass between the electrodes in planes that are perpendicular to the general direction of the main body of air or other fluid either before or after being subjected to electrical discharges, and while I prefer to cause the electrodes to surround a space in which the main body of air or other fluid is caused to pass, I do not wish to be limited to this characteristic in all embodiments of my invention.

While I have herein shown and particularly described the preferred forms of my invention, I do not wish to be limited to the precise details of construction shown, as changes may readily be made without departing from the spirit of the invention, but.

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

1. An apparatus for producing electrical discharges, including a main channel for the passage of air or other fluid; spaced apart electrodes distributed about said channel in planes transverse to the general direction of said channel and thereby affording passages for the air or other fluid that are in planes transverse to the general direction of said channel, each said passage being free at one termination from direct communication with said channel except by means of such passage whereby the fluid flowing in each passage after having once been subjected to electrical discharge is not subject to further electrical discharge before it is passed from the apparatus; and means for forcing the passage of the air or other fluid through said channel.

2. An apparatus for producing electrical discharges, including a main channel for the passage of air or other fluid; spaced apart electrodes disposed in planes transverse to the general direction of said channel and thereby affording passages for the air or other fluid that are in planes transverse to the general direction of said channel, each said passage being free at one termination from direct communication with said chan

nel except by means of such passage whereby the fluid flowing in each passage after having once been subjected to electrical discharge is not subject to further electrical
5 discharge before it is passed from the apparatus; and means for forcing the passage of the air or other fluid through said channel.

In witness whereof, I hereunto subscribe my name this 24th day of June, 10 A. D., 1910.

RUSSELL SPAULDING.

Witnesses:

G. L. CRAGG,
R. E. ATHERTON.