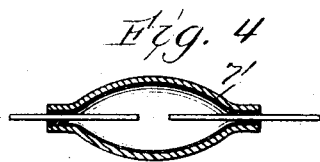
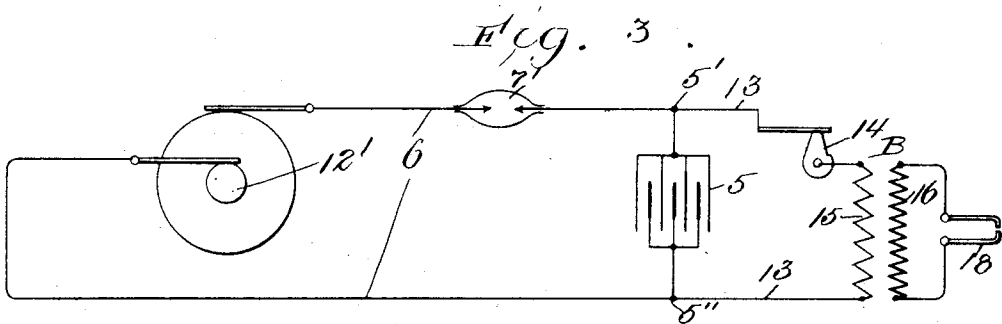
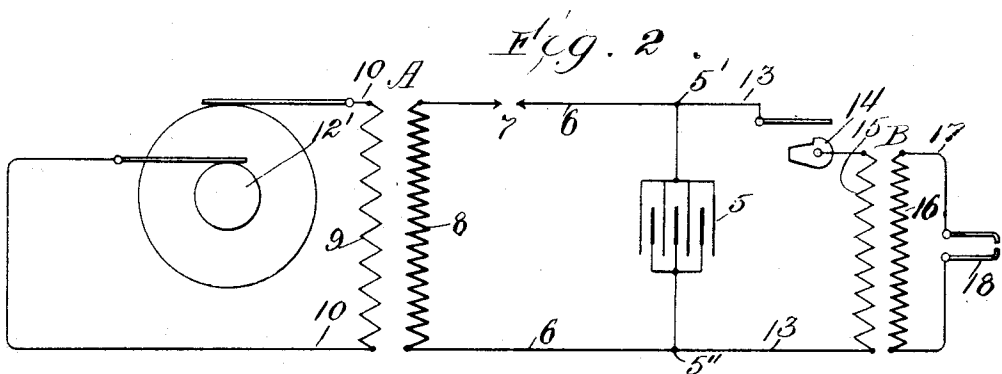
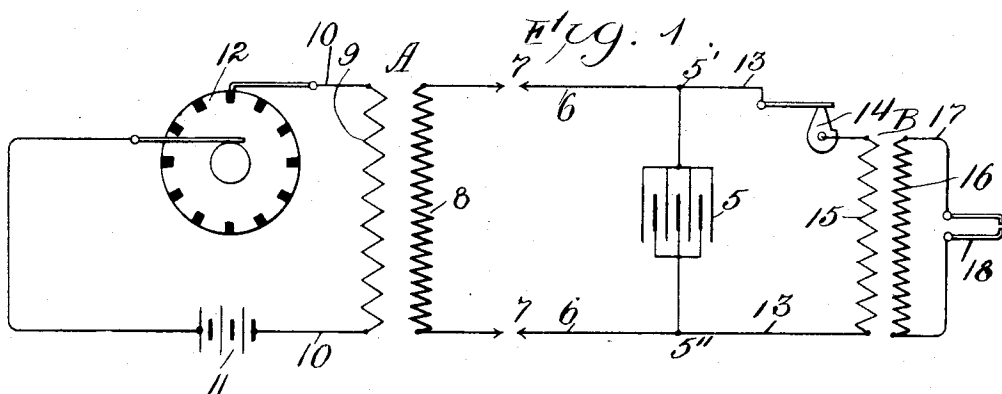


V. G. APPLE.
SYSTEM OF ELECTRICAL DISTRIBUTION.
APPLICATION FILED FEB. 18, 1904.



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UNITED STATES PATENT OFFICE.

VINCENT G. APPLE, OF DAYTON, OHIO.

SYSTEM OF ELECTRICAL DISTRIBUTION.

SPECIFICATION forming part of Letters Patent No. 791,856, dated June 6, 1905.

Application filed February 18, 1904. Serial No. 194,185.

To all whom it may concern:

Be it known that I, VINCENT G. APPLE, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and
5 useful Improvements in Systems of Electrical Distribution; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.
10

My invention relates to systems of electrical distribution, and has for its primary object to provide a system wherein is employed a condenser having one path or circuit for discharge
15 and another path or circuit for the charging thereof so devised that the condenser cannot discharge through its charging-path.

A further object is to provide a system wherein a condenser adapted to effect its discharge through one circuit is so associated
20 with a charging path or circuit that alternating electrical impulses occasioned or created in the charging-circuit will be accumulated in the condenser until discharged through the
25 discharging-circuit.

Another object of my invention is to provide a system having the characteristics above set forth particularly adapted for producing
30 a flame in working devices associated with the path or circuit of discharge of the condenser.

With a view to attaining these and further objects, which will be apparent to those skilled in the art from the following description, my invention consists in the provision of a system
35 embodying a condenser, a path or circuit for charging the condenser having one or more gaps therein to prevent the discharge of the condenser through the charging-path, means for occasioning electrical impulses in the
40 charging-circuit to charge the condenser, and another path or circuit for the discharge of the condenser.

My invention further consists in associating with the path or circuit of discharge of the condenser in a system characterized by the
45 features above set forth working devices requiring for their efficient operation a momentary current of high potential, a characteristic form of such working devices herein se-

lected as illustrative being a jump-spark plug 50 of a gas-engine ignition system.

My invention further consists in the features of arrangement and combination of parts hereinafter more fully described, and set forth in the claims.
55

Figures 1, 2, and 3 each represent diagrammatically the association of devices to effect an operative embodiment of my invention, the various embodiments differing only in the selection of equivalent means for attaining the
60 end sought by my invention; and Fig. 4 is a detail of construction embraced in the embodiment of the invention shown in Fig. 3.

In all of the views the system is shown as adapted for producing a flame in the spark-
65 plug of a jump-spark ignition device such as is commonly employed in gas-engines; but my system may obviously be adapted for many other purposes.

Referring to the drawings, wherein like numerals of reference refer always to like parts, 5 indicates a condenser having terminals 5' and 5''. A path for charging the condenser is provided by a broken circuit 6, having therein one or more constant openings of gaps
70 7 and including the secondary 8 of a transformer or induction-coil A. 9 indicates the primary of said transformer A included in a circuit 10, which also includes a source of electrical supply, such as a battery 11, and a
75 constantly-operating circuit-breaker 12 of an approved pattern.

Connected with the terminals 5' and 5'' of the condenser 5 I also provide a path for the discharge of the condenser independent of the
80 charging-path, such path of discharge comprising a circuit 13, with which are suitably associated devices for utilizing the effect of the discharge of the condenser. In an ignition system such devices preferably comprise a
85 means for opening and closing the circuit, such as a mechanical circuit breaker and maker 14, adapted to momentarily close the circuit at suitable intervals, and the primary 15 of a transformer or induction-coil B. The secondary 16 of said coil B is included in what I
90 will term the "working circuit" 17, which also includes the separated contact-points of a

spark-plug 18. The mechanical and electrical devices described are all of well-known construction, and any suitable devices may obviously be employed as substitutes for those suggestively shown. It will be apparent, too, that for many purposes a transformation of the current from the condenser may be unnecessary, and the working devices may then be included directly in the discharging-circuit.

In operation the current flowing in the circuit 10 being interrupted by the mechanical interrupter or circuit-breaker 12 produces in the primary 9 of the induction-coil A intermittent impulses which induce in the secondary 8 of said transformer A alternating electrical impulses. The electrical proportioning of the devices is such that the impulses thus produced in the secondary winding 8 of the transformer A are sufficient to jump the gap or gaps 7. I have found by experiment that under these conditions the condenser accumulates and retains a powerful charge, and I have further found that the condenser will not discharge back through the charging-circuit if a gap or gaps be provided therein. I have also found that when the path of discharge through the circuit 13 is closed by the circuit-closer 14 at intervals comparatively long relative to the frequency of the alternations in the charging-circuit the discharge of the condenser through such circuit is very powerful. The discharge in the present illustrative embodiment is utilized in the working circuit 17, each discharge of the condenser producing an impulse in the secondary 16 of the induction-coil B which causes a flame to jump the gap between the points of the plug 18.

It will be apparent that the discharge of the condenser might be utilized in various ways, and while I claim the particular ignition system herein suggested as new and useful I do not desire to limit myself thereto, as the essence of my invention may obviously be applied to any use where it is desired to secure from the condenser a powerful discharge for any purpose. It will also be apparent that other means than those heretofore described might be employed to produce impulses in the charging-circuit, and I have illustrated in Fig. 2 a form of apparatus substituting for the battery 11 and interrupter 12 of the circuit 10 an alternating generator 12'. It will be apparent that the alternator producing alternating impulses in the primary 9 of transformer A will induce alternating impulses in the secondary 8 of said transformer, so that the effect upon the condenser will be that heretofore described.

In Fig. 3 I have shown another modification to secure the same result, the alternator 12' being included directly in the charging-circuit 6. This arrangement is of course dependent upon the ability of the alternator to

supply a current of sufficiently high potential to jump the gap or gaps 7; but I have found that in practice this arrangement may be successfully employed.

To reduce the resistance of the gap 7, the separated points may be inclosed in a vacuum-chamber 7', so that the discharge takes place in a partial vacuum, which, it is well known, offers much less resistance to the passage of a spark than an air-gap.

While I have herein for purposes of full disclosure illustrated and described several embodiments of my invention, I do not desire to be understood as limiting myself to the same, as such modifications are herein shown merely for the purpose of illustrating the fact that my invention is susceptible of wide application and may be variously applied without departing from the spirit and scope thereof.

What I claim, therefore, and desire to secure by Letters Patent of the United States, is—

1. In a system of electrical distribution, a condenser, paths for charging and discharging the condenser, the charging-path having a constant gap therein through which the condenser cannot discharge, and means for creating electric current in the charging-circuit capable of jumping the gap and charging the condenser.

2. In a system of electrical distribution, a condenser, paths for charging and discharging the condenser, the charging-path having constantly a gap therein through which the condenser cannot discharge, a circuit make-and-break device in the discharging-path, and means for creating electric impulses in the charging-circuit capable of jumping the gap and charging the condenser.

3. In a system of electrical distribution, a condenser, a path or circuit for charging the condenser providing a constantly open gap through which the condenser cannot discharge, a means for creating electrical impulses in said path of sufficiently high potential to jump the gap, a path or circuit for discharging the condenser including a circuit maker and breaker, and working devices operatively associated with the discharging-circuit to utilize the discharge of the condenser.

4. In a system of electrical distribution, a working circuit, including the winding of a transformer and working devices, a condenser, a path for the discharge of the condenser including another winding of said transformer, and a circuit-closer, a path for charging the condenser having a gap therein through which the condenser cannot discharge, and means for creating electrical impulses in the charging-path of the condenser capable of jumping the said gap.

5. In a system of electrical distribution, a condenser, a path or circuit for charging the condenser having a gap therein through which

the condenser cannot discharge, means for creating electrical impulses in the charging-path capable of jumping said gap, a path or circuit for the discharge of the condenser, a circuit-closer in said path, a working circuit, an ignition device in said working circuit, and a transformer having one winding included in said working circuit and another winding included in the path of discharge of the condenser.

6. In a system of electrical distribution, a condenser, a path or circuit for charging the condenser having a constant gap therein

through which the condenser cannot discharge, means for creating alternating electrical impulses in the charging-path capable of jumping said gap, and a path or circuit for the discharge of the condenser.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

VINCENT G. APPLE.

In presence of—

GEORGE S. MAY, Jr.,

MARY F. ALLEN.