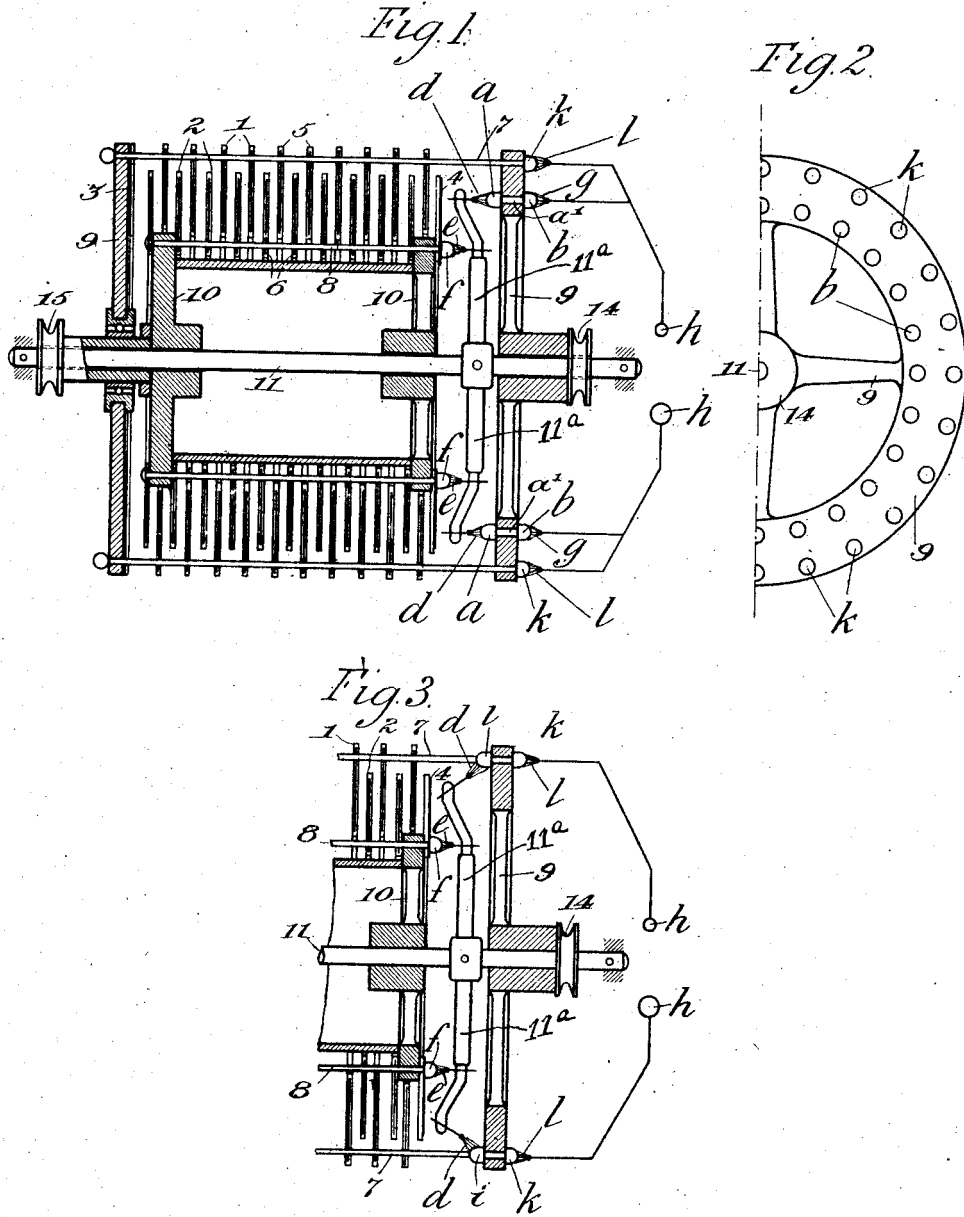


H. WOMMELSDORF.  
ELECTRICAL MULTIPLE INFLUENCE OR CONDENSER MACHINE.

APPLICATION FILED FEB. 28, 1905.

3 SHEETS—SHEET 1.



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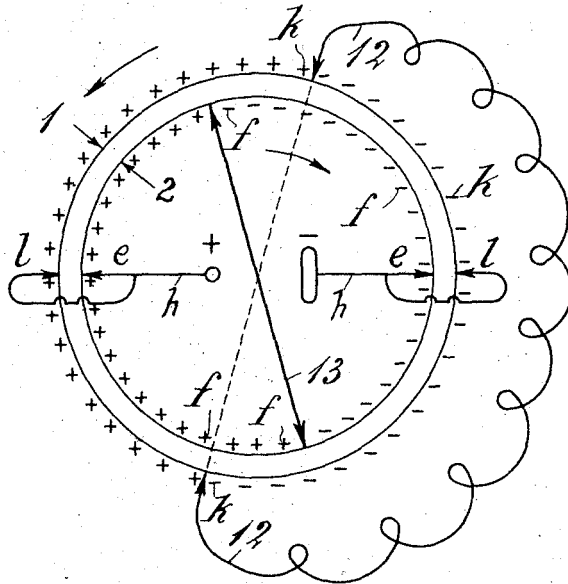
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3 SHEETS—SHEET 2.

*Fig 4.*



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3 SHEETS—SHEET 3.

Fig. 5.

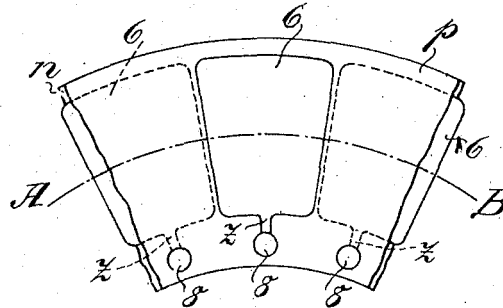


Fig. 6.

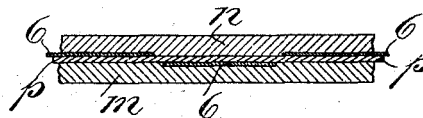


Fig. 7.

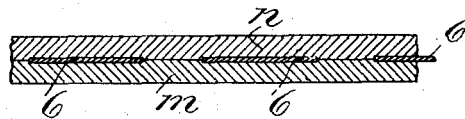


Fig. 8.

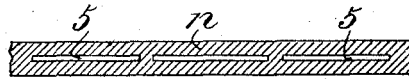
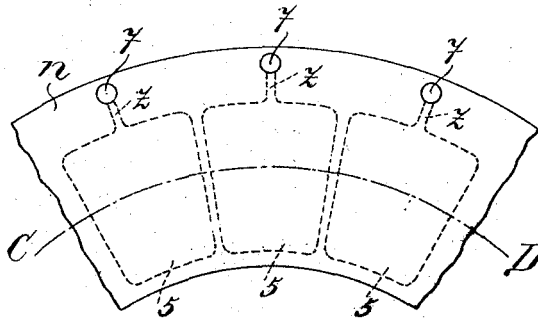


Fig. 9.



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# UNITED STATES PATENT OFFICE.

HEINRICH WOMMELSDORF, OF CHARLOTTENBURG, GERMANY.

ELECTRICAL MULTIPLE INFLUENCE OR CONDENSER MACHINE.

No. 883,846.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed February 28, 1905. Serial No. 247,717.

To all whom it may concern:

Be it known that I, HEINRICH WOMMELSDORF, a subject of the Emperor of Germany, residing at No. 65 Schlüterstrasse, Charlottenburg, near Berlin, in the German Empire, engineer, have invented certain new and useful Electrical Multiple Influence or Condenser Machines, of which the following is a specification.

My invention relates to multiple influence or condenser-machines, having disks or plates rotating in opposite directions and has for its purpose to increase the tension or the length of the spark of this type of condenser machines.

Multiple influence or condenser machines are advantageously made with two sets or systems of disks revolving in contrary directions, and if, as in known constructions, the inner system is inclosed on all sides by the outer system, special arrangements are required for leading off the electricity from the inner system to the outside. It has been proposed for this purpose to provide between the inner and the outer systems fixed insulated conductors with brushes, springs or points, and, on the outer system, to provide both on the inner and outer surfaces slip contact rings connected in pairs, so that the electricity is conducted from the inner system by means of the fixed conductors on to the inner slip rings of the outer system, thence to the connected outer rings and thence by means of brushes, springs or points to the external electrodes. With this arrangement the slip rings cause a certain disadvantage, as the length of spark attainable with the machine in question is mainly dependent upon the distance apart of the positively and negatively charged conductors and therefore also upon the distance of the slip rings. This distance can, however, owing to constructive considerations, at most amount to one-third of the diameter of the largest slip ring.

The present invention has for its object to obviate this disadvantage and it consists in substituting for the slip rings separate conductors insulated from each other, of which always two situated on opposite sides of the axis of rotation effect the transmission of the electricity.

On the accompanying drawings is shown an example of the construction of a multiple influence or condenser machine according to my invention.

Figure 1 shows a longitudinal section. Fig. 2 a part end view. Fig. 3 a part section of a modified construction. Fig. 4 in a diagrammatical manner shows the mode of operation of the machine. Fig. 5 shows a part plan elevation of a disk or plate used in connection with my invention. Fig. 6 is a part vertical section on line A—B of the Fig. 5. Fig. 7 is a vertical section of a modified construction of a disk. Fig. 8 is a vertical section on line C—D of the Fig. 9, and Fig. 9 is the corresponding part plan elevation illustrating a further modified construction of the said disk.

As illustrated in Fig. 1 each plate 1 and each plate 2 except the two utmost disks 3 and 4 has on each side near it a plate rotating in opposite directions. Each plate 1 and 2 consists either of two or several single disks of insulating material, such as for instance indicated in my pending application Serial No. 314011 filed April 27, '06, or of a number of sectors 5 and 6 respectively inclosed by a single disk as hereinafter to be described. Referring to Figs. 5 and 6 the disk consists of two plates  $m$  and  $n$ , between which two successive inductors 6 of thin foil or thin metal sheet are arranged on different sides of an insulating disk  $p$ . In the Fig. 5 the insulating disk  $p$  is omitted. In the Fig. 7 a disk is illustrated consisting of two insulating plates  $m$  and  $n$  between which inductors 6 are arranged. In the Figs. 8 and 9 a constructional form is shown according to which sectors 5 are preferably surrounded by and located in a single disk  $n$ .

The sectors 5 of the outer system which is formed by the larger plates 1 and the sectors 6 of the inner system which is formed by the smaller plates 2 are connected among each other by conductors 7 and 8 respectively. For this purpose short extensions or strips  $z$  are provided which preferably are made integrally with the sectors and are illustrated in the Figs. 6 and 9. These conductors 7 and 8 also serve for carrying the annular-shaped plates 1 and 2. The conductors 7 are provided with metal studs  $k$ , the conductors 8 with metal studs  $f$  for taking off the electricity.

The conductors 7 and 8 are secured to both sides of the plate- and wheel-shaped bodies 9 and 10 respectively. These bodies are mounted on the stationary axle 11 and are adapted to be rotated in opposite directions. The bearings for the axle and the base or

the foundation of the machine are not illustrated for the sake of clearness.

On the studs *k* and *f* equalizers 12 and 13 respectively (see Fig. 4) bear and, as will be seen in each plate system, two studs *k* and two studs *f* lying diametrically opposite each other are connected with each other by these equalizers respectively. The position of the latter is demonstrated in Fig. 4 and their construction is the same as those used in Wimshurst's influence-electrical machine. However the one of the neutralizers 12 or 13 can be dispensed with or they can be arranged at some distance from the studs *k* or *f* without touching them. On the fixed shaft 11 of the machine an insulating carrier 11<sup>a</sup> is fixedly arranged. At each end this carrier is provided with two brushes or points *d* and *e* which are electrically connected with each other.

As illustrated in the Figs. 1 and 2 a great number of metal studs *a* and *b* are arranged on the disk 9 and pins or shanks *a'* form a conducting connection between the studs, which are arranged in circles on both sides of the disk 9 of the outer system, and which, when the machine is in operation, are simultaneously temporarily connected on the one hand by the fixed brushes (or points) *d* and *e* with the collector studs *f* of the inner system, and on the other hand by the brushes *g* with the electrodes *h*. This arrangement enables the transmission of the positive and the negative electricity to be effected on opposite sides of the disk's axis, so that the distance between the conductors which convey the positive and the negative electricity is considerably greater than is possible with the arrangement with slip rings above referred to.

As shown at Fig. 3, the electricity can also be conveyed from the brushes *d* to the conductors such as *i* which convey the electricity from the outer system to the electrodes *h* through the studs *k* and brushes or points *l*, whereby the brushes *g* would be dispensed with.

The outer system consisting of the plates 1 and the inner system constituted by the plates 2 are operated in opposite directions by cord- or belt-pulleys 14 and 15 respectively.

The mode of operation of the machine and the production of influence-electricity by means of the plates 1 and 2 are demonstrated diagrammatically in the Fig. 4. 1 and 2 represent two plates 1 and 2 respectively of the Fig. 1, which plates rotate in opposite directions. 12 and 13 are equalizers, *h*, *h* electrodes and *l*, *e*, *e*, *l*, are brushes. The energizing of the plates is indicated by + and - ,

and as it is observed, there is the same energizing as in Wimshurst's influence-electrical machines.

Having thus fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is:—

1. In a multiple influence or condenser machine, two sets or systems of disks revolving in opposite direction and carried by an outer and inner framework, a series of separate conductors on the frame of the outer system, and insulated from each other, and fixed conducting brushes or points within and without the outer system, which come temporarily in conducting connection with the separate conductors, for the conduction of the electricity from the inner system through the inner brushes or points and the separate conductors to the outer brushes or points serving for the collection of the electricity, and means for the conduction of the electricity of the inner system of disks to the inner brushes or points.

2. In an electrical multiple influence or condenser-machine having an inner and an outer system of operative disks revolving in opposite directions, insulated conducting studs arranged in a circle on the inner side of the frame of the said outer system, a second series of insulated conducting studs on the outer side of said frame, opposite to and in conducting connection with said inner studs, a third series of conducting studs in conducting connection with the inner system of disks, means for conveying the electricity from the third series of conducting studs to the first and second series of studs, electrodes and means for conveying the electricity from the second series of studs to the electrodes, substantially as described.

3. In an electric multiple influence- or condenser-machine having an inner and an outer system of operative disks, insulated conducting studs on the framing of the outer system of disks in conducting connection with the conductors of the said outer system, conducting studs in conducting connection with the inner system of disks, means for conveying the electricity from such last mentioned studs to the said conductors and to said first mentioned studs, electrodes and means for conveying the electricity from the first mentioned studs to the electrodes, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH WOMMELSDORF.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.