No. 744,707. PATENTED NOV. 24, 1903.

T. ARCHER.

STATIC ELECTRICAL MACHINE.

APPLICATION FILED JUNE 23, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

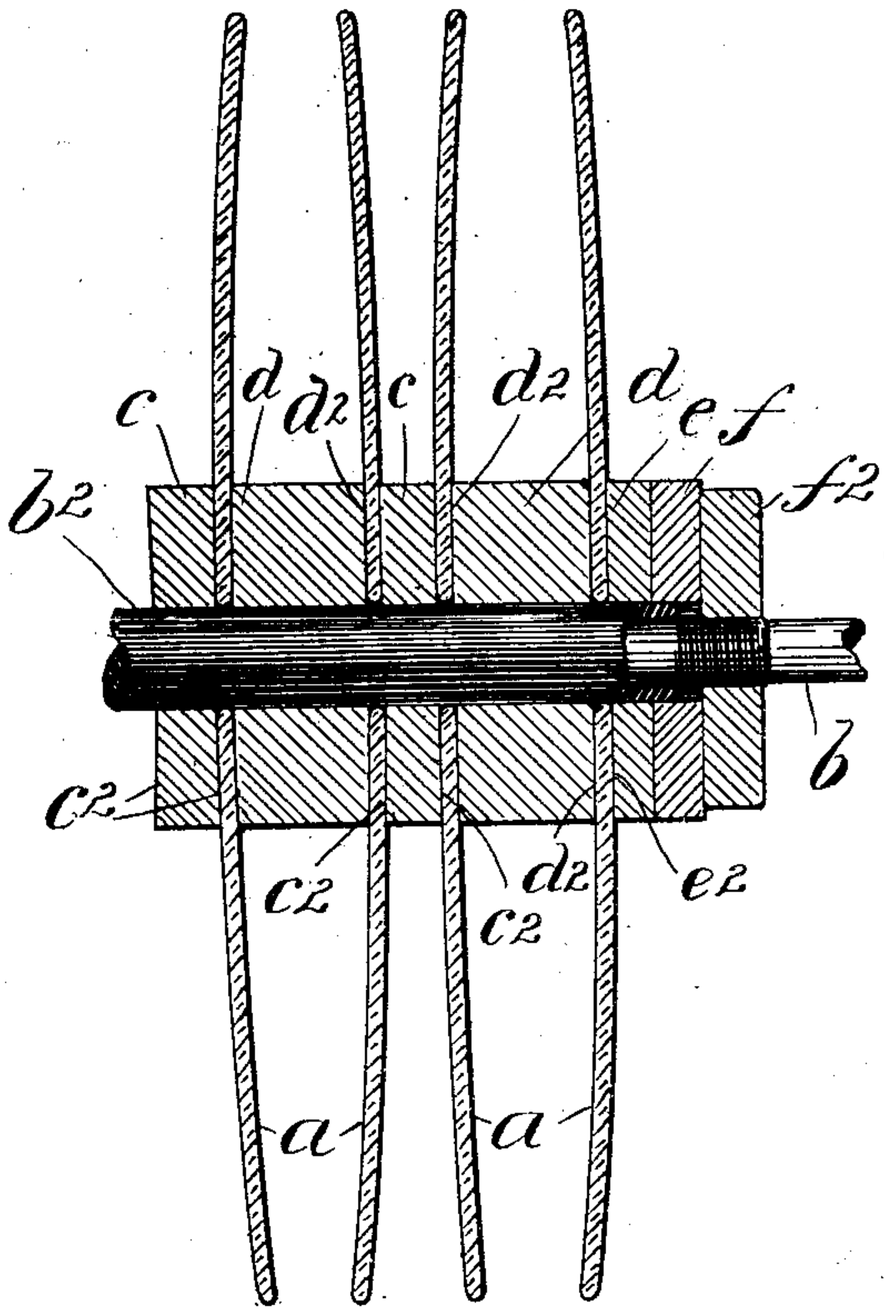

Fig. 1.

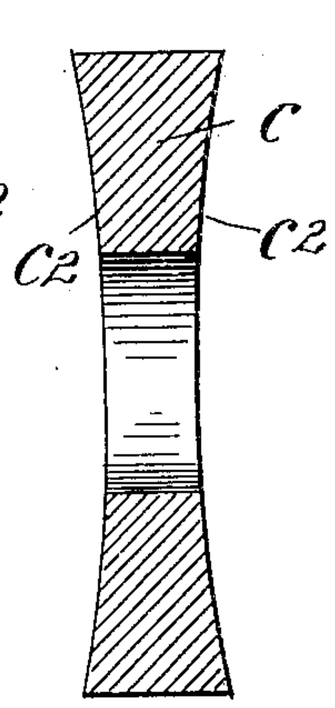

Fig. 2.

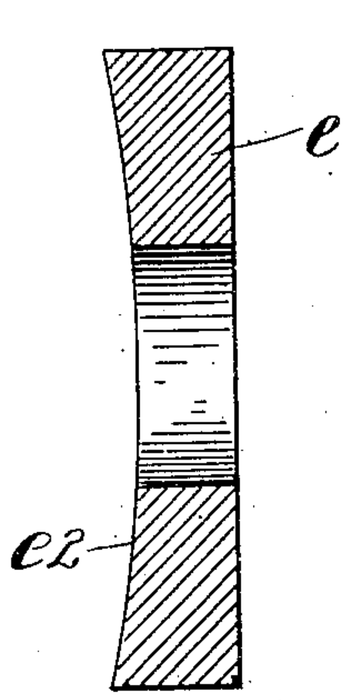

Fig. 3.

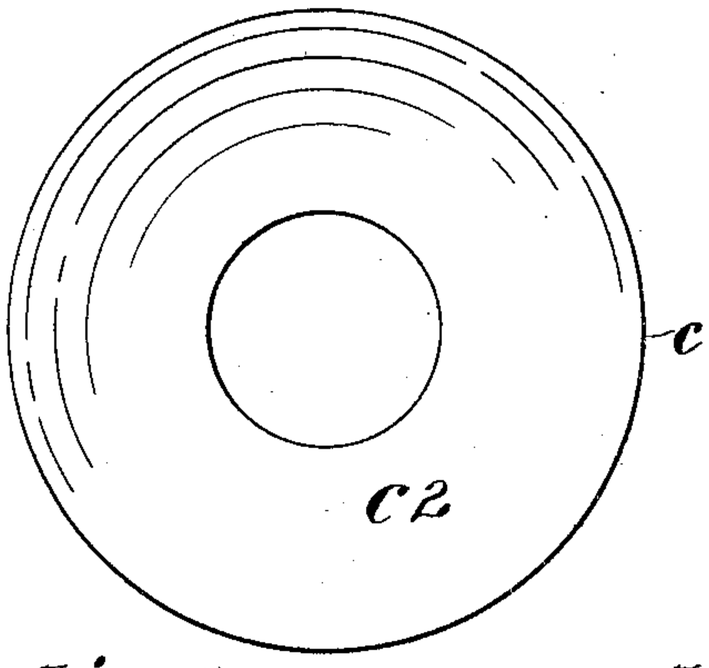

Fig. 4.

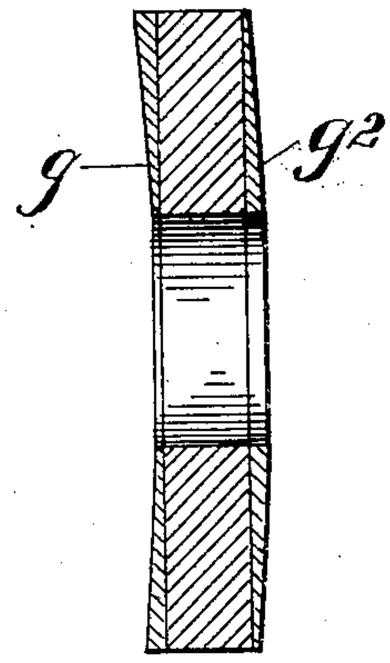

Fig. 5.

WITNESSES

F. A. Stewart

C. E. Mulreany

INVENTOR

Thomas Archer

BY Edgar Gates & Co

ATTORNEYS

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STATIC ELECTRICAL MACHINE.

APPLICATION FILED JUNE 23, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 6.

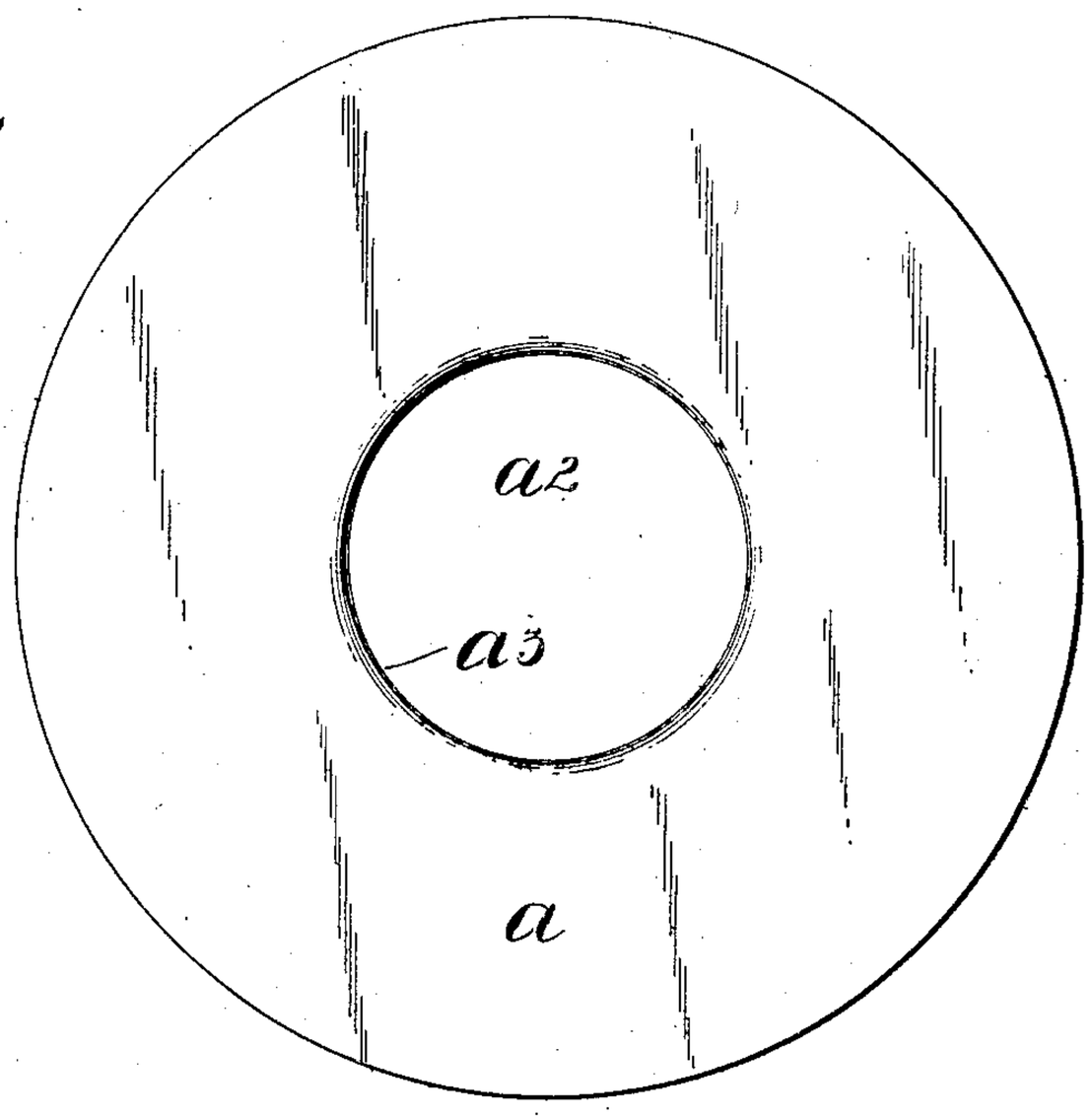

Fig. 7.

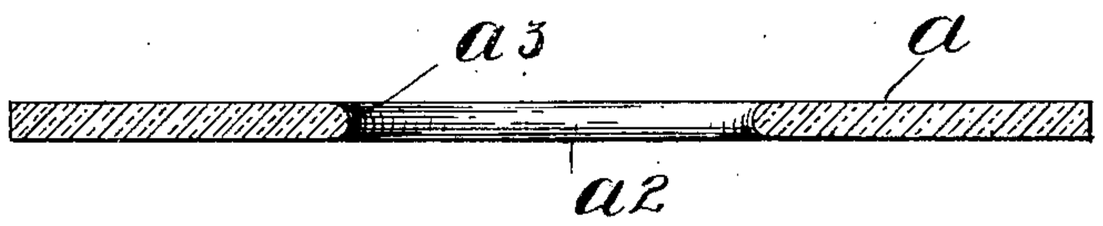

Fig. 8.

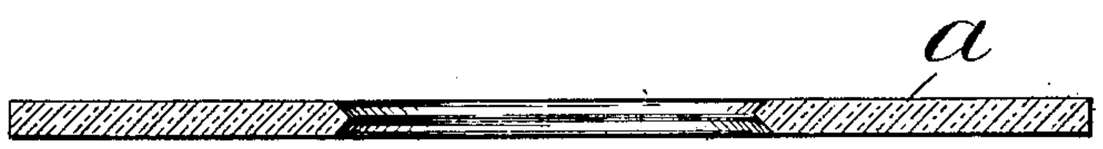

Fig. 9.

WITNESSES

F. A. Stuart.

C. E. Mahoney

INVENTOR

Thomas Archer

BY Edgar Tate & Co

ATTORNEYS

No. 744,707. Patented November 24, 1903.

UNITED STATES PATENT OFFICE.

THOMAS ARCHER, OF WOODSIDE, NEW YORK.

STATIC ELECTRICAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 744,707, dated November 24, 1903.

Application filed June 23, 1903. Serial No. 162,718. (No model.)

To all whom it may concern:

Be it known that I, THOMAS ARCHER, a citizen of the United States, residing at Woodside, in the county of Queens and State of New York, have invented certain new and useful Improvements in Static Electrical Machines, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in static electrical machines, and has particular reference to an improved construction and means for clamping the glass disks upon the shaft of the machine.

In the construction of static machines it is well known that plate-glass disks are not desirable on account of their weight and owing to the presence of metal in their composition and that ordinary window-glass is best adapted for the purpose. This glass, however, not being as strong as plate-glass and necessarily made with convex-concave surfaces is subjected to a great strain when clamped and held together by means of the flat washers ordinarily used, and would very easily break. When cutting the central circular opening in the glass disk by the use of a diamond point or other means, a series of small cracks or imperfections are formed in a line following the course of the diamond point, but radiating out in all directions from the center. Any undue pressure upon the glass will enlarge or extend these imperfections and break the glass. If, however, after the central opening is cut in the glass disk the aforesaid imperfections are removed, it is obvious that the glass disk is materially strengthened and the life of the same very much prolonged.

The object of my invention is to overcome the objectionable feature in static machines above mentioned, and in accomplishing this object I provide a disk which is devoid of the aforementioned imperfections and is capable of standing a much greater pressure than any of the disks heretofore made, and I also provide, with the same object in view, washers or separators having convex and concave surfaces, which are adapted to conform to the adjacent engaging glass surface.

I attain my object by means of the device illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of my improved disks and separators arranged upon the shaft of a static machine. Fig. 2 is an enlarged sectional view through a separator. Fig. 3 is an enlarged sectional view of an end washer. Fig. 4 is an enlarged side view of the separator. Fig. 5 is a section through an ordinary flat washer, showing fillets arranged adjacent thereto. Fig. 6 is a side view of a disk with an enlarged central opening. Fig. 7 is a sectional view of same, and Figs. 8 and 9 are sections showing modified forms.

In practice I provide disks a, having central openings a^2, and in Fig. 1 I show to an exaggerated degree the convex-concave shape of the disks. This curvature in practice is hardly perceptible to the eye, averaging about one-eighth of an inch to every foot. The circular opening a^2 is first cut, by means of a diamond or otherwise, which leaves the roughened surface presenting many minute cracks or imperfections. I remove these imperfections by grinding and highly polishing the surface of the opening, producing a smooth inner surface a^3. This surface is devoid of all cracks or imperfections. The disks a are mounted upon the shaft b over the insulating-coat b^2 and are separated by means of the washers or separators c and d and are held upon the shaft by means of the end washers e and f and the nut f^2. The washers c are formed with concave surfaces c^2, and the washers d with the convex surfaces d^2, which are adapted to engage and conform with the surface of the adjacent glass disks a. The washer e is formed with a concave surface e^2, which engages the end disk upon the shaft. The number of disks upon the shaft is only limited to the size and capacity of the machine and may be fastened beyond the end washer e by any approved means, and the means for mounting the shaft in the machine and rotating same may be of any suitable form.

In Fig. 7 I show the inner surface a^3 of the opening a^2 as rounded, while in Fig. 8 I show a beveled edge and in Fig. 9 a straight edge. The forms shown in Figs. 7 and 8 have no sharp edges, as the edges are ground down and then polished, and one or the other form may be used, as desired.

On machines in which the ordinary squared washers or separators are used I may employ

a fillet g and g^2, as shown in Fig. 5, which may be constructed of plastic composition, rubber, or any other suitable insulating material and may present a concave surface or a convex surface to the adjacent glass disk.

In the use of my improved disk should the said disk become loosened upon the shaft the rounded and highly-polished inner surface of the opening will prevent the tearing or cutting of the insulation upon the shaft, nor will it cut into or tear the insulation when the parts are put together and during the operation of tightening the disks upon the shaft.

An important feature of my improved disk is the fact that in a static machine in which the stationary plates are round and concentric with the shaft and having a central opening through which the shaft passes the rounding and highly polishing of the surface of the opening prevents the diffusion of the electricity into the atmosphere and enables the maximum amount of electricity to be collected.

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

1. In a static electrical machine, disks having central openings, highly-polished surfaces formed upon the inner surface of said central openings and adapted to remove all imperfections upon said surface, and means for attaching said disks to the shafts of the machine, substantially as shown and described.

2. In a static electrical machine, disks having central openings, highly-polished surfaces formed upon the inner surfaces of said central openings and adapted to remove all imperfections upon said surfaces, and suitable washers or separators arranged adjacent to said disks and adapted to provide a means for separating and attaching said disks to the shaft of the machine, substantially as shown and described.

3. In a static electrical machine, disks having central openings, highly-polished surfaces formed upon the inner surfaces of said central openings and adapted to remove all imperfections upon said surfaces, and washers having concave and convex surfaces adapted to engage the adjacent surfaces of the disks and adapted to provide the means for separating and attaching the said disks upon the shafts of the machine, substantially as shown and described.

4. In a static electrical machine, disks mounted upon a shaft of the machine, and washers having concave and convex surfaces adapted to engage the adjacent surfaces of the disks and adapted to afford the means for attaching and separating the said disks upon the shafts of the machine, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 18th day of June, 1903.

THOMAS ARCHER.

Witnesses:
F. A. STEWART,
C. E. MULREANY.