(No Model.)

E. T. BIRDSALL.

STATIC INDUCTION GENERATOR.

No. 398,122. Patented Feb. 19, 1889.

Fig. 2.

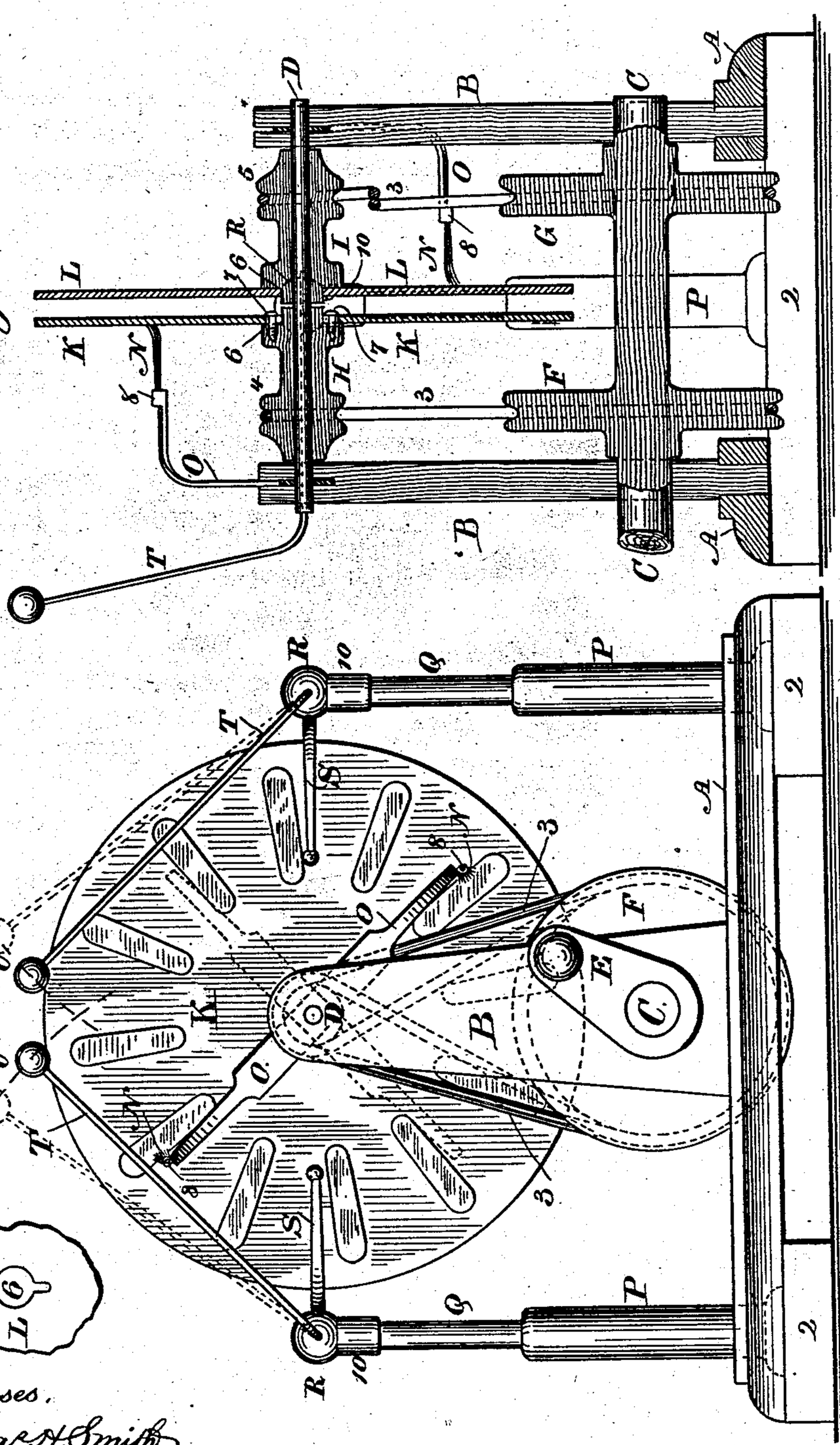
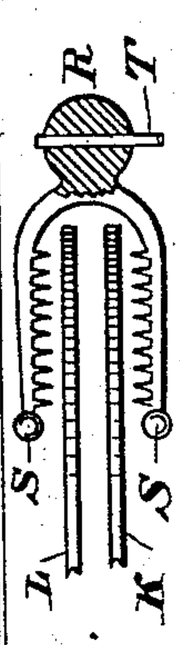


Fig. 1.

Fig. 4.

Fig. 3.



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STATIC-INDUCTION GENERATOR.

SPECIFICATION forming part of Letters Patent No. 398,122, dated February 19, 1889.

Application filed November 14, 1888. Serial No. 290,786. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. BIRDSALL, of the city and State of New York, have invented an Improvement in Electric Induction and Influence Machines, of which the following is a specification.

Electric induction and influence machines have heretofore been made in which two disks of glass have been revolved in opposite directions, and upon the surfaces of the glass there have been strips of foil, and the static charge induced has been received upon combs, and there have been conductors connected with the combs through which the current has been transmitted to any instrument or apparatus—such, for instance, as Geissler tubes or other appliances for demonstrating electric effects.

My present invention relates to the details of construction of such machine, whereby I am enabled to simplify the same, lessen the cost, and render the apparatus more efficient.

It is to be understood that this apparatus is especially adapted for the use of students, schools, and colleges, and it is available for demonstrating electrical operations in which static electricity is made use of.

In the drawings, Figure 1 is an elevation of the apparatus. Fig. 2 is a vertical section through the axis of the disks. Fig. 3 is a horizontal plan, partially in section, of the combs; and Fig. 4 is an elevation of the central portion of one of the disks, showing the mode of fastening the same to the hub.

The base A is usually quadrangular, having cross-pieces 2 at the ends and standards B at the sides supporting the shaft C, and also an axis, D. At one end of the shaft C is a crank-handle, E, and upon the shaft C between the standards B there are two belt-wheels, F and G, with belts 3, to pulleys 4 5 upon the respective hubs H and I. These hubs H and I are preferably of wood and tubular, and through them the axis D passes, such axis being formed of a strong wire. The glass disks K and L are each formed with the central opening, 6, notched at its edges for the reception of the screw 7, and the respective hubs H I are fitted into the central openings of the respective disks, and the screws 7 pass into the hubs through the notches in the glass for securing the disks to the inner ends of the hubs. I find that it is convenient to make these central openings by the use of a sand-blast, and it is also advantageous to varnish the surfaces of the glass disks in order to prevent moisture condensing upon such disks and interfering with the development of the electric current, and there are strips of foil secured to the outer faces of the respective disks, which strips usually occupy radial positions, as represented in Fig. 1. One of the belts 3 is crossed and the other is straight, so that by rotating the shaft C by the handle E the hubs H and I and the respective glass disks connected with them are revolved rapidly and in opposite directions.

The brushes N are made of fine wire or preferably of bunches of tinsel, and these are supported by the diagonal arms O, which arms are of sheet metal, and each end of each arm is made with a lateral projection, 8, that is folded around to inclose the base of the bunch of wires or bunches of tinsel, and these are secured by solder run into a loop formed by the folded lateral projection 8. These arms O are received into saw-cuts in the standards B and are held by the axis D, passing through a hole in each arm, and the bases of the saw-cuts in the standards are at about an angle of forty-five degrees to the horizon, so that the respective arms and brushes stand diagonally and in opposite directions with the brushes against the faces of the respective disks. I find this is a cheap, convenient, and efficient mode of constructing the brushes, and it allows for replacing the brushes cheaply and rapidly, should they become injured.

Upon the end base pieces, 2, are the columns P, which are made of wood and hollow for the reception of the glass rods Q, and at the upper ends of these glass rods Q are the knobs R, forming the bases of the combs S, and each knob R has a cylindrical connection, 10, around the upper end of the glass rod. I find in practice that these knobs, combs, and cylinders can be cast in one, of pewter or similar soft metal, around the upper ends of the glass rods, and they remain firmly connected thereupon, especially where the glass rod is slightly indented with a file or otherwise at one side to prevent the knob turning thereon, and through each knob a hole is cored or formed by a pin introduced into the mold and

afterward driven out of the casting, through which hole the wire T passes, and each wire T is L-shaped or bent at a right angle and terminates with the knob or electrode U. The wires T are to fit the holes in the knobs R tightly, so that there will be sufficient friction to allow for swinging the wires and knobs nearer together or farther apart, as indicated by the dotted lines in Fig. 1, so as to lengthen or shorten the arc between the electrodes.

In practice this electric machine is very efficient, and it occupies but a small space, and for transportation the parts can be separated with facility and packed into a small space, and there is but little difficulty in taking the machine apart or putting it together, because the wires T can be pulled out from the knobs R and readily inserted, and by withdrawing the axis D the hubs and glass disks can be removed from position and packed, so as to prevent injury to such glass disks in transportation, and when the axis D is removed the arms O can also be lifted out from the standards and packed separately.

I claim as my invention—

1. The glass disks K and L, having varnished surfaces and provided with strips of foil and each having a central notched opening, in combination with the wooden hubs H I, fitting into the central openings in the respective disks and secured by screws, and the removable axis D, standards B, and base A, substantially as set forth.

2. The knobs R, combs S, and cylinders 10, cast in one and having holes through the knobs, in combination with the glass rods Q, around which the cylinders 10 are cast, and the wires T, passing through the holes of the knobs R and provided with knobs or electrodes U upon their ends, substantially as set forth.

3. The combination, with the glass disks and the respective tubular hubs to which they are connected, of the axis D, passing through the hubs, the base A, and standards B, and the arms O and brushes N, the standards being slotted or saw-cut diagonally for the reception of the arms, and the arms being perforated for the passage of the axis, substantially as set forth.

4. The combination, in the electric machine, of the glass disks K L, wooden hubs H I, to which the glass disks are connected, the base A and standards B, the removable axis D, passing through the hubs and standards, the shaft C, belt-wheels F G, and belts to pulleys upon the respective hubs, the arms O within diagonal slots in the standards, the brushes N upon the ends of the arms, the knobs R and combs S, and the glass rods Q, for supporting the same, the wires T, passing through the knobs, and the electrodes at the ends of the wires, substantially as set forth.

Signed by me this 8th day of November, 1888.

EDWARD T. BIRDSALL.

Witnesses:
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WM. A. MOSSCROFT.