July 4, 1933. P. I. CHANDEYSSON 1,916,256

HOMOPOLAR GENERATOR

Filed Sept. 5, 1930 2 Sheets-Sheet 1

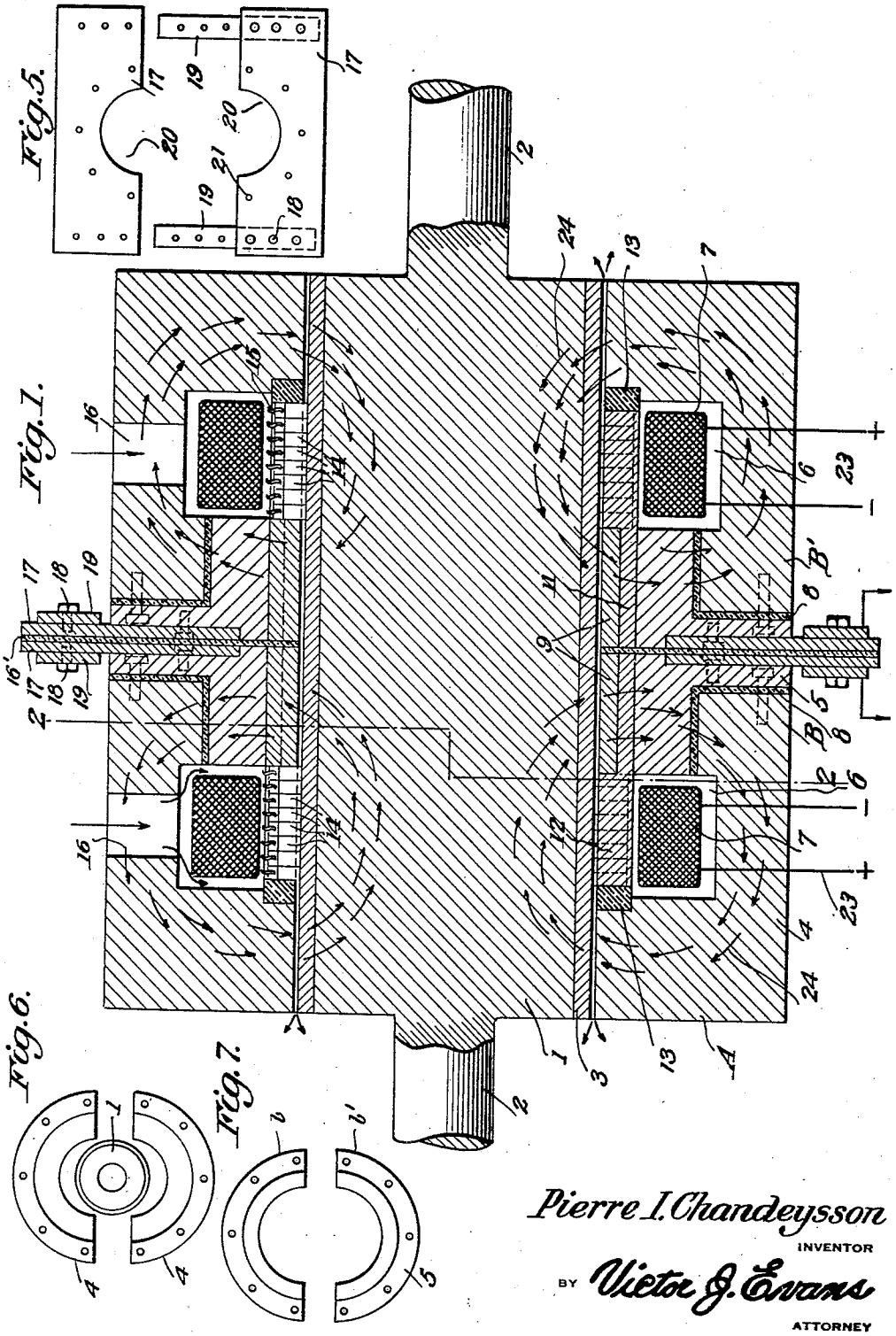


Fig. 5.

Fig. 1.

Fig. 6.

Fig. 7.

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Filed Sept. 5, 1930 2 Sheets-Sheet 2

Fig. 4.

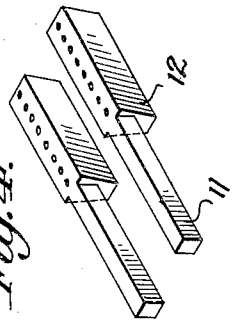


Fig. 3.

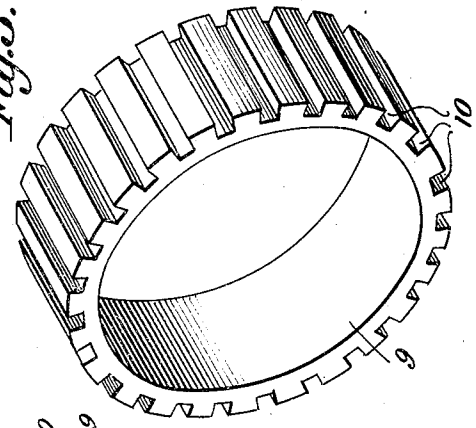
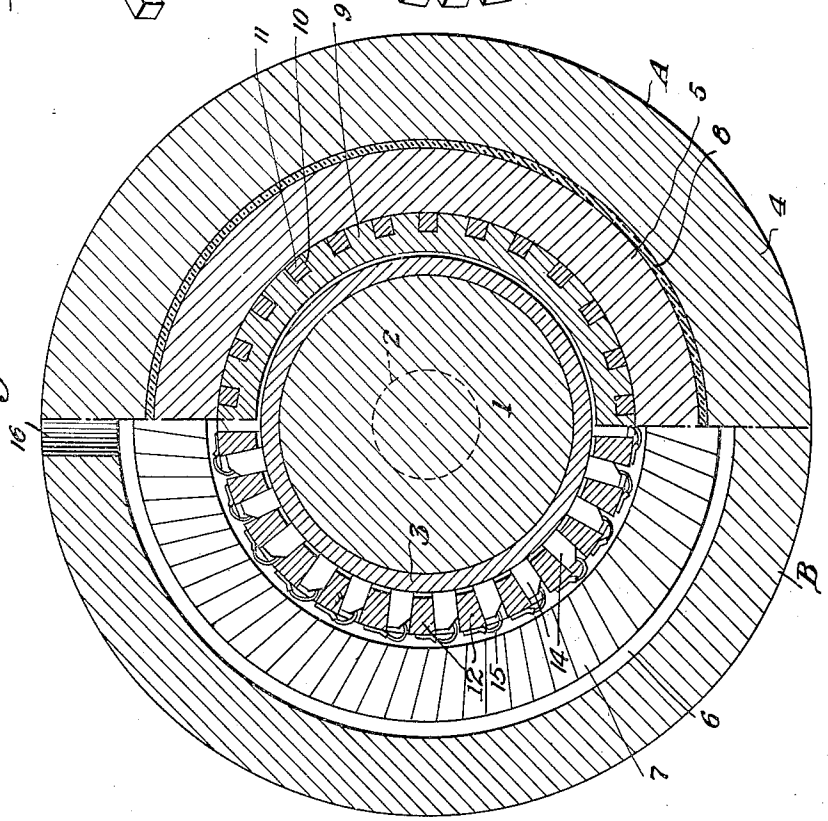


Fig. 2.



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UNITED STATES PATENT OFFICE

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HOMOPOLAR GENERATOR

Application filed September 5, 1930. Serial No. 479,984.

This invention relates to a homopolar generator, the general object of the invention being to provide a direct current generator of low voltage and high amperage, such as are used in electro-plating, electro-galvanizing and deposition of metals in general, and which can also be used for electrolytic work, welding and other processes requiring large currents at comparatively low tension.

Another object of the invention is to provide a generator which has great simplicity and is composed of comparatively few parts, one that is easy to assemble and disassemble and is compact and rugged and in which adjustments are practically eliminated and one which can be built at low cost and the maintenance cost of which is low and one which will have the maximum efficiency.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a sectional view through the apparatus.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a perspective view of one of the brush carrying rings.

Figure 4 is a view of a pair of the brushes.

Figure 5 is a view of one of the take-off members, showing the parts thereof separated.

Figure 6 is a view looking toward the inner end of the part 4 of the casing and showing the sections thereof spaced apart, with the cylinder between them.

Figure 7 is a section looking toward the inner end of the part 5.

In these drawings, the numeral 1 indicates a drum or solid cylinder formed of magnetic material and having trunnions 2 at its ends so that the cylinder can be rotatably supported from suitable supporting means. A sleeve 3 is placed on the cylinder and is formed of copper, brass or any other suitable material. A circular casing A surrounds the cylinder and said casing is formed of the two sections B and B′ and each section is composed of the parts 4 and 5 of magnetic material. Each of the sections is also composed of a pair of semi-circular sections *b* and *b′* which are suitably connected together and each of the parts 4 and 5 is of substantially L-shape in cross section, with the inner end of the part 5 only partly filling the space formed in the part 4 so that when the two parts are placed together, an annular chamber 6 is formed for receiving the coil 7. The chamber has its inner circumference opening out through the bore of the casing.

The outer edge of the part 5 is flush with the outer circumference of the part 4 and the two parts are separated by the non-conducting material 8. A ring 9 contacts the inner circumference of the part 5 which has an interior diameter greater than that of the part 4. This ring 9 is provided with a plurality of transverse grooves 10 in its outer circumference for receiving the stems 11 of the substantially wedge-shaped bars 12, these bars extending across the inner part of the chamber 6 and abutting a ring 13 of non-conducting material, which insulates the brush and the bars from the part 4. A plurality of brushes 14 is movably held between each pair of the bars 12 and are connected by the conductors 15 with a bar.

A port 16 is in communication with the chamber 6 and is adapted to be connected to a source of compressed fluid, such as air, so that the pressure of this fluid in the chamber will hold the brushes or contactors against the sleeve 3. As shown, the casing A is spaced from the sleeve 3 so that air from the chambers 6 can escape, this air not only acting to hold the brushes against the sleeve, but also acting to cool the parts.

The sections B and B′ are separated from each other by the insulating material 16′ and a sectional plate 17 is fastened to the inner end of each section by the bolts 18. The two sections of the plate 17 are connected together by the strips 19 and as will be seen, the

inner edge of each section is formed with a semi-circular recess 20 which is of considerably greater diameter than the inner diameter of the part 5 so that the sections of the plates are spaced from the rings 9 and the parts 5 are preferably recessed to receive portions of the plates. The non-conducting material 16' extends between the plates so as to insulate the plates from each other. The plates are bolted or otherwise fastened to the parts 5, as shown at 21, and each part 5 is connected to its companion part 4 by bolts 22 which are insulated from the part 4.

Thus it will be seen that when the parts are assembled and the coils 7 connected with a suitable source of supply, through means of the conductors 23, the magnetic flow will be as indicated by the arrows 24 in Figure 1, so that the rotating cylinder 1 will move through the magnetic field and the resultant current flows from the cylinder through the brushes, the bars 12, a ring 9 and through the part 5 to a plate 17 and will return through the other plate, the other part 5 and its ring, through the brushes, back to the cylinder. By removing one of the semi-circular sections of each half of the apparatus, the coils, brushes and their supporting rings are exposed so that repairs can be readily made or the parts inspected and the entire apparatus can be easily and quickly assembled and dissassembled.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

1. A homopolar motor comprising a rotor formed as a cylinder of magnetic material surrounded by a sheathing of non-magnetic material, a stator surrounding the rotor and comprising two similar sections each including an outer ring member substantially L-shaped in cross section including a radial wall portion and a circumferential flange portion, an inner ring likewise substantially L-shaped in cross section having a radial wall portion adjacent the inner edge of the flange portion of the first named ring and further having a radial flange disposed adjacent the inner periphery of the flange portion of the first named ring, the flange portion of the second named ring being of less length than that of the first named ring so as to define a circumferential chamber, a coil located within said chamber, insulating material located between the adjacent surfaces of the first and second named rings, a ring located within the confines of said second named ring and having its periphery formed with a series of grooves, brushes located within said chamber and bearing against said sheathing, and separators located between said brushes and having reduced stems fitting within said grooves.

2. A homopolar motor comprising a rotor formed as a cylinder of magnetic material surrounded by a sheathing of non-magnetic material, a stator surrounding the rotor and comprising two similar sections each including an outer ring member substantially L-shaped in cross section including a radial wall portion and a circumferential flange portion, an inner ring likewise substantially L-shaped in cross section having a radial wall portion adjacent the inner edge of the flange portion of the first named ring and further having a radial flange disposed adjacent the inner periphery of the flange portion of the first named ring, the flange portion of the second named ring being of less length than that of the first named ring so as to define a circumferential chamber, a coil located within said chamber, insulating material located between the adjacent surfaces of the first and second named rings, a ring located within the confines of said second named ring and having its periphery formed with a series of grooves, brushes located within said chamber and bearing against said sheathing, and separators located between said brushes and having reduced stems fitting within said grooves, said motor consisting of said elements arranged in duplicate and in end to end relation with insulating means interposed therebetween.

3. A homopolar motor comprising a rotor formed as a cylindrical member of magnetic material surrounded by a sheathing of non-magnetic material, a stator formed with a circumferential chamber containing a coil, a ring member forming a closure for the chamber, a second ring member located within the confines of said first named ring member and formed with transverse grooves, an abutment ring of insulating material located within the chamber, brushes located within the chamber inwardly of and connected with said coil and abutting against said last named ring and bearing against said sheathing, and separating members located between the brushes and having reduced stems located within the grooves in the second named ring.

In testimony whereof I affix my signature.

PIERRE I. CHANDEYSSON.