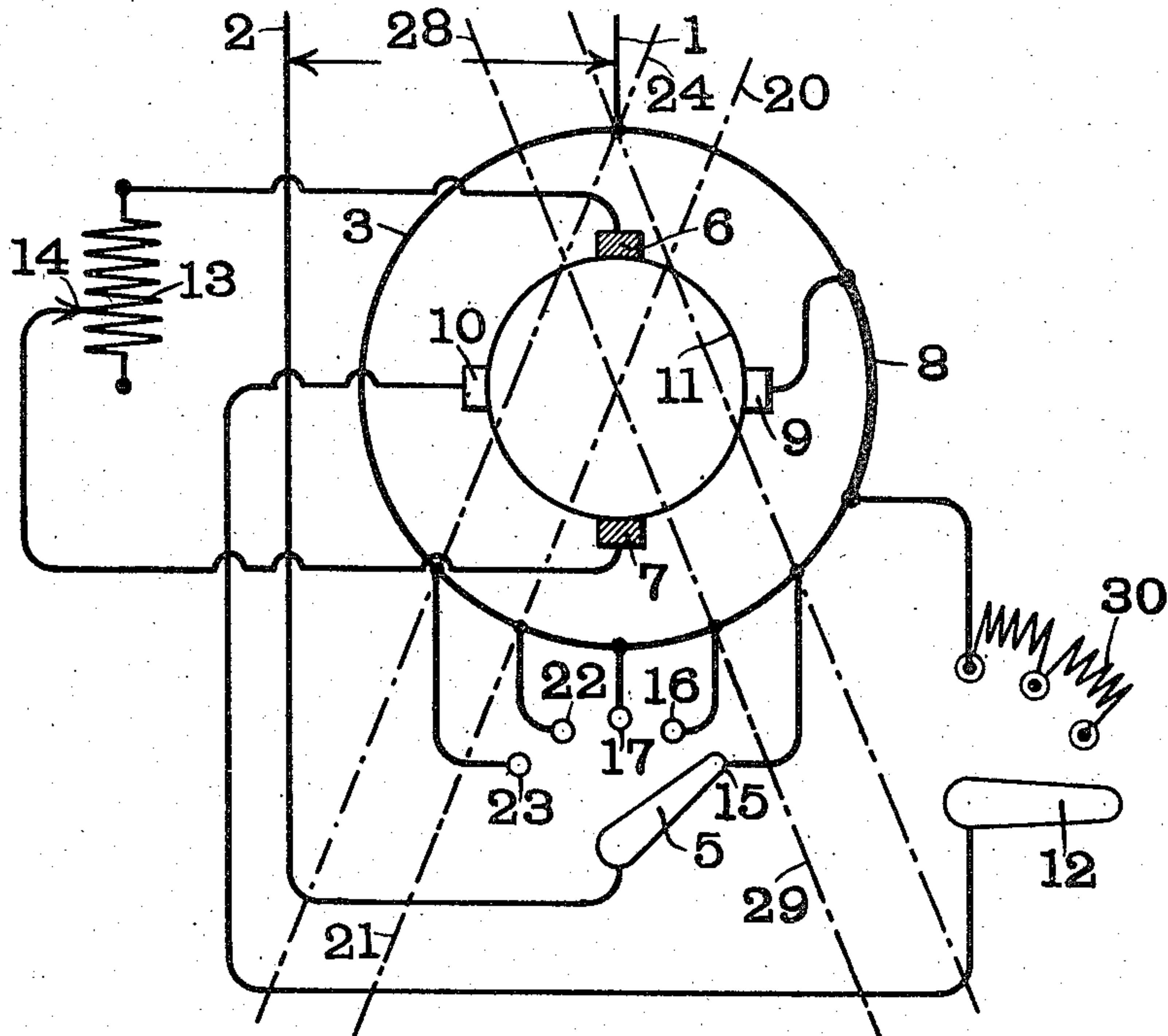


V. A. FYNN.  
 ALTERNATING CURRENT MOTOR.  
 APPLICATION FILED NOV. 29, 1909.

994,382.

Patented June 6, 1911.



WITNESSES

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# UNITED STATES PATENT OFFICE.

VALÈRE ALFRED FYNN, OF LONDON, ENGLAND.

## ALTERNATING-CURRENT MOTOR.

994,382.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed November 29, 1909. Serial No. 530,286.

*To all whom it may concern:*

Be it known that I, VALÈRE ALFRED FYNN, a subject of the King of England, residing at London, England, have invented a certain new and useful Alternating-Current Motor, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention refers to single phase alternate current commutator motors normally operating at a nearly constant speed. Its objects are to enable such machines to be started as series induction motors with a more powerful torque than has hitherto been possible without, however, increasing the terminal voltage at starting, to simplify the starting and reversing connections and to enable the motor to operate under the most favorable conditions after it has been converted into a machine with a shunt characteristic.

In further description I will refer to the accompanying drawing which illustrates my invention as applied to a two-pole motor.

In Figure 1 the inducing member carries a main inducing winding 3 diagrammatically indicated by a circle. This winding is preferably of the drum type. One point 24 of 3 is directly connected to main 1. Switch 5 is connected to main 2 and adapted to make contact with a number of points of the inducing winding 3. Of these points, that marked 17 is diametrically situated with respect to 24 whereas 22, 23 and 15, 16 are situated on either side of 17 and a suitable distance therefrom. The induced member carries a commuted winding 11 closed by way of the brushes 6, 7 along an axis approximately coinciding with the line 24, 17. A resistance or impedance 13 regulatable at 14 is included in this circuit but the brushes 6, 7 can also be directly short-circuited. The commuted winding is further adapted to be closed along another axis by way of the brushes 9, 10, and with or without the inclusion of a compensating E. M. F. thus providing an exciting circuit in normal operation. It is preferable to make use of such a compensating E. M. F. In Fig. 1 this E. M. F. is, by way of example, derived from the portion 8 of the main stator winding 3. This portion 8 is distinguished by a heavy line in the figure. The switch 12

controls the exciting circuit comprising the commuted winding, the brushes 9, 10, part 8 of the main winding 3, and a resistance or preferably an inductance 30.

The operation of this machine is as follows: Point 24 of 3 and switch 5 are connected to the mains 1, 2, switch 12 is preferably left open, brushes 6 and 7 are short-circuited or closed over more or less of the inductance or the resistance 13. If it is desired to start the motor in say, a clockwise direction, then switch 5 is placed on point 15 and the greater part of the current taken by the motor will then obviously flow from 15 to 24 over 8; the remainder will flow from 15 to 24 by way of the rest of the winding 3. The magnitude of the transformer flux generated by 3 will be determined by the smallest number of conductors of 3 included between point 24 and the point in contact with switch 5. The number of these turns will be a maximum when 5 stands in its working position, that is on 17. When 5 stands on 15 the flux generated by 3 will be greater than in the working condition and the motor will start with a more powerful torque than would otherwise be possible without increasing the line voltage at starting. Simply increasing the magnitude of the flux is, of course, not sufficient in itself to start the motor. It is also necessary that the axis of the flux due to 3 be displaced from that along which 11 is closed. This condition is fulfilled by connecting main 2 to point 15 for the axis of the magnetization due to 3 is thereby shifted to the dotted line 28, 29. As the motor gathers speed switch 5 is moved nearer to point 17 and the exciting circuit is closed by means of 12, the inductance 13 being gradually cut out, or that circuit being directly short-circuited. Switch 5 is finally brought to point 17 and if a speed very near the synchronous is desired then 13 and 30 are entirely cut out. Moving switch 5 from 15 to 17 gradually reduces the magnitude of the transformer field due to 3 to its normal value and also achieves the important and desirable purpose of finally bringing the axis of magnetization due to 3 into coincidence with the brush line 6, 7.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an alternating current motor, the combination with a stator provided with a distributed inducing winding connected to



the mains, of a rotor, means for closing the rotor winding along at least two axes and means for changing the point of connection of only one of the mains to the distributed stator winding without changing the number of active turns of said winding.

2. In an alternating current motor, the combination with a stator provided with a distributed inducing winding connected to the mains, of a rotor provided with a commuted winding, means for closing the rotor winding along two axes one of which coincides with the magnetization produced by the distributed stator winding, and means for changing the point of connection of only one of the mains to the distributed stator winding.

3. In an alternating current motor, the

combination with a stator provided with a distributed inducing winding connected to the mains, of a rotor provided with a commuted winding, means for closing the rotor winding along an axis coinciding with the magnetization produced by the distributed stator winding, means for impressing a compensating E. M. F. on the rotor along another axis, and means for changing the point of connection of only one of the mains to the distributed stator winding.

In testimony whereof, I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

VALÈRE ALFRED FYNN. [L. S.]

Witnesses:

E. E. HUFFMAN,

ELIZABETH BAILEY.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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