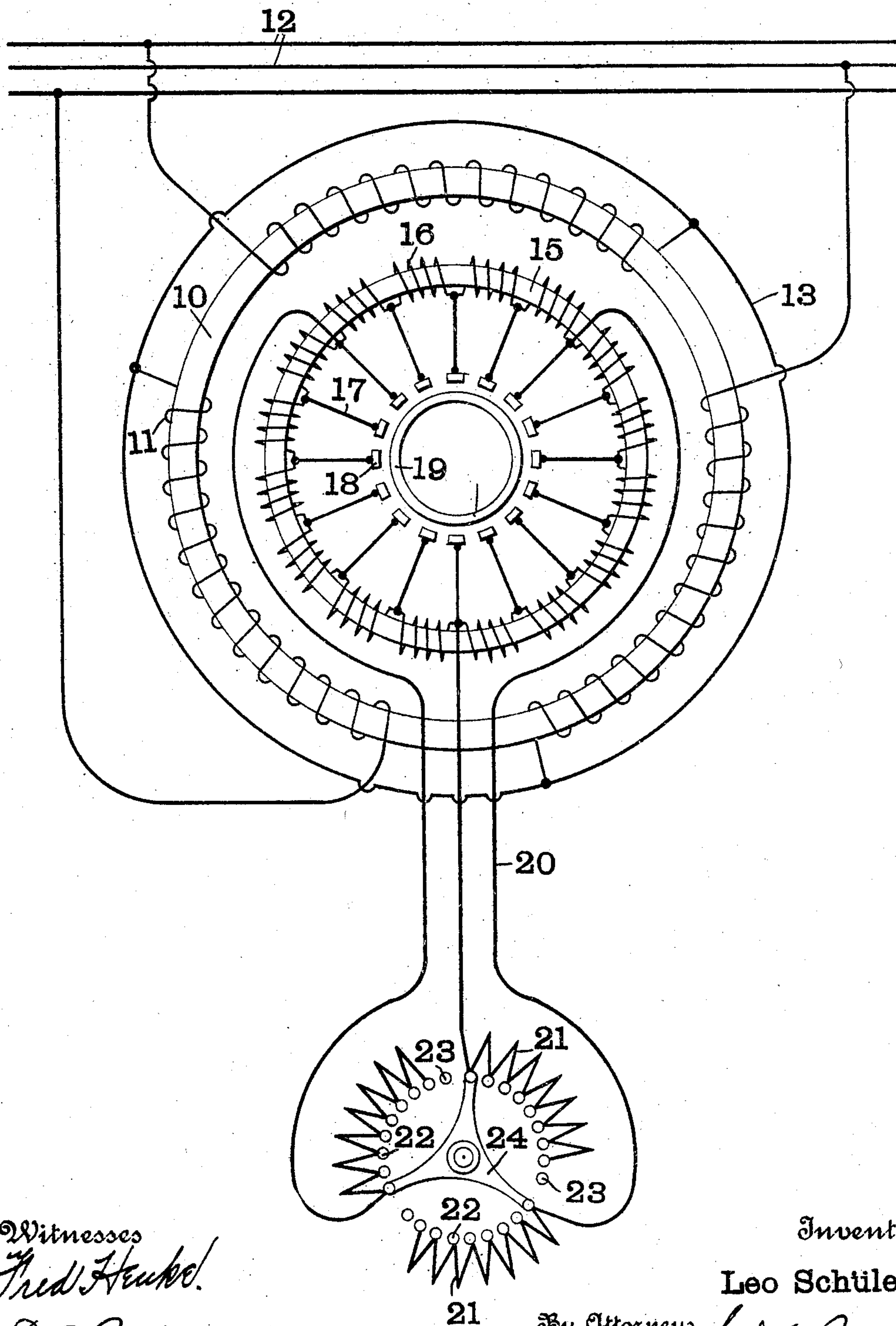


No. 795,861.

PATENTED AUG. 1, 1905.

L. SCHÜLER.
ALTERNATING CURRENT INDUCTION MOTOR.
APPLICATION FILED JULY 16, 1904.



Witnesses

Fred Heube

O. Betjeman

Inventor

Leo Schüler.

By Attorneys

Lothar & Beyer

UNITED STATES PATENT OFFICE.

LEO SCHÜLER, OF ST. LOUIS, MISSOURI.

ALTERNATING-CURRENT INDUCTION-MOTOR.

No. 795,861.

Specification of Letters Patent.

Patented Aug. 1, 1905.

Application filed July 16, 1904. Serial No. 216,920.

To all whom it may concern:

Be it known that I, LEO SCHÜLER, a subject of the King of Prussia, German Emperor, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Alternating-Current Induction-Motors, 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 relates more particularly to induction alternating-current motors of the type designed to produce high torque and low current consumption at starting. Such motors usually have a starting resistance connected in circuit with the induced member or armature at starting and the armature-winding is short-circuited at a small number of points (usually three) when normal working speed is attained.

The object of my invention is to increase the number of points at which the induced or armature winding of the motor is short-circuited. By doing this the output of the motor can be considerably increased and its power factor and efficiency are improved.

My invention therefore consists in combining with an alternating field an induced member or armature which is uncommutated at starting, a conductor containing a resistance and connected to said member at a plurality of points at starting the motor, a second conductor inoperative at starting and connected at a plurality of additional points to said member, and means for rendering a second conductor operative to short-circuit said member.

Referring now to the drawing herewith, which shows one type of induction-motor embodying my invention, 10 indicates the core of the motor-field, which is provided with three coils or windings 11. Each of these coils 11 is connected to one of the main-line conductors 12, and the other end of each of the coils is connected to a common conductor 13, thus forming a three-phase motor-field having a connection well known in the art.

15 is the core of the induced member or armature of the motor. The armature-winding is of the continuous type and is composed of a plurality of coils 16, connected in series. At fixed points between the coils 16 are electrically-connected leads 17, leading to contact-plates 18, adapted to be connected together by a conducting-ring 19 to provide a large

number of short circuits for the armature-coils, as hereinafter described. Three short-circuiting conductors 20 are also provided and are connected at three equidistant fixed points to the armature-winding. These three conductors 20 are connected to the three divisions 21 of an adjustable resistance of any desired character. These resistance-divisions 21 are connected to contacts 22. Open-circuit contacts 23 are also provided. The contacts 22 and 23 are circularly arranged within the reach of the switch-arm 24, which is thus adapted to open the circuit through the conductor 20 and to vary the amount of resistance in such circuit, as desired.

In the operation of my invention I prefer to start the motor with the resistance 21 completely cut into circuit, with the armature-winding and the ring 19 out of contact with the contact-plates 18. The resistance thus included in the armature-circuit reduces the starting-current and increases the starting torque, as is well known in this art. As the motor approaches normal running speed the resistance 21 is gradually excluded from the circuit through the conductors 20, thus converting such circuit into a short circuit for the armature, and when normal speed has been attained the conducting-ring 19 is brought by any suitable means into contact with the plates 18, thus introducing into the induced circuit a number of additional short circuits of very low resistance.

It will be evident that either member of my motor may be the rotary member, that it may be energized by polyphase alternating current of any desired number of phases, that the conducting-ring 19 may be actuated to close the short circuits through the leads 17 by any suitable means, and that the variable resistance 21, so long as it is electrically connected with fixed points of the armature-winding, may rotate with the armature or not, as desired; it being only necessary to vary the details of construction of the motor as the varying circumstances require. Such variations may be made without departing in the least from the principle of my invention.

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

1. The combination with a field adapted to be energized by polyphase alternating current, of an induced member, a conductor electrically connected in polyphase relation to said member at a plurality of points at starting,

and a second conductor inoperative at starting and adapted to be connected at a plurality of additional points to said member to short-circuit said member.

2. The combination with a field adapted to be energized by polyphase alternating current, of an induced member, a conductor electrically connected in polyphase relation to said member at a plurality of fixed points at starting, and a second conductor adapted to be electrically connected at a plurality of additional fixed points to said member to short-circuit said member.

3. The combination with a field adapted to be energized by polyphase alternating current, of an induced member, a conductor containing a variable resistance and electrically connected in polyphase relation to said member at a plurality of fixed points at starting, and a second conductor adapted to be electrically connected at a plurality of additional fixed points to said member to short-circuit said member.

4. The combination with a field adapted to be energized by polyphase alternating current, of an induced member, a conductor connected in polyphase relation to said member at a plurality of fixed points at starting, and a second conductor inoperative at starting and adapted to be electrically connected at a plurality of additional fixed points to said member to short-circuit said member.

5. The combination with a field adapted to be energized by polyphase alternating current, of an induced member provided with a continuous-coil winding, a conductor electrically connected in polyphase relation to said winding at a plurality of points at starting, and a second conductor inoperative at starting and adapted to be connected at a plurality of additional points to said winding to short-circuit said winding.

6. The combination with a field adapted to be energized by polyphase alternating current,

of an uncommuted induced member, a conductor electrically connected in polyphase relation to said member at a plurality of points at starting, and a second conductor inoperative at starting and adapted to be connected at a plurality of additional points to said member to short-circuit said member.

7. The combination with a field adapted to be energized by polyphase alternating current, of an uncommuted induced member provided with a continuous-coil winding, a conductor containing a variable resistance and electrically connected in polyphase relation to said winding at a plurality of fixed points at starting, and a second conductor inoperative at starting and adapted to be connected at a plurality of additional fixed points to said winding to short-circuit said winding.

8. The combination with a field adapted to be energized by polyphase alternating current, of an induced member, a conductor electrically connected in polyphase relation to said member at a given number of fixed points at starting, and a second conductor adapted to be electrically connected at a larger number of additional fixed points to said member to short-circuit said member.

9. The combination with a field adapted to be energized by polyphase alternating current, of an induced member, a conductor containing a variable resistance and electrically connected in polyphase relation to said member at a given number of fixed points at starting, and a second conductor adapted to be electrically connected at a larger number of additional fixed points to said member to short-circuit said member.

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

LEO SCHÜLER. [L. s.]

Witnesses:

D. C. BETJEMAN,
J. H. BRYSON.