J. B. WIARD.

INDUCTION MOTOR.

APPLICATION FILED FEB. 20, 1906.

917,224. Patented Apr. 6, 1909.

Fig. 2.

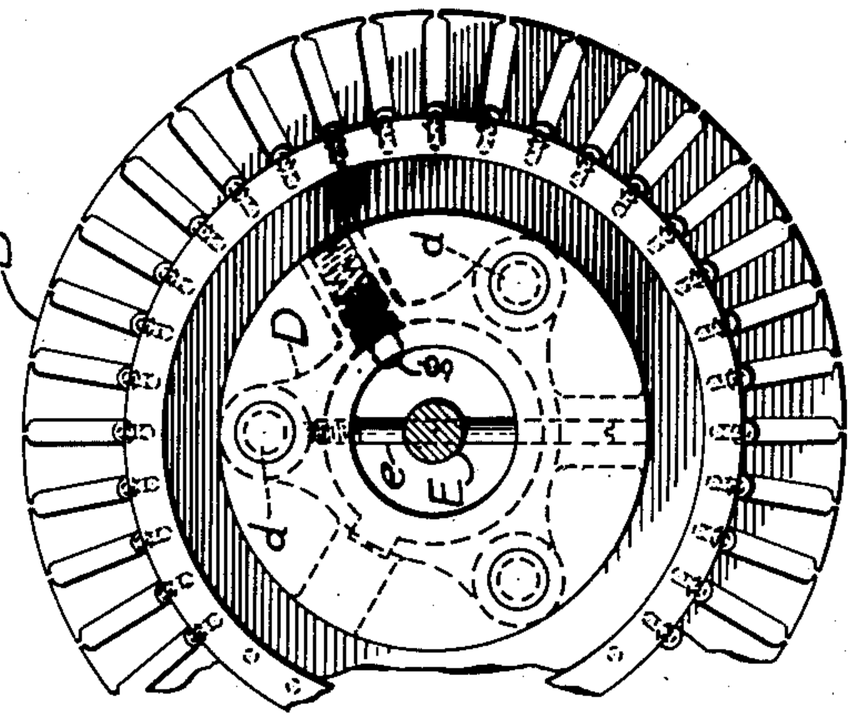
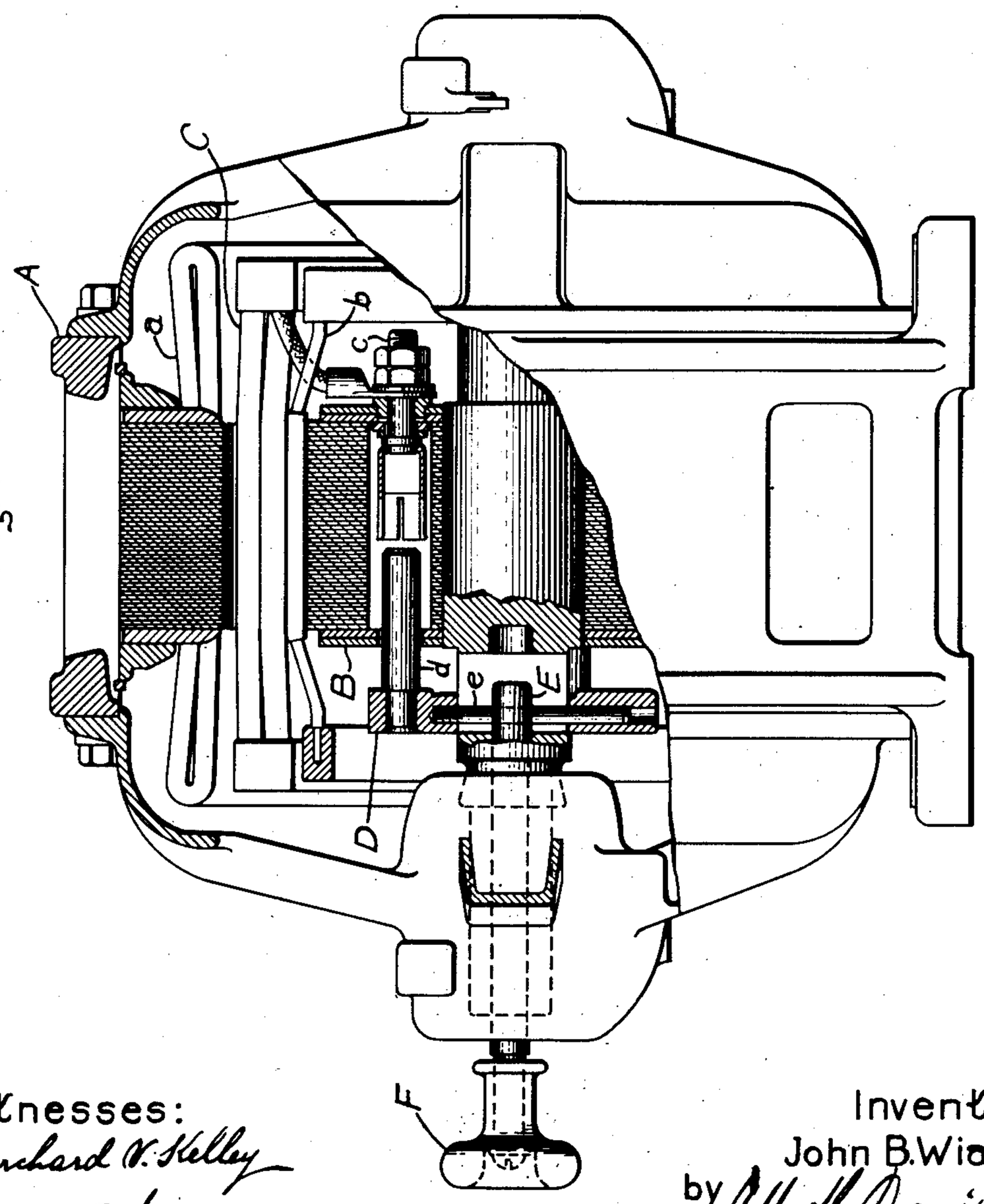


Fig. 1.



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by Albert G. Davis Atty.

UNITED STATES PATENT OFFICE.

JOHN B. WIARD, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

INDUCTION-MOTOR.

No. 917,224. Specification of Letters Patent. Patented April 6, 1909.

Application filed February 20, 1906. Serial No. 302,045.

To all whom it may concern:

Be it known that I, JOHN B. WIARD, a citizen of the United States, residing at Lynn, county of Essex, and State of Massachusetts, have invented certain new and useful Improvements in Induction-Motors, of which the following is a specification.

My invention relates to induction motors of the type in which the rotor is provided with switch contacts for controlling the effective resistance of the rotor winding, and its object is to provide a novel arrangement of the rotor and contacts whereby an economy of space is secured and the contacts are protected from dust and corrosion.

My invention broadly consists in inclosing the switch contacts within the laminated body of the rotor. With this arrangement not only is the space usually occupied by these contacts saved but also the rotor body itself serves to protect the contacts from dust and other sources of injury or deterioration.

My invention further comprises a number of other features which will best be understood by referring to the accompanying drawings, in which—

Figure 1 shows a side elevation, partly broken away and in cross-section, of a motor arranged in accordance with my invention; and Fig. 2 shows an end view of a portion of the rotor.

In the drawing, A represents the stator or primary member which is constructed in the usual manner and carries the usual primary winding *a*.

B represents the rotor body carrying the rotor winding, which, in the present case, is shown as formed of two portions,—one a high-resistance short-circuited winding *b* of the squirrel-cage type, and the other a low resistance open-circuited coil winding C. The terminals of the low-resistance winding C are connected to contacts *c*, which extend from one end of the rotor body into axially-extending tunnels therein.

D represents an axially-movable spider, carried at the opposite end of the rotor body, and supporting contacts *d*, which extend into the tunnels in the rotor body, and, when, the spider is moved axially, engage the contacts *c* so as to short-circuit the low-resistance rotor winding. The spider D is operated by means of an axially-movable rod E, to which it is connected by means of a pin *e*. The rotor shaft is hollowed out to receive the rod E and is slotted to allow for the axial movement of the pin *e*. The outer end of the rod E is provided with a relatively rotatable handle F, by means of which the rod may be pushed inward to shift the spider and bring the contact *d* into engagement with the contact *c*. The spider is preferably provided with the usual spring-actuated latch *g* shown in Fig. 2, which releasably holds the spider in its two extreme positions.

The operation of the device clearly appears from the above description. At starting the spider D is in the position shown, and only the high-resistance squirrel cage winding *b* is effective. The motor consequently starts with high torque due to the high-resistance of the secondary circuit. When the motor is up to speed the handle F is pushed inward, thereby shifting the spider D toward the rotor core and bringing the contacts *d* into engagement with the contacts *c*. The low-resistance portion of the rotor winding is thereby short-circuited and the motor operates with a low-resistance secondary circuit.

Although I have shown the rotor provided with a winding of two separate portions of high and low resistance respectively, it will be understood that my invention in its broader aspect is not limited to such an arrangement, but may be used to advantage in a motor having any desired arrangement and connections of the rotor winding.

What I claim as new and desire to secure by Letters Patent of the United States, is,

1. In an induction motor, a laminated rotor body provided with tunnels, a winding carried thereby, and switch contacts inclosed within the tunnels, and connected in the circuit of said winding.

2. In an induction motor, a laminated rotor body provided with tunnels, a winding carried thereby, switch contacts inclosed within the tunnels and connected with said winding, and relatively-movable contacts adapted to engage the first-mentioned contacts.

3. In an induction motor, a laminated rotor body provided with tunnels, a winding carried thereby, switch contacts inclosed within the tunnels connected in circuit with said winding, relatively-movable contacts adapted to engage the first-mentioned contacts, and connections whereby said rela-

tively-movable contacts may be controlled manually while the motor is running.

4. In an induction motor, a rotor winding, a laminated rotor body supporting said winding and provided with tunnels extending axially through the laminations, contacts extending into said tunnels from one end of the rotor and connected to said winding, and axially-movable contacts extending into said tunnels from the opposite end of the rotor.

5. In an induction motor, a rotor winding, a laminated rotor body supporting said winding and provided with tunnels extending axially through the laminations, contacts extending into said tunnels from one end of the rotor and connected to said winding, axially-movable contacts extending into said tunnels from the opposite end of the rotor, and connections whereby said axially-movable contacts may be moved manually while the motor is running.

6. In an induction motor, a rotor winding, a laminated rotor body supporting said winding and provided with tunnels extending axially through the laminations, contacts extending into said tunnels from one end of the rotor and connected to said winding, an axially-movable spider carried at the other end of the rotor, and contacts carried by said spider extending into said tunnels.

7. In an induction motor, a rotor winding, a laminated rotor body supporting said winding and provided with tunnels extending axially through the laminations, contacts extending into said tunnels from one end of the rotor and connected to said winding, an axially-movable spider carried at the other end of the rotor, contacts carried by said spider extending into said tunnels, and connections whereby said spider may be moved manually while the motor is running.

8. In an induction motor, a laminated rotor body provided with tunnels, a high-resistance short-circuited winding and a low-resistance open-circuited winding carried thereby, and switch contacts inclosed within the tunnels arranged and connected to short-circuit said low-resistance winding.

9. In an induction motor, a laminated rotor body provided with tunnels, a high-resistance short-circuited winding and a low-resistance open-circuited winding carried thereby, switch contacts inclosed within the tunnels connected to said low-resistance winding, and relatively-movable short-circuiting contacts adapted to engage the first named contacts.

10. In an induction motor, a high-resistance short-circuited winding, a low-resistance open-circuited winding, a laminated rotor body supporting said windings and provided with tunnels extending axially through the laminations, contacts extending into said tunnels from one end of the rotor and connected to said low-resistance winding, and axially-movable short-circuiting contacts extending into said tunnels from the opposite end of the rotor.

11. In an induction motor, a high-resistance short-circuited winding, a low-resistance open-circuited winding, a laminated rotor body supporting said windings and provided with tunnels extending axially through the laminations, contacts extending into said tunnels from one end of the rotor and connected to said low-resistance winding, an axially-movable spider carried at the other end of the rotor, and short-circuiting contacts carried by said spider and extending into said tunnels.

In witness whereof, I have hereunto set my hand this seventeenth day of February, 1906.

JOHN B. WIARD.

Witnesses:
JOHN A. McMANUS, Jr.,
HENRY O. WESTENDARP.