

No. 697,984.

Patented Apr. 22, 1902.

O. F. CONKLIN & J. L. MILTON.
ELECTRIC MOTOR.

(Application filed Aug. 29, 1901.)

(No Model.)

3 Sheets—Sheet 1.

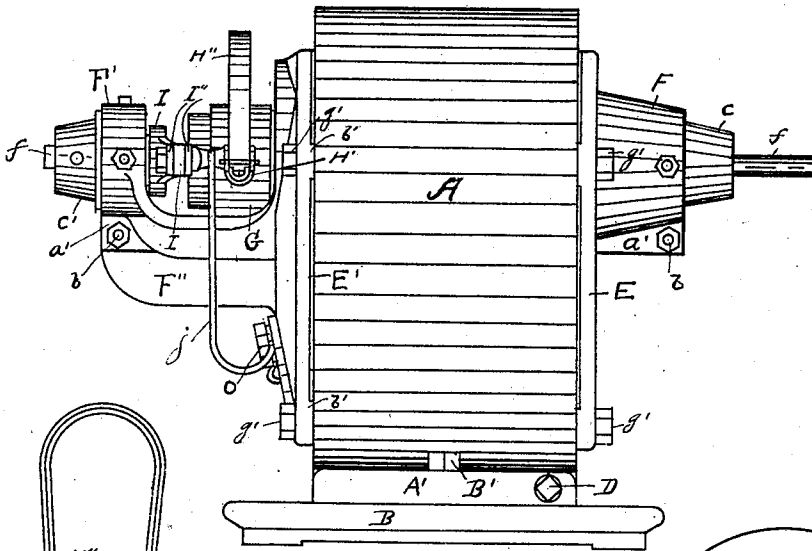


Fig. 1.

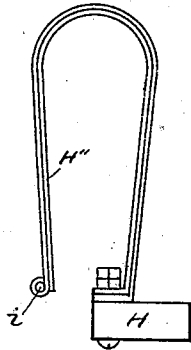


Fig. 7.

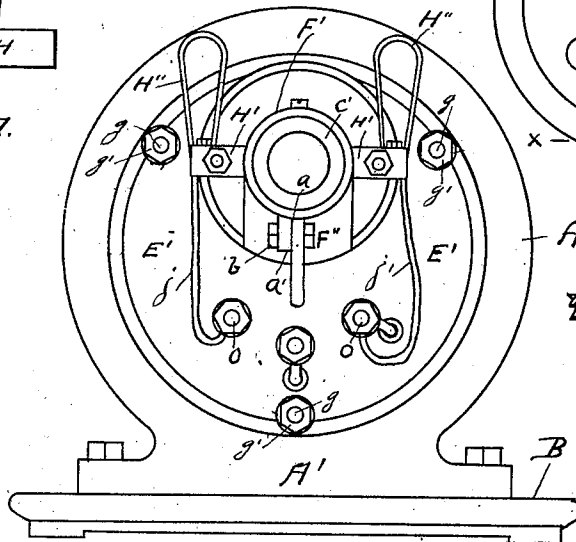


Fig. 2.

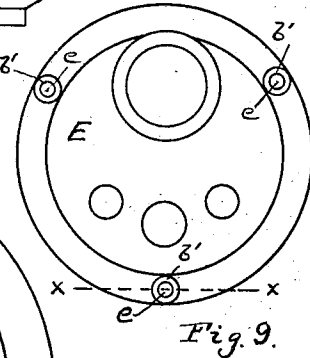


Fig. 9.

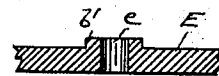


Fig. 10.

WITNESSES.
Matthew Siebler,
c.m. Theobald.

O. F. Conklin
Jno. L. Milton
INVENTORS.
By R. J. Carter,
ATTORNEY.

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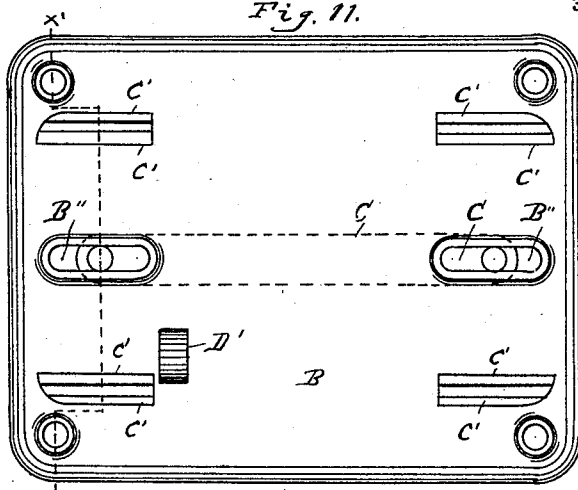


Fig. 11.

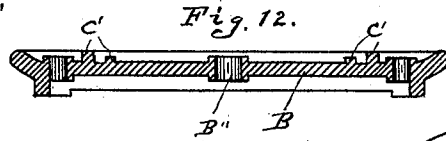


Fig. 12.

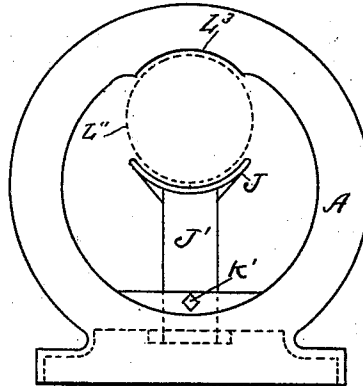


Fig. 13.

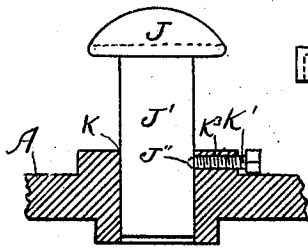


Fig. 8.

WITNESSES.

C. M. Thorbald,
Matthew. Lubber

O. F. Conklin,
J. L. Milton,
INVENTORS.
By R. J. M. Coats,
this ATTORNEY.

UNITED STATES PATENT OFFICE.

OLIVER F. CONKLIN AND JOHN L. MILTON, OF DAYTON, OHIO.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 697,984, dated April 22, 1902.

Application filed August 29, 1901. Serial No. 73,744. (No model.)

To all whom it may concern:

Be it known that we, OLIVER F. CONKLIN and JOHN L. MILTON, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Electric Motors; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to electric motors; and it consists of various improvements in the mechanical construction and arrangement of the motor as a whole, whereby it is simplified and the cost of construction is greatly cheapened, making it an article which meets a long-felt want.

The invention consists in the construction of and manner of uniting the heads to the motor-yoke, in the brush, brush-holder, and brush-spring and the manner of mounting the same, in the construction and manner of mounting the pole-piece of the field-magnet coils, in the base-plate and the manner of mounting the motor thereon.

Preceding a detail description of our invention, reference is made to the accompanying drawings, of which—

Figure 1 is a side elevation of our improved motor. Fig. 2 is an end elevation thereof. Fig. 3 is a top plan view of the brush, brush-holder, brush-spring, commutator, and a bearing. Fig. 4 is an elevation of the motor, showing the side opposite that shown in Fig. 2, the same being removed from the base-plate. Fig. 5 is an enlarged sectional elevation through the lower part of the motor-casing and the base-plate. Fig. 6 is a detail view of the rocker-arm, brush, brush-holder, and brush-spring looking in the direction of the arrow, as is shown in Fig. 3. Fig. 7 is a detached view of one of the brushes and springs, showing the manner of attaching the same. Fig. 8 is a sectional view of the pole-piece, showing the manner of attaching the same. Fig. 9 is a view showing the inner side of one of the heads. Fig. 10 is a sectional view on the line $x-x$ of Fig.

9. Fig. 11 is a plan view of the base-plate. Fig. 12 is a cross-sectional view on line $x'-x'$ of Fig. 11. Fig. 13 is an elevation showing the interior construction of the yoke and active pole-piece.

A designates a cylindrical yoke which terminates in a base A' , which is secured to a base-plate B by means of screws B' , which pass through oblong openings B'' in said plate and thence into a bar C , which fits against the underside of said base-plate. The base of the motor rests on four projected surfaces C' on said base-plate, which form a guide for a proper mounting of the motor thereon, the said guide serving as rails upon which the motor may slide to give it a belt-adjusting feature. D designates a screw engaging with a lug D' on said base-plate and by means of which the motor is shifted along said rails in adjusting the same.

$E E'$ designate heads which inclose the ends of the yoke and which have integral box-bearings F and F' projected therefrom. These projected bearings have slits, as at a , with ears a' , through which a tightening bolt or screw b is passed and whereby the said bearings are clamped around journal-boxes c and c' , that receive the journals of the motor-shaft f . These heads $E E'$ have each three openings e , which are surrounded on the inner side thereof by bosses b' and which receive screw-threaded studs g , projecting from the yoke. By means of these studs and nuts g' the heads are secured to the yoke. The bosses b' are in the inside of the heads and enable said heads to set in a proper manner against the ends of the yoke, thereby avoiding any rocking movement of said heads. These bosses dispense with the necessity of machine-work for the purpose of making the heads fit solidly against the ends of the yoke. Constructing the heads $E E'$ in the manner described gives the heads a firm and solid mounting on the motor-yoke. The openings in said heads and the studs projecting from the motor-yoke are in line with each other and are readily united, thus assuring a correct assembling of the parts comprising the motor-casing.

The bearing F' , it will be seen from Fig. 1, is on the outer end of a bracket F'' , which projects from said head. This is a necessary

feature of the construction in order that the commutator G and the brush-holders H' may have the necessary space.

The brushes H are mounted in the brush-holders H', which are secured to and insulated from a rocker-arm I by means of screws I' and fiber plates I''. The rocker-arm I is split at *h* and is clamped around the inner end of the journal-box *c'* by means of a screw *h'*. The brushes H are pressed inwardly by means of curved springs H'', said springs being compressed, as shown in the drawings, by means of bars *i*, secured to the outer ends thereof, the said bars being inclosed in slots *i'* on the outer ends of the brush-holders.

j and *j'* are conductors which carry current from the binding-posts *o* to the brush-holders.

J designates a single active pole-piece which is entirely incased within the heads and the yoke. This pole-piece has a projecting portion or shank J', which is projected into a suitable opening K in the base of the yoke and is secured thereto by means of a screw K', which passes through a lug on the side of the base (see Fig. 8) and penetrates a cavity J'' in said portion J', whereby the pole-piece is securely attached in position. It may also be stated in connection with this feature of the motor that owing to the manner of attaching said pole-piece and its construction the machine-work thereon is reduced, and the necessity of forming a shoulder thereon to rest upon the casing at K'', Fig. 5, is avoided.

Referring to Fig. 13, the dotted lines L'' represent a cylinder of a desired diameter. This cylinder is placed in the recess L³ in the top of the yoke A, the said yoke being first placed upside down. The pole-piece J' is then lowered until the curved portion J incloses the cylinder L³. The desired position of the pole-piece is thus determined, after which the recess J'' is made by drilling through the hole K³, which set-screw K' afterward occupies. We are thus enabled to quickly and accurately mount the field pole-piece so as not to require machining on the surfaces surrounding the armature, and whereby we are enabled to greatly reduce the expense of construction.

The journal-boxes *c c'* have annular bearing-surfaces *n*, which are rounded in cross-section. These surfaces *n* alone engage with the inner surfaces of the bearings F F'. The boxes are therefore permitted to adjust themselves to the axial diameter of the main shaft *f*.

Having described our invention, we claim—

1. In an electric motor, a casing comprising a cylindrical yoke having three threaded studs projecting from opposite sides thereof, heads inclosing the sides of said yoke each of which has three openings corresponding with the positions of the studs on the yoke, the said openings being surrounded on the inner sides of the heads by bosses which enable said heads to fit properly against the sides of the yoke, the openings in said heads and the studs on the yoke enabling said heads to be

quickly and unerringly placed in proper position on the yoke, substantially as specified.

2. In an electric motor, a motor-casing comprising a cylindrical yoke having three threaded studs projecting from opposite sides thereof, heads E and E' each of which has three openings the positions of which correspond to the positions of said studs, the said openings being surrounded on the inner sides of the heads by bosses for the purposes specified, the head E being provided with an integral cone-shaped clamp-bearing adapted to receive a journal-box, the head E' being provided with a bracket projecting therefrom which terminates in a clamp-bearing also adapted to receive a journal-box, substantially as specified.

3. In an electric motor, the combination with a yoke having three screw-threaded studs projecting therefrom, of heads provided with three stud-openings surrounded by bosses on the inner sides of said heads, the said stud-openings being in line with the screw-threaded studs on the yoke, integral clamp-bearings projected from said heads, and journal-boxes secured within said clamp-bearings, the said journal-boxes having annularly-projected surfaces rounded in cross-section and which portions engage with the interior surface of said clamp-bearings, whereby the said journal-boxes are permitted to adjust themselves to the proper axial diameter of the main shaft, substantially as specified.

4. In an electric motor, the combination with a yoke having three screw-threaded studs projecting therefrom, heads provided with three stud-openings surrounded by bosses on the inner sides of said heads, the said stud-openings being in line with the screw-threaded studs on the yoke, integral clamp-bearings projected from said heads, and journal-boxes secured within said clamp-bearings, the said journal-boxes having annularly-projected surfaces rounded in cross-section and which portions engage with the interior surface of said clamp-bearings, a rocker-arm clamped to one of said journal-boxes, and brush-holders secured to said rocker-arm, all arranged substantially as specified.

5. In an electric motor, the combination with a yoke having an opening in the base thereof of uniform diameter, of a pole-piece having a shank or body portion of uniform diameter throughout and which is adapted to enter said opening in the yoke, the said shank or body portion of the pole-piece having a recess in a side thereof, the said recess being provided after the pole-piece has been adjusted to its proper position, and a screw adapted to penetrate laterally the yoke and enter the recess in said pole-piece, substantially as specified.

6. In an electric motor, the combination with a motor-yoke, of a single active pole-piece, the shank or body portion thereof being of uniform diameter throughout and adapted to enter an opening of similar diameter in

the base of said yoke, means for securing said pole-piece in position after it has been adjusted to its proper position, and heads inclosing the sides of the motor-casing, the pole-piece being entirely incased within the motor-yoke and said heads.

7. In an electric motor, the combination with a yoke, of a base-plate upon which said yoke is mounted, the said base-plate being provided with four guide-surfaces which insure a proper mounting of the yoke thereon, oblong openings in said base-plate, screws penetrating the base of the yoke and passing through said oblong openings, a bar below

the base-plate to which said screws are connected, and a horizontal adjusting-screw mounted on the top of the base-plate and adapted to shift the motor-casing to adjust it to proper positions, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

OLIVER F. CONKLIN.
JOHN L. MILTON.

Witnesses:

R. J. McCARTY,
C. M. THEOBALD.