

No. 660,713.

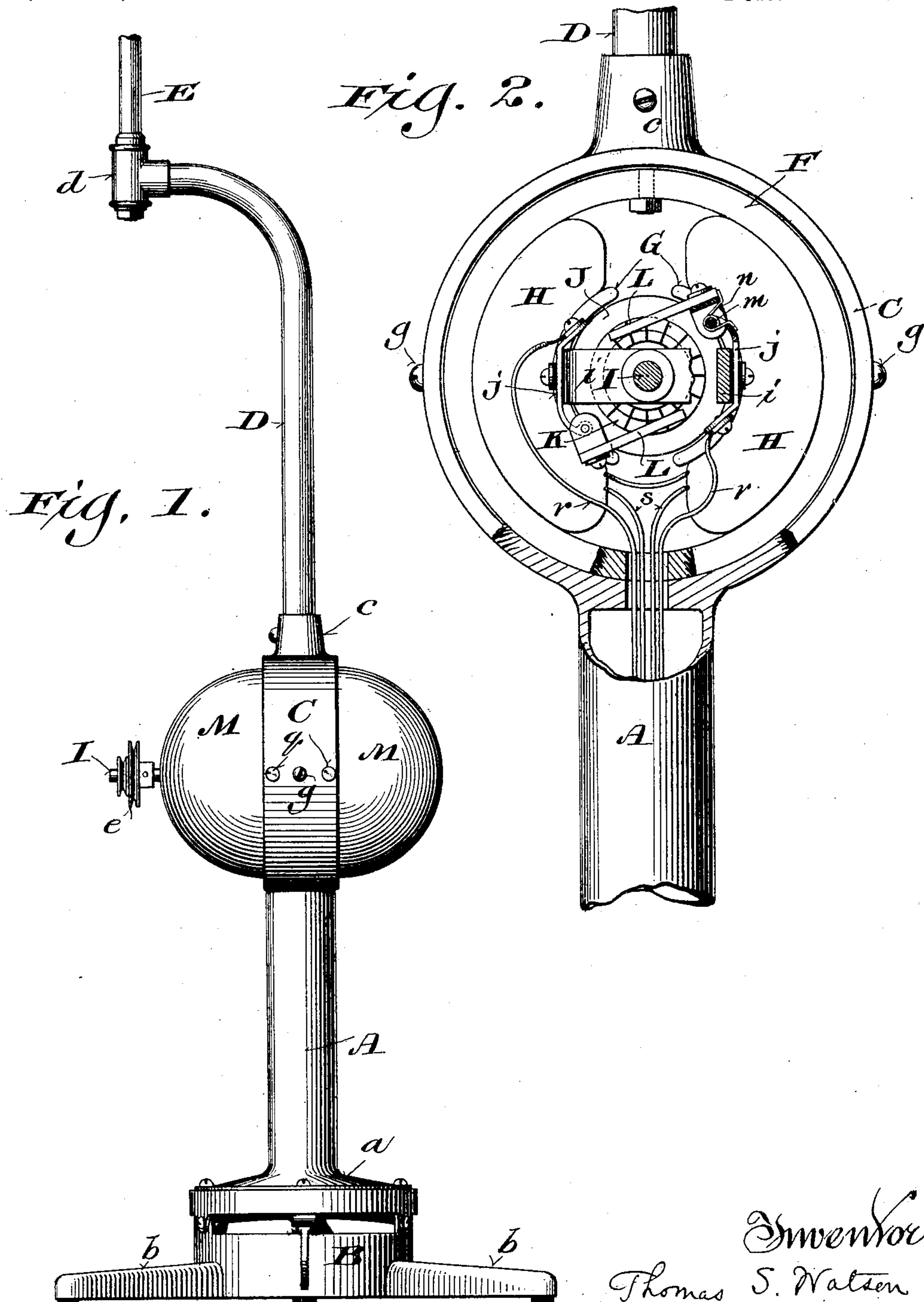
Patented Oct. 30, 1900.

T. S. WATSON.  
ELECTRIC MOTOR.

(Application filed Oct. 4, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.  
Geo. W. Young.  
B. C. Roloff

By

Inventor:  
Thomas S. Watson

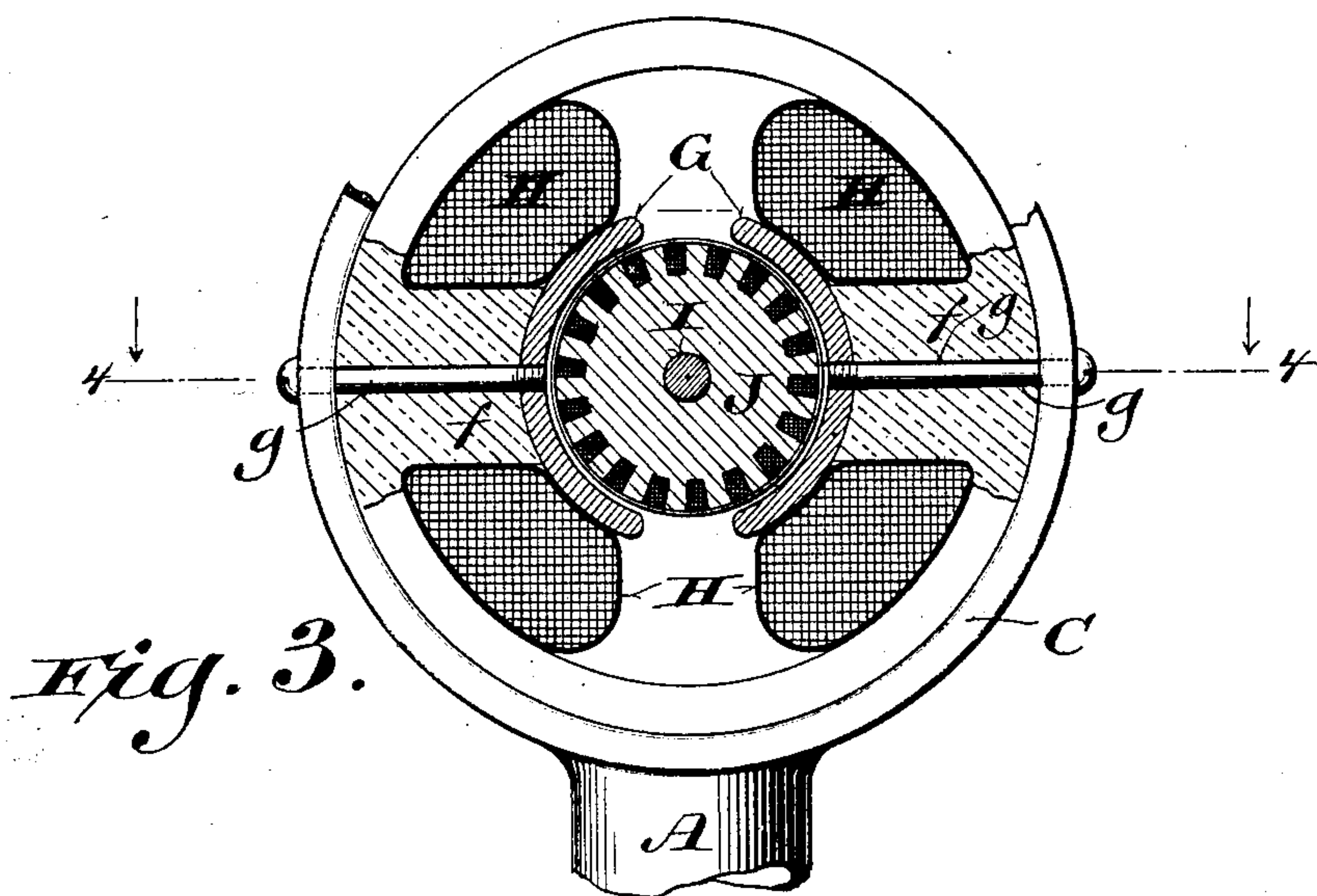
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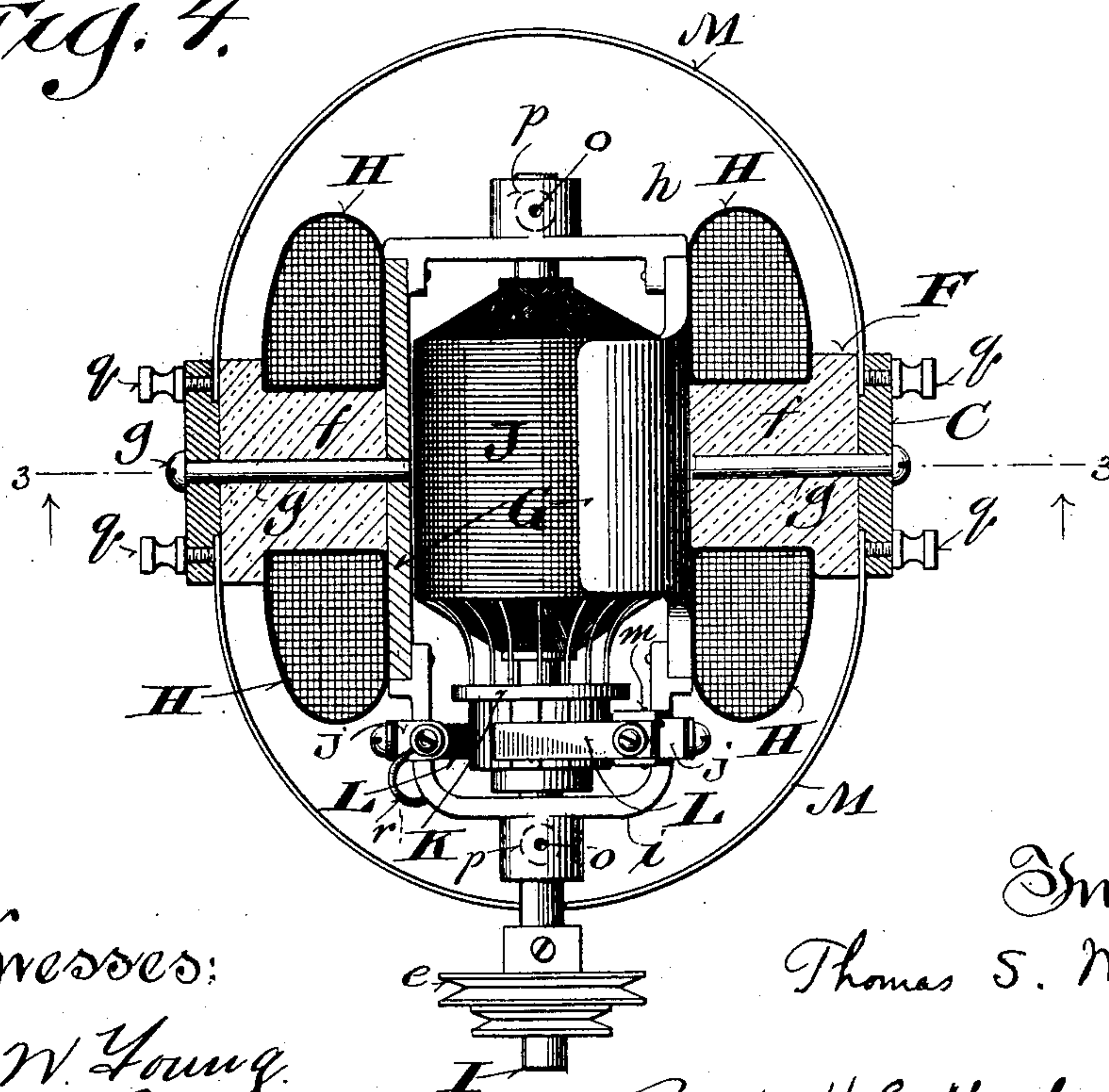
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2 Sheets—Sheet 2.



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

THOMAS S. WATSON, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE  
BROWNING MANUFACTURING COMPANY, OF SAME PLACE.

## ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 660,713, dated October 30, 1900.

Application filed October 4, 1899. Serial No. 732,442. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS S. WATSON, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Electric Motors; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has especial reference to that class of electric motors particularly designed for the operation of rotary dental tools, although not necessarily restricted thereto; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a front elevation of my motor arranged in a suitable standard in connection with a controlling device for operating a dental engine. Fig. 2 is an end view of said motor with its protecting-shell removed, showing also part of the supporting-standard in section and drawn to an enlarged scale. Fig. 3 is a sectional view of said motor, taken on the line 3 3 of Fig. 4. Fig. 4 is another sectional view of said motor, taken on the line 4 4 of Fig. 3.

Referring by letter to the drawings, A represents the supporting-standard, consisting of a hollow shank terminating in a flat base-plate *a*, which rests upon the upper surface of an electric-motor-controlling device or switch apparatus B, to which the said base-plate *a* is secured by screws, as shown, the controlling device B having suitable legs *b b*, which thus become the legs or supports of the motor-standard A. At its upper end the said standard A is expanded into a ring C, having a socket *c* at the top for the reception of an arm D, which in turn at its upper end is formed with a socket *d* to receive the lower end of the rod E, designed for the support of the usual flexible shaft (not shown) of a dental engine rotated by a belt (also not shown) from a pulley *e* on the hereinafter-described armature-shaft I.

Fitting within the standard-ring C is the annular frame F of my field-magnet, formed integrally with the shanks *f f* of the pole-pieces G G, the latter being made separate

and independent from the pole-shanks, to which they are afterward secured by the screws *g g*, as hereinafter explained.

H H indicate the field-coils fitting around the pole-shanks *f f*, as shown. The opposed ends of the pole-pieces G G are secured together by the connecting-pieces *h i*, which are made, preferably, of brass or other non-magnetic material and formed with central hubs for the reception of the shaft I of the armature J and its commutator K. The connecting-piece *i* has two metallic strips *j j* connected thereto, one on each side, but insulated therefrom, as shown.

L L indicate brushes for engagement with the commutator K, which brushes are pivotally attached one to each of the said strips *j*, as shown best at *m* in Fig. 2, and held against said commutator by springs *n*. The hubs of the connecting-pieces *h i* are provided with holes *o o*, whereby the shaft I is lubricated by means of oil-cups, (indicated by the dotted circles *p p*.)

In assembling my motor after the field-coils H H have been slipped to place upon the pole-shanks *f f*, the armature J, commutator K, and shaft I, with the pole-pieces G G, connecting-pieces *h i*, and brushes L L, are slipped to place, with the screw-threaded bores in the said pole-pieces in line with the bores through the pole-shanks *f f* and ring C of the standard A, and then the screws *g g* are inserted and tightened. Next the semispherical shells M M are adjusted to place, inclosing the motor, as shown in Fig. 1, one of said shells having a central hole for the passage of the shaft I therethrough. The described ring C is undercut on its opposite edges for the reception of the adjacent edges of the said shells M M, which are then fastened securely by means of the screws *q q*, passing through said ring C and clamping the shells against the described annular frame F of the field-magnet. Then the pulley *e* is secured to the projecting end of the shaft I.

As heretofore stated, the standard A is hollow, and the conducting-wires pass up through the same from the controlling device B and through openings in the ring C and annular frame F, all as shown best in Fig. 2, the wires *r r* leading to the strips *j j* and the wires *s s*



to the field-coils H H and being properly connected, as shown, all of said conducting-wires being thus concealed and protected within the standard of the motor.

5 The electric-motor-controlling device or switch apparatus B may be of any suitable or preferred construction, with the usual cable leading from the source of electric supply and with conducting-wires leading up to the  
10 motor, as just explained; but by having the said conducting-wires all extending up within the hollow standard and by having the latter mounted upon the controlling device, as shown in Fig. 1, a much neater and more compact and convenient device is produced than  
15 where the controller is located at a distance from the motor-support and connected thereto by exposed cables.

Having thus described my invention, what  
20 I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a suitable hollow standard expanded into a ring at its upper end, said ring being undercut on each inner  
25 edge, of an annular magnet-frame, comprising a continuous metal ring having opposed inner shanks integral therewith, fitted within the said standard-ring, field-coils on said shanks, separate curved pole-pieces secured  
30 to said shanks by screws passing therethrough and through both of said rings; connecting-pieces uniting the opposed ends of said pole-pieces, a shaft journaled in said connecting-pieces, an armature and commutator on said  
35 shaft, insulated metallic strips secured to one of said connecting-pieces, spring-controlled commutator-brushes hinged to said strips, series of conducting-wires leading up through said hollow standard, and connected, respec-

tively, to said strips, and to said field-coils, 40 and semispherical shells clamped between the annular magnet-frame and the standard-ring, one of said shells having a central aperture for the passage of the armature-shaft there-  
45 through.

2. In an electric motor for rotary dental tools and the like, the combination with a hollow standard expanded into a ring at its upper end, a motor having an annular magnet-frame fitting within the ring of the standard, 50 conducting-wires leading up through said hollow standard and connected to said motor, and semispherical shells fastened to said standard-ring and inclosing said motor, one of said shells having a central aperture for the pas- 55 sage of the shaft of the motor therethrough.

3. In an electric motor for rotary dental tools and the like, the combination with a motor-controlling device, of a hollow standard secured to and rising from said controlling 60 device and expanded into a ring at its upper end, a motor having an annular magnet-frame fitting within the ring of the standard, conducting-wires leading up from said controlling device through the hollow standard and 65 connected to said motor, and semispherical shells fastened to said standard-ring and inclosing said motor, one of said shells having a central aperture for the passage there-  
70 through of the motor-shaft.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

THOMAS S. WATSON.

Witnesses:

H. G. UNDERWOOD,  
B. C. ROLOFF.