

(No Model.)

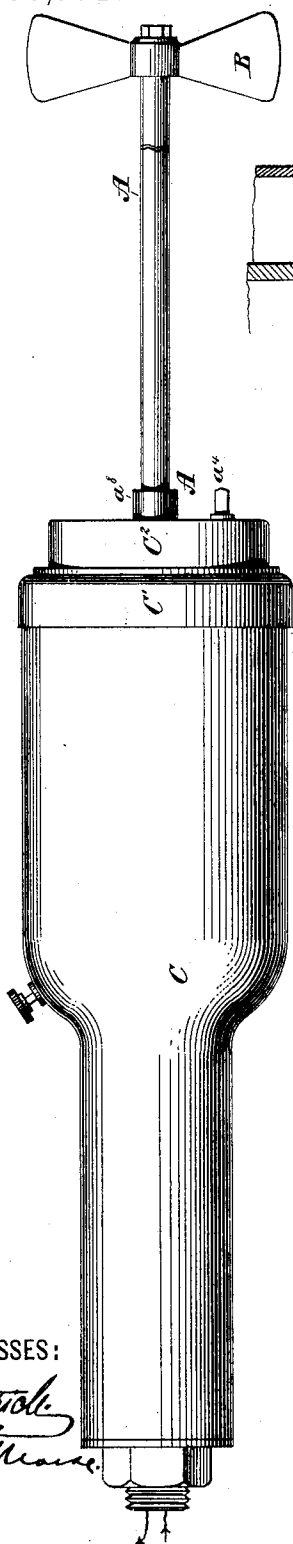
2 Sheets—Sheet 1.

M. B. PENGNET.
ELECTRIC MOTOR.

No. 595,731.

Patented Dec. 21, 1897.

Fig. 1.



WITNESSES:
Edw. J. Moore
Geo. C. Moore

Fig. 2.

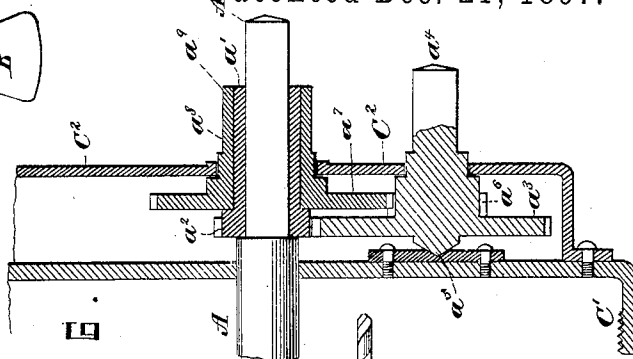
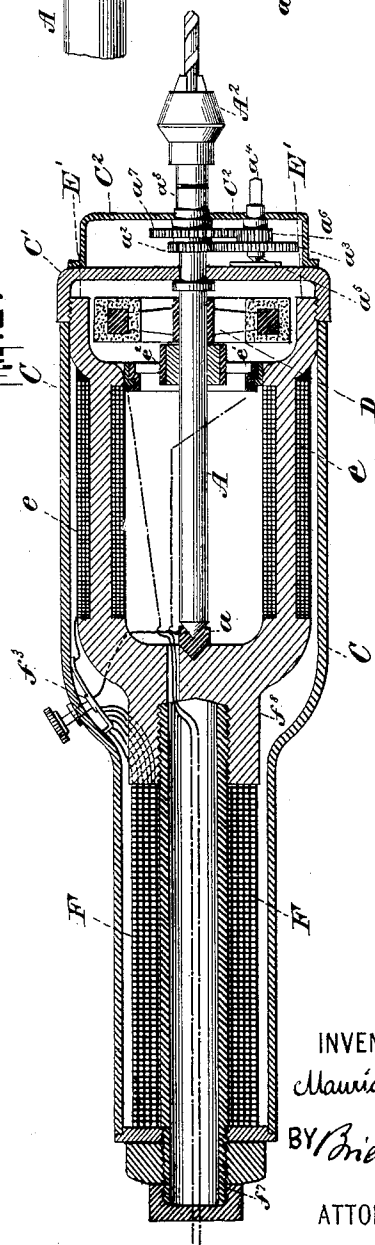


Fig. 3.



INVENTOR
Maurice B. Pengnet
BY *Brisson & Hough*
ATTORNEYS

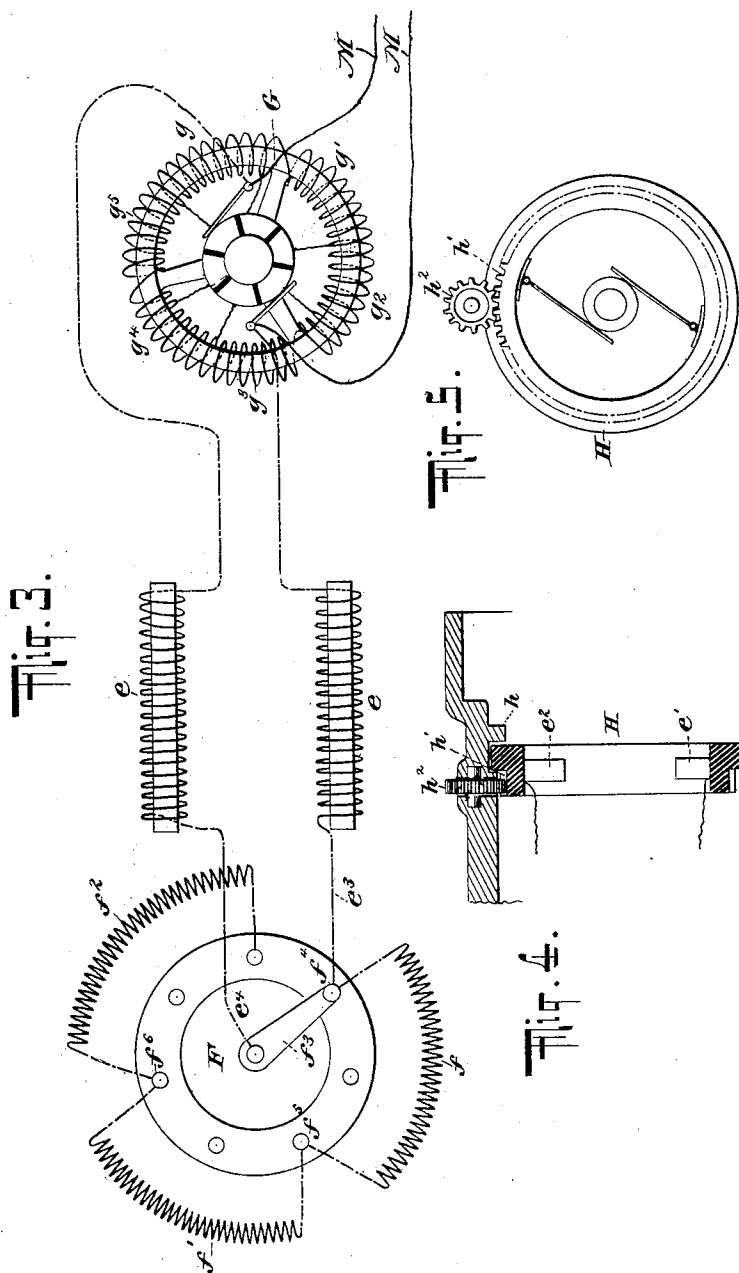
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2 Sheets—Sheet 2.

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WITNESSES:

Gustav Dietrich
Ed. E. Moore

INVENTOR

Maurice B. Pengnet

BY *Briesen Thumt*

ATTORNEYS

UNITED STATES PATENT OFFICE.

MAURICE B. PENGNET, OF CAMBRIDGE, MASSACHUSETTS.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 595,731, dated December 21, 1897.

Application filed March 31, 1897. Serial No. 630,077. (No model.)

To all whom it may concern:

Be it known that I, MAURICE B. PENGNET, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Motors for Small Work, of which the following is a specification.

My invention relates to electric motors, and has for its object to produce a high-speed motor designed especially for driving egg-beaters, drills, jewelers' lathes, and such small work.

To this end my invention consists in the construction hereinafter set forth and claimed.

My invention will be understood by referring to the accompanying drawings, which show a structure embodying the said invention.

In the drawings, Figure 1 is a side elevation of the motor applied to a mixer. Fig. 2 is a longitudinal section thereof, showing the motor applied to a drill. Fig. 3 is a diagrammatic view of the motor-circuits. Fig. 4 is a detail sectional view of the brush-adjusting device. Fig. 5 is an end view of the same, and Fig. 6 is an enlarged detail view of an apparatus for deriving different speeds from the motor.

In the drawings, A is the motor-shaft, shown in Fig. 1 as provided with a stirrer B.

The armature D of the motor is in the form of a ring and is carried upon the shaft A, which is stepped at a on the head f^3 , uniting the pole-pieces. Coöperating with the armature D are pole-pieces E' E' , provided with suitable windings e , in shunt to the brushes e' e^2 of the machine, as will clearly appear from Fig. 3, and connected in series with a speed-regulator F by wires e^3 e^4 . This speed-regulator F, as will be observed, consists of several regulator-coils f' f^2 , which may be put in series *seriatim* with the field-coils by an arm f^3 , which is connected to the wire e^4 and contacts successively with the contact-pieces f^4 , f^5 , and f^6 of the speed-regulator. The speed-regulator coils are shown as mounted upon a sleeve f^7 , which is screwed into the head f^3 , carrying the bearing a and from which the pole-pieces E' E' branch. The armature is connected to feed-wires M M and wound with serially-connected coils g' g^2 g^3 g^4

g^5 , which are connected to the commutator in the usual manner.

Referring to Figs. 2 and 4, it will be observed that the brushes e' e^2 coöperate with the commutator in the usual manner and are carried in an ebonite ring H, which is seated between the pole-pieces, on the inner faces thereof, and secured in place by a keeper h . This ebonite ring is revoluble and is provided on a part of its circumference with teeth h' , with which a cog-wheel regulator h^2 meshes, so that the brushes may be adjusted by turning the cog-wheel to rotate the ebonite ring H. A casing C surrounds the regulator and motor. Another casing C' is secured on the pole-pieces E' and carries another casing c^2 , which incloses the mechanism for taking various speeds from the motor. The whole is of a general bottle shape.

Referring particularly to Fig. 6, it will be noted that the shaft A ends in a tool-engaging squared portion A' , which passes through a sleeve a' , carrying a cog-wheel a^2 , which meshes with a gear a^3 , rigid with a shaft a^4 . This shaft a^4 is hung in the casing C^2 , provided with a tool-engaging end and stepped at a^5 , and likewise provided with a gear a^6 , which meshes with a gear a^7 , carried on a sleeve a^8 , squared at a^9 to engage a tool, so that by putting a clutch A^2 or other apparatus for holding drills or small tools on the shaft A' the said clutch will be driven at the speed at which the motor is running. By putting the said clutch on the shaft a^4 the clutch will be driven at a slower speed, and by putting the clutch on the sleeve a^9 the said clutch will be driven at a still slower speed, so that several speeds may be derived from the same shaft. The motor may be driven at a very high speed, and the small sizes of the motor operate very economically and are of such a form as to be readily portable.

It will be observed that the motor and the tool-engaging devices constitute one rigid structure, so that the motor may be carried about and used in various situations where a motor of small power is desirable.

What I claim, and desire to secure by Letters Patent, is—

1. In a portable motor for small work, the combination of a bottle-shaped casing C, a

field-magnet comprising a head f^8 , pole-pieces E' branched therefrom, regulator-coils F carried upon an extension of the head and an armature working between the pole-pieces.

5 2. In a motor, the combination of a field-magnet having a plurality of poles with inner opposed faces, a movable ring seated in the said inner opposed faces of the field-magnet so as to be supported by both of the said
10 poles, and brushes carried by the said ring and extending inward to the commutator.

3. In a motor for small work, the combination of a field-magnet comprising a head f^8 , pole-pieces E' branching therefrom, a ring-armature interposed between the pole-pieces,
15 a pinion a^2 carried by the shaft of the motor, a shaft a^4 carrying a pinion a^3 meshing with the pinion a^2 and a pinion a^6 , a sleeve a^8 surrounding the shaft of the motor and carrying
20 a gear a^7 , the said shaft of the motor-sleeve a^8 and shaft a^4 being prismatic for a part of their lengths, substantially as described and for the purposes set forth.

4. In a motor for small work, the combination of a bottle-shaped casing C , a head f^8 , pole-pieces E' branched from the said head in one direction, an extension f^7 of less diameter than the said head and projecting from the said head in an opposite direction
30 into the narrow portion of the bottle-shaped casing, a regulator-coil F surrounding the said extension and contained within the casing, an armature, an armature-shaft interposed between the pole-pieces, and a brush-
35 adjusting device comprising a rotary ring

seated in the inner faces of the pole-pieces and carrying brushes projecting inward, substantially as described and for the purposes set forth.

5. A portable electric motor for small work 40 combined with a plurality of independent tool-engaging means rigidly secured thereto so that the motor and tool-engaging means constitute one rigid structure, individual tool-engaging means being driven at different 45 rates of speed by the said motor, substantially as described.

6. The combination of a portable motor for small work, a casing enveloping and surrounding the same, and a plurality of independent tool-engaging means extending outside of the casing through apertures therein, and means for driving individual tool-engaging means at different rates of speed, the said means intervening between the motor 55 and tool-engaging means, substantially as described.

7. In a portable motor for small work, the combination of a bifurcated field-magnet having a head uniting the pole-pieces and provided with an extension carrying resistance-coils, an armature-carrying shaft stepped upon the said head and extending between the pole-pieces, and a bearing for supporting the outer end of the said shaft, substantially 65 as described and for the purposes set forth.

MAURICE B. PENGNET.

Witnesses:

GEO. W. RYAN,
P. W. HEFFERN.