No. 815,444. PATENTED MAR. 20, 1906.

F. E. LEWIS.

MOTOR.

APPLICATION FILED JUNE 15, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

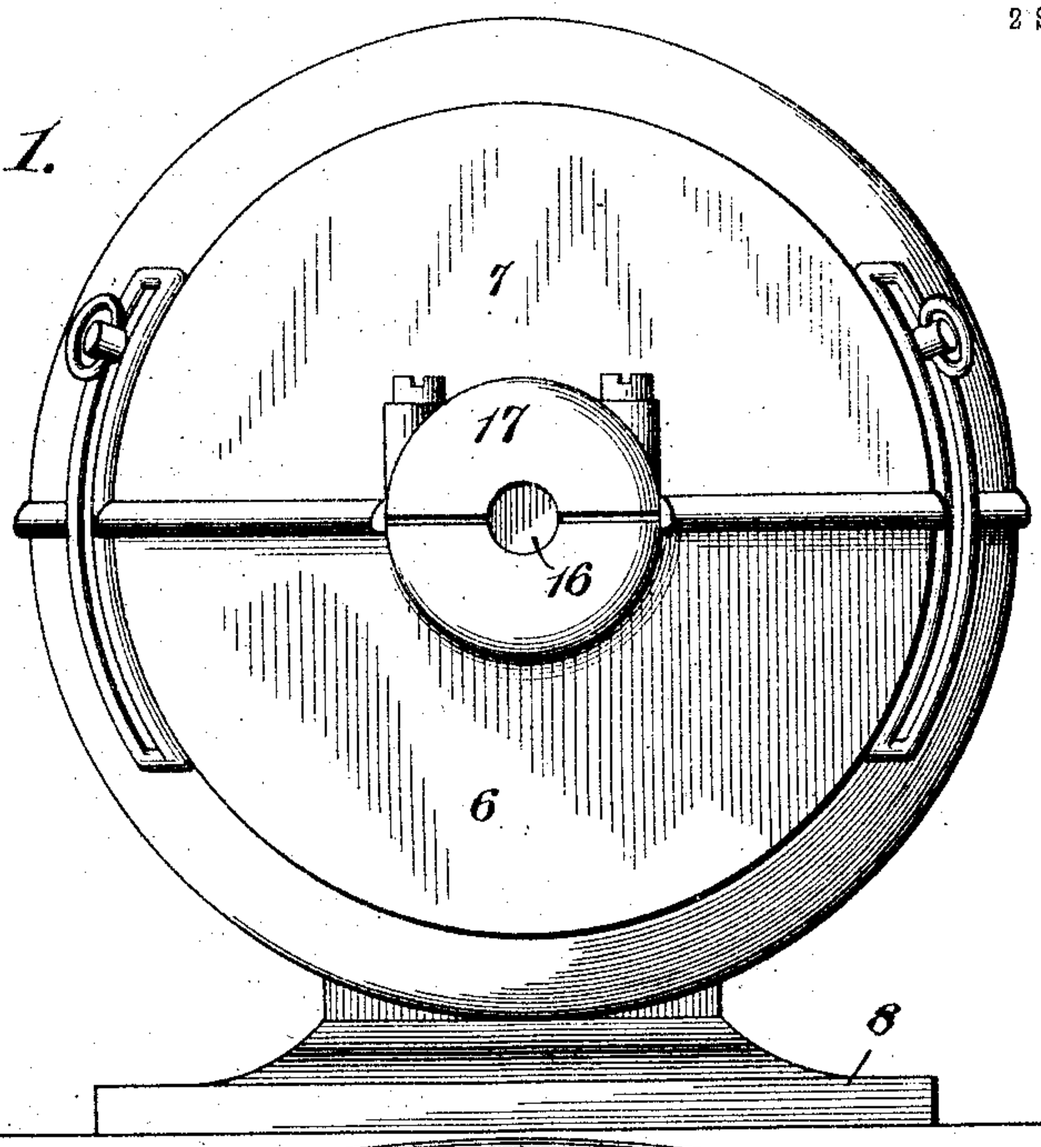
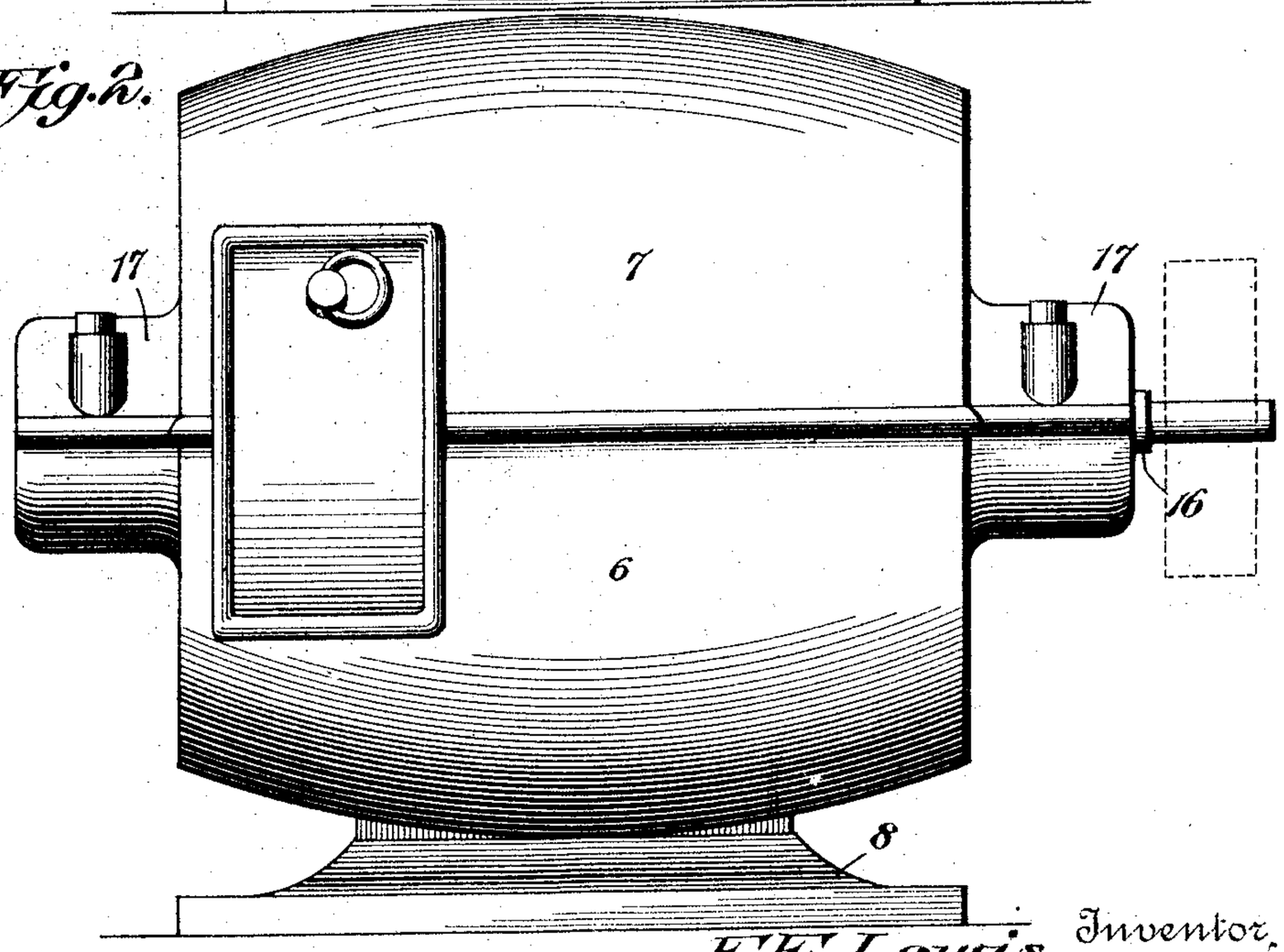


Fig. 2.



Witnesses

Howard D. Orr.

B. L. Foster.

Inventor,

F. E. Lewis,

By E. G. Siggers.

J. B. Siggers

Attorneys.

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2 SHEETS—SHEET 2.

Fig. 3.

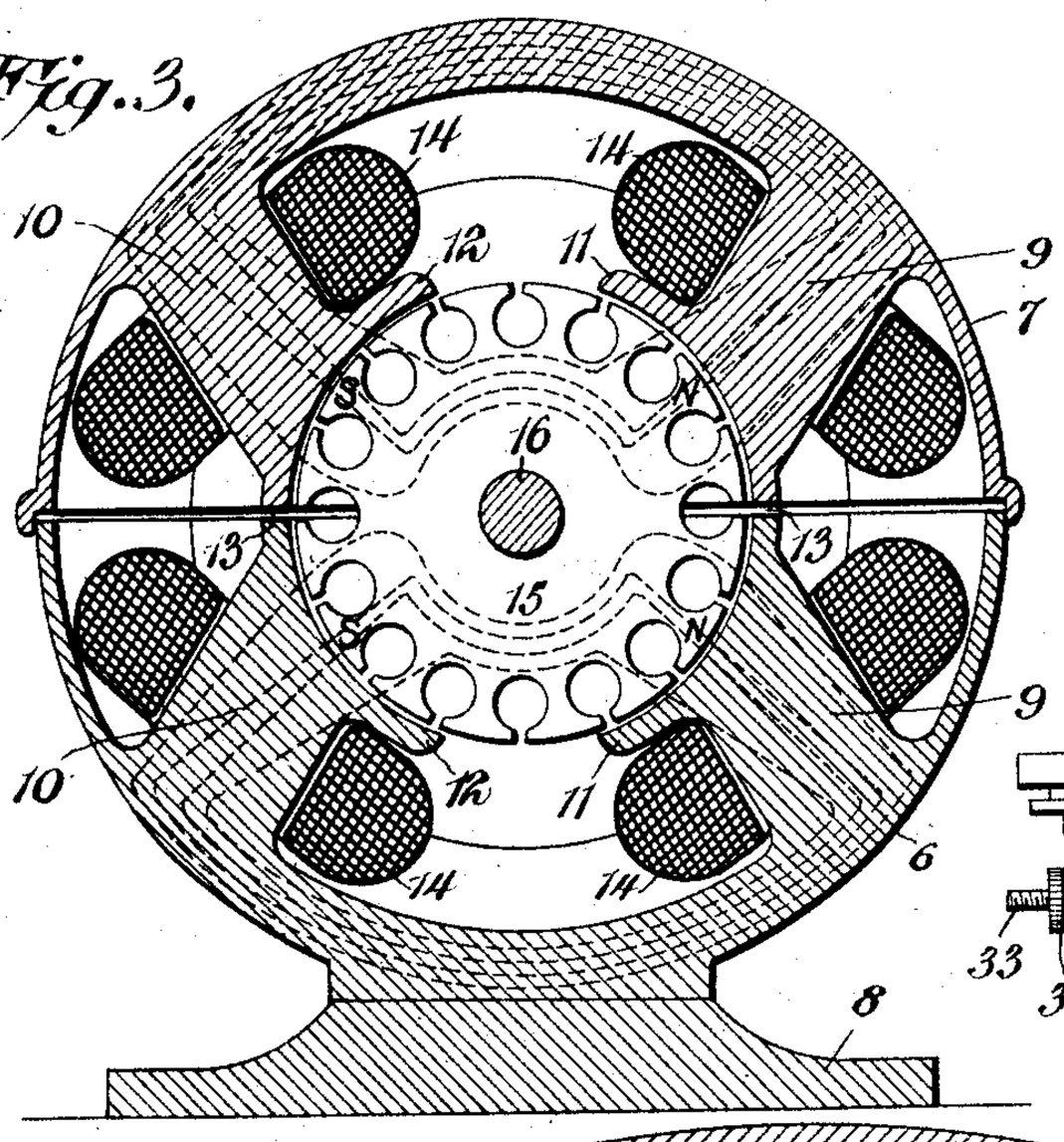


Fig. 5.

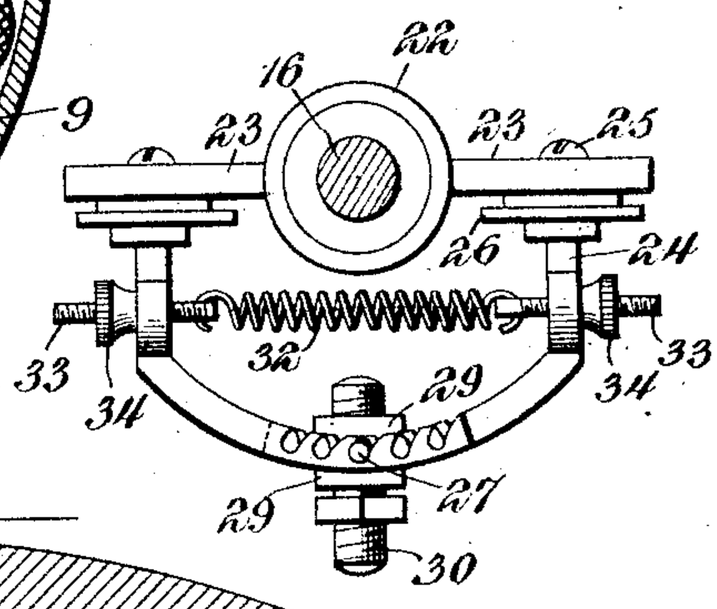
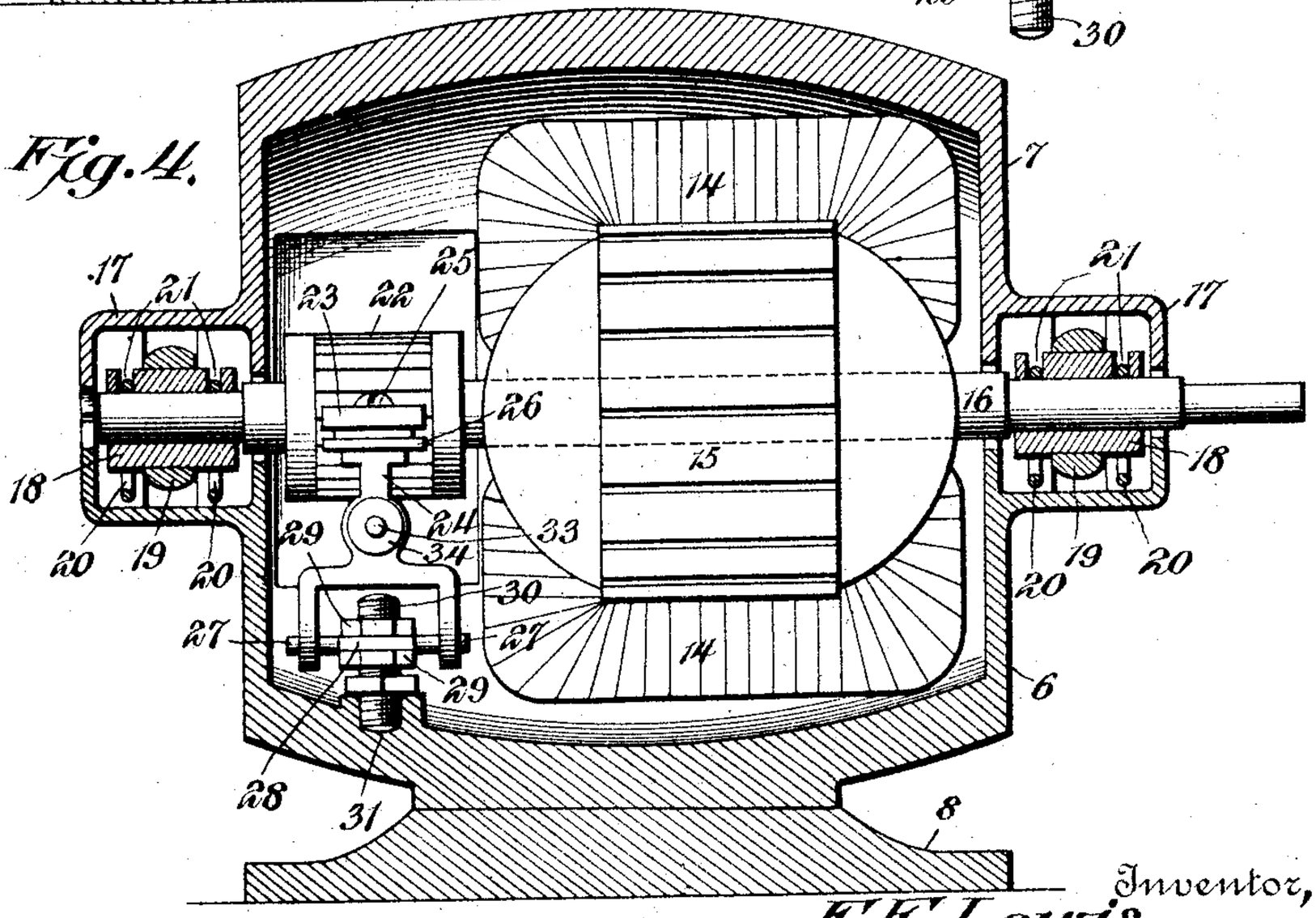


Fig. 4.



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Attorneys

UNITED STATES PATENT OFFICE.

FRANK E. LEWIS, OF TROY, OHIO, ASSIGNOR OF ONE-HALF TO W. EDGAR JOHNSON, OF TROY, OHIO.

MOTOR.

No. 815,444. Specification of Letters Patent. Patented March 20, 1906.

Application filed June 15, 1905. Serial No. 265,449.

To all whom it may concern:

Be it known that I, FRANK E. LEWIS, a citizen of the United States, residing at Troy, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Motors, of which the following is a specification.

This invention relates more particularly to that type of motor known as "bipolar" motors.

One of the principal objects is to provide a novel motor wherein the poles are divided up into sections so arranged that the distortion of the lines of force in the poles, due to the armature reaction, is very materially reduced if not entirely prevented.

Another important object is to provide an exceedingly simple but effective structure the parts of which may be readily manufactured without the necessity of any great amount of machine-work, and, furthermore, may be readily assembled or disassociated.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is an end elevation of the motor. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-sectional view. Fig. 4 is a vertical longitudinal sectional view, and Fig. 5 is an end elevation of the commutator.

Similar reference-numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated a substantially barrel-shaped casing is employed, preferably formed of two sections 6 and 7, the former constituting a base having a supporting-foot 8 suitably secured thereto, the latter constituting a cap suitably secured upon the base-section. The casing is provided with integral salient opposite or unlike poles, and each of said poles consists of two distinct cores, the cores of one of the poles being designated 9 and those of the other 10. It will be observed by reference to Fig. 3 that one core of each pole is carried by each of the casing-sections and is formed integral therewith. Thus each casing-section is provided with unlike cores. The distance between these unlike cores is considerably greater than the distance between the like cores, and said like cores are disposed in convergent relation, the points of convergence of the like and of the unlike cores being different. The inner ends of the various cores are provided with heads 11 and 12, the inner faces of which are concentrically disposed. By referring to Fig. 3, it will be noted that the opposite edges or portions of the heads of the like cores are arranged directly contiguous to each other, being separated slightly by air-gaps 13, the outer sides of said heads being spaced a considerable distance from the unlike heads. Suitable coils 14 are located on the various cores, and coacting with the poles is an armature 15, which may be of any suitable form and construction, said armature being mounted on a shaft 16, that extends through boxings 17, located at the ends of the casing and partially on each section thereof. The bearings for the shaft consist of sleeves 18, located in the boxings 17, which sleeves are held in place by Babbitt metal 19. Rings 20, supported by the shaft, operate in slots 21 in the sleeves 18 and serve to carry oil or lubricant from the bottoms of the boxings 17 to the shaft-bearings.

Any suitable type of commutator may be employed in connection with the motor. In order to show a complete structure, a desirable form is illustrated consisting of a ring 22, with which brushes 23 coact. These brushes are secured to supports 24, to which they are fastened by screws 25 and from which they are insulated by disks 26. The supports are in the form of brackets pivotally supported on outstanding gudgeons 27, carried by a collar 28, mounted between adjusting-nuts 29, said nuts being threaded upon a spindle 30. The spindle is fixed, as shown at 31, in the lower portion of the casing. The supports 24 are yieldingly drawn toward each other by a coiled spring 32, the opposite ends of which are connected to threaded shanks 33, slidably passing through the supports and having screwed on their outer ends adjusting-nuts 34, by means of which the tension of the spring may be varied. This structure may be altered and changed as desired, as may also the type of armature.

The structure disclosed enables the use of an armature of comparatively large diameter because the field-windings are distributed. Consequently comparatively great output per weight of machine is secured. Moreover, short pole-pieces and magnetic yokes with a great polar embrace are provided. The field excitation is smaller and the motor

is less susceptible to field distortion resulting from the armature reaction. This will be apparent when it is considered that the pole-pieces are each composed of two sections or parts separated by the air-gaps 13, so that the crowding effect or distortion is very slight, as a considerable reluctance or resistance is introduced through the central portions of the poles. Moreover, it will be noted by the showing of the lines of force in Fig. 3 that each half of the casing and poles have independent circuits and no lines are required to pass through the casing at the joints between the sections, thereby requiring no machine-work or exact fitting. Moreover, the parts can be very readily manufactured and assembled and, on the other hand, may be easily disassociated should it become necessary to repair or renew any of them.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. A motor comprising a sectional casing, opposite field-poles, each pole comprising a plurality of independent cores and heads, the heads of each pole being disposed in close relation but being entirely separate and said cores being respectively carried by different sections of the casing, a separate winding for each core of each pole, and an armature cooperating with the heads.

2. A motor comprising a sectional casing, opposite field-poles, each of said poles comprising a plurality of convergently-disposed cores carried respectively by the different sections of the casing and having enlarged heads at their inner ends, the heads of each pole having their opposed portions located directly adjacent each other but entirely independent and slightly spaced apart, a separate coil surrounding each core, and an armature rotating between the opposite field-poles.

3. A motor comprising a two-part sectional casing, opposite salient poles carried by the casing, each of said poles consisting of a plurality of separate convergently-disposed cores having independent spaced but coacting heads, each casing-section having cores of the opposite poles, the distance between the unlike cores carried by the same section being greater than the distance between the like cores carried by the different sections, a separate coil surrounding each core, and an armature coöperating with and located between the heads of the poles.

4. In a motor, the combination with opposite field-poles, each of said poles comprising a plurality of convergently-disposed cores having independent spaced heads, the cores of the different poles converging toward different spaced points, of an armature coöperating with the different poles and having its axis of rotation located between said points of convergence.

5. In a motor, the combination with opposite field-poles, each of said poles comprising a plurality of convergently-disposed cores, the cores of the different poles converging toward spaced points and having independent heads at their inner ends, said heads being provided with concentrically-disposed inner surfaces, of an armature rotating between the different poles and having its axis of rotation located between the points of convergence of the cores.

6. In a motor, the combination with a two-part casing, of opposite field-poles carried by the casing, each pole comprising a plurality of convergently-disposed cores, the cores of the different sets converging toward spaced points, heads located at the inner ends of the various cores and having concentrically-disposed inner surfaces, the heads of each pole being separate from each other, each of said casing-sections having cores of the opposite poles, the distance between the unlike cores carried by the same section being greater than the distance between the like poles carried by the different sections and the heads of said like poles being slightly separated, a separate coil surrounding each core, and an armature journaled in the casing and coöperating with the concentric faces of the heads, the axis of rotation of the armature being disposed between the points of convergence of the cores and in the same plane therewith.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK E. LEWIS.

Witnesses:
C. C. HOBART,
H. K. KIRK.