H. L. PITMAN.

SPRING MOTOR.

APPLICATION FILED MAR. 4, 1912.

1,076,314.

Patented Oct. 21, 1913.

4 SHEETS—SHEET 1.

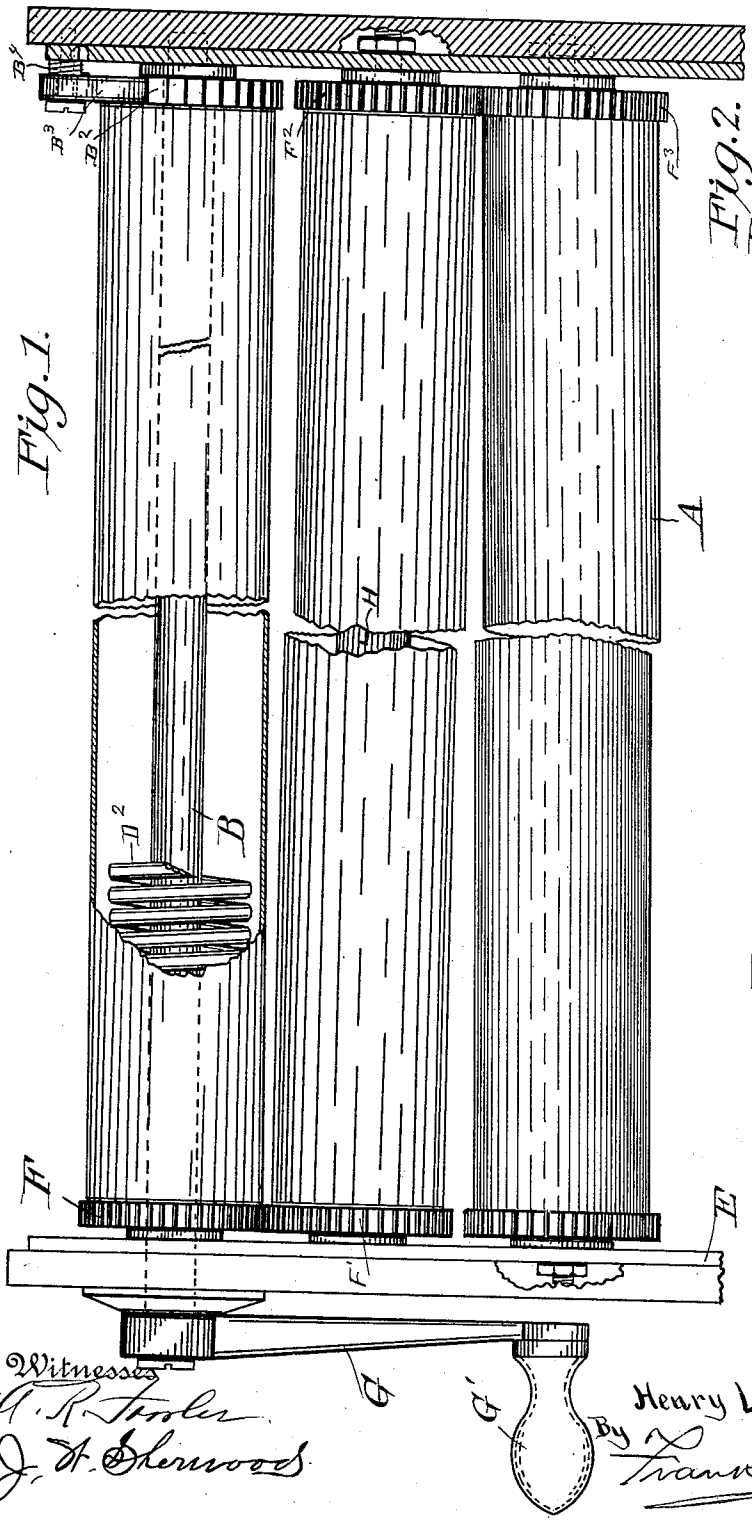


Fig. 1.

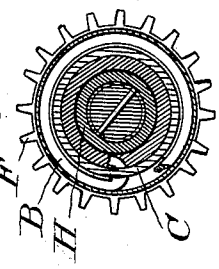


Fig. 2.

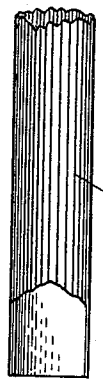


Fig. 3.

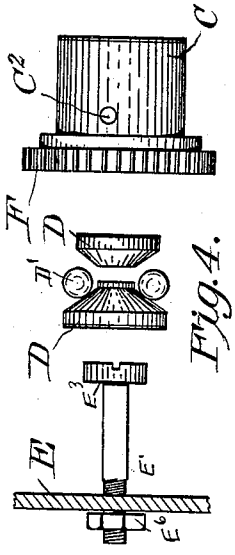


Fig. 4.

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4 SHEETS—SHEET 2.

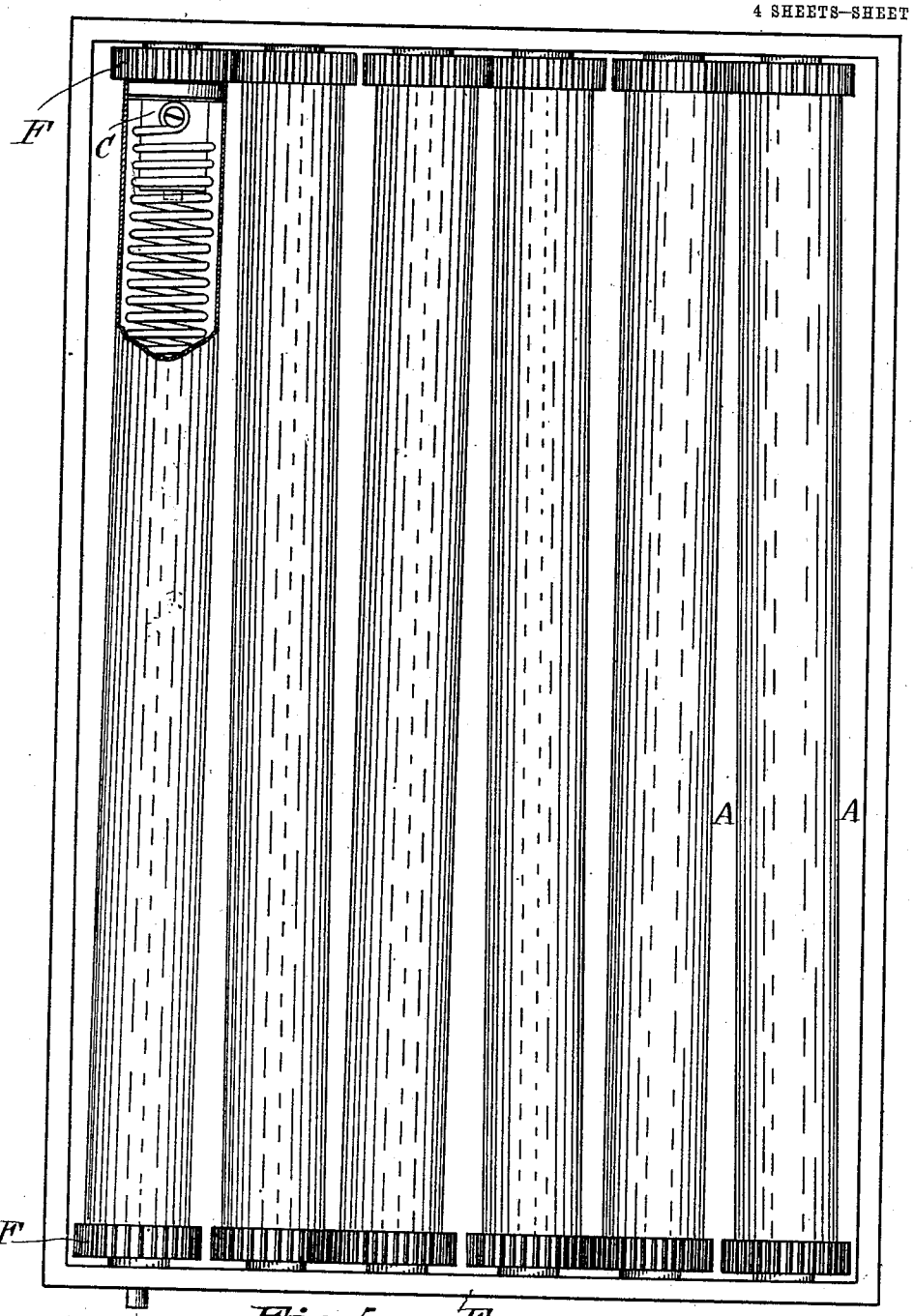


Fig. 5.

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4 SHEETS—SHEET 3.

Fig. 6.

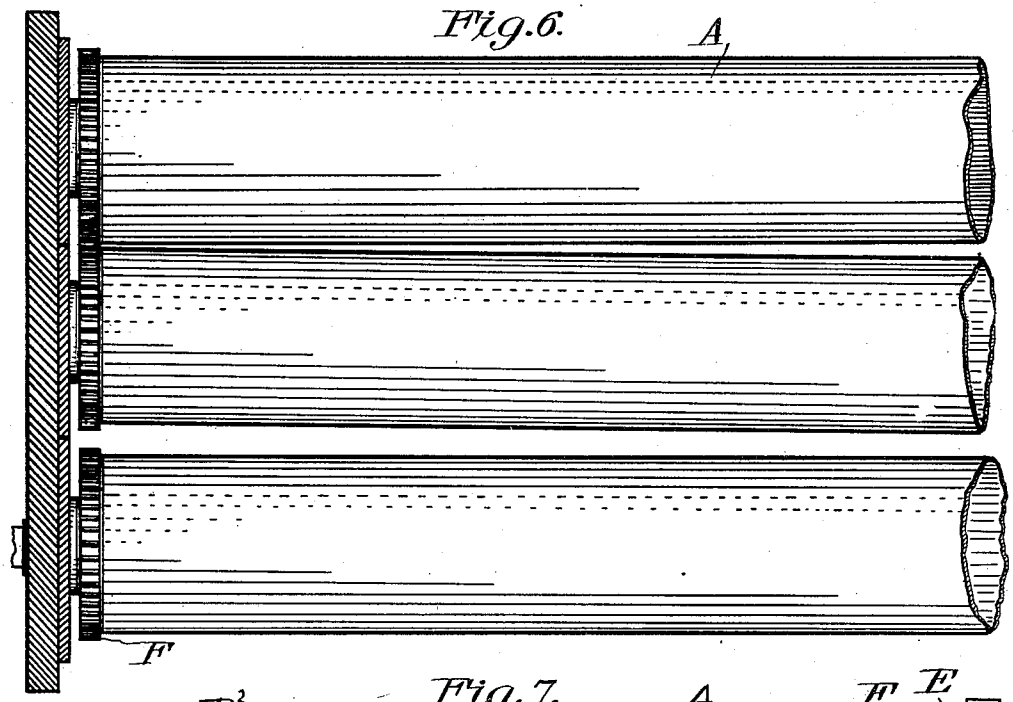
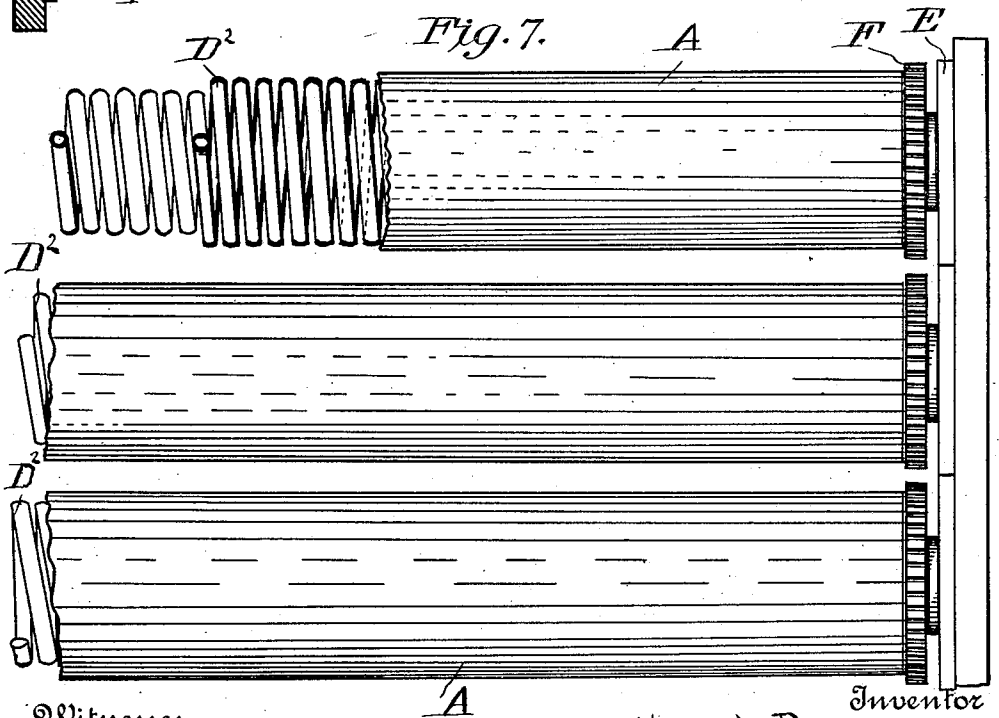


Fig. 7.



Witnesses

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SPRING MOTOR.

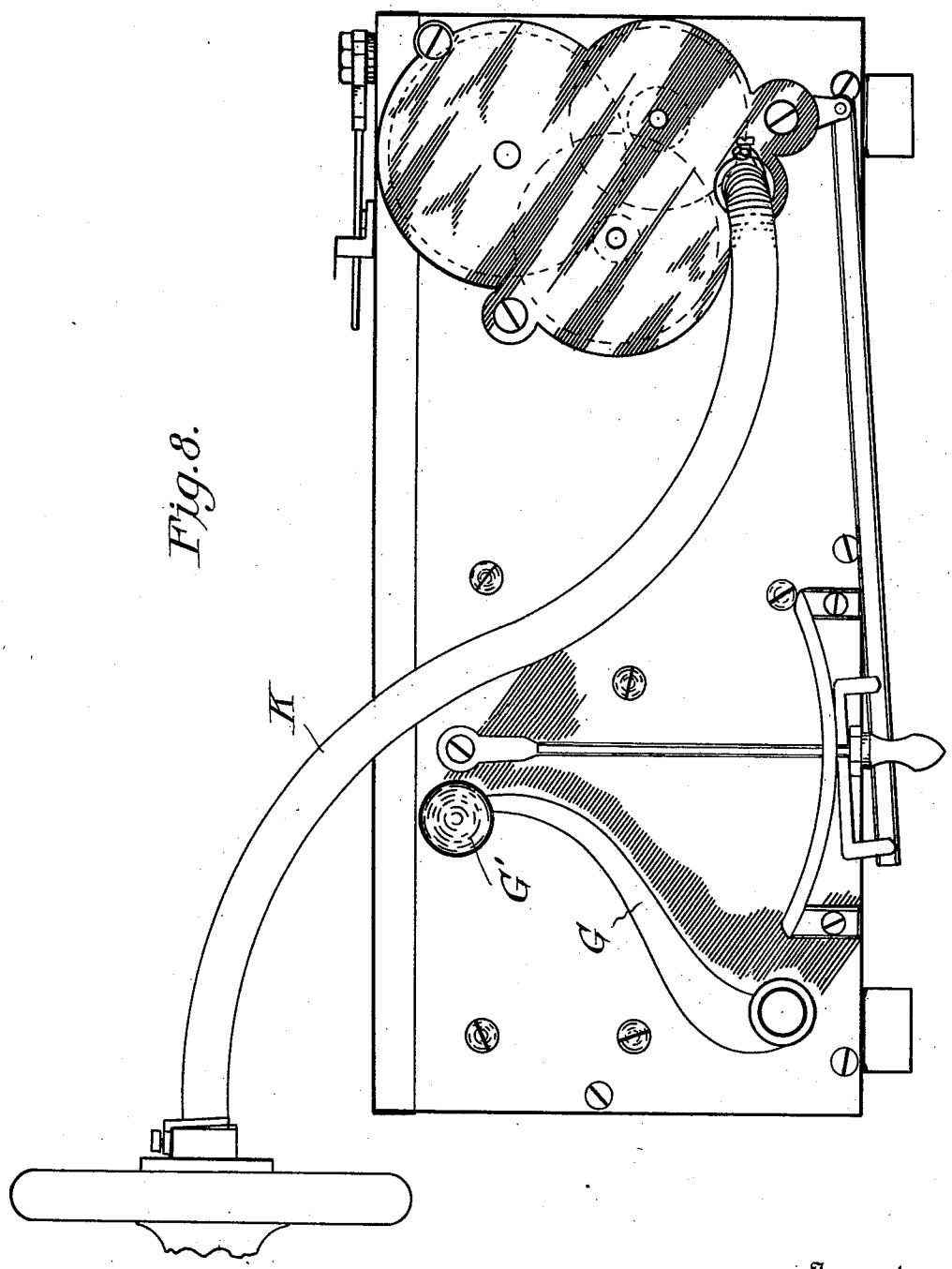
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4 SHEETS—SHEET 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY L. PITMAN, OF PINEVILLE, KENTUCKY.

SPRING-MOTOR.

1,076,314. Specification of Letters Patent. Patented Oct. 21, 1913.

Application filed March 4, 1912. Serial No. 681,351.

To all whom it may concern:

Be it known that I, HENRY L. PITMAN, a citizen of the United States, residing at Pineville, in the county of Bell and State of Kentucky, have invented certain new and useful Improvements in Spring-Motors; and I do hereby 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 and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in motors and it relates more particularly to that class of motors in which spiral springs arranged in series are employed, the object of the invention being to produce a simple, practical and efficient motor of this type in which any desired number of springs may be employed arranged either in a single series, horizontally or vertically disposed, or in two or more series, the springs being inclosed within protecting casings or shells and being adapted to be wound simultaneously, the invention being designed primarily for use in supplying power for actuating fans, sewing machines or other light machinery, although it will at once be noted that this construction may be equally well adapted for supplying greater amount of power by the employment of heavier or more powerful springs.

To these ends and to such others as the same may pertain, the invention consists in the peculiar construction, combination and adaptation of parts, all as will be more fully described, shown in the accompanying drawings and then specifically defined in the appended claims.

The invention is illustrated in the accompanying drawings which, with the letters of reference marked thereon, form a part of this specification and in which:—

Figure 1 is a top plan view of a spring motor constructed in accordance with my invention, parts being broken away. Fig. 2 is a plan view of the inner end of one of the spring protecting shells showing the inclosed spring receiving member or socket to which the spring is attached. Fig. 3 is a detail view of the core and its receiving member or socket, the same being shown as detached. Fig. 4 is a detail view of one of the bearings and bolt carrying gear wheels forming a bearing for the core, the parts being detached but shown in their relative positions. Fig. 5 is a top plan view of a bank or series of shells with their inclosed springs, the same being shown as arranged in a horizontal series, a portion of one of the shells being broken away to disclose the contained spring. Fig. 6 is a side elevation of a bank or series of shells with their contained springs, the same being shown as arranged in vertical series. Fig. 7 is a like view showing the opposite ends of the series of shells, parts being broken away to show the spring inclosed within one of the shells, and Fig. 8 is a front elevation showing the application of the motor to a sewing machine.

Reference now being had to the details of the drawings by letter, E designates a frame in which a driving shaft B is journaled in suitable bearings and having a crank G fixed thereto upon which a handle G′ is mounted. A ratchet wheel B^2 is keyed to said shaft adjacent to the end opposite to which the crank is fastened and a pawl B^3 is mounted upon a pin B^4 upon the frame and is adapted to engage the teeth of the ratchet wheel. Bolts E′ are passed through one side of said frame E and have nuts E^6 mounted upon the threaded ends thereof and E^3 designate heads to said bolts. Conical-shaped bearing members D are journaled upon said bolts, and ball bearings D′ are supported by said bearing members. Gear wheels, designated by letters F, F′ and F^2, have internal race ways resting upon the ball bearings. Said gear wheels each has a collar C projecting therefrom, either integral with or fixed to said gear wheel. A coiled spring D^2 is mounted about the driving shaft B and is fastened at one end to an aperture C^2 in a collar C upon a gear wheel F and its other end is fastened to the collar not shown and which projects from the ratchet wheel B^2.

It will be noted that the gear wheels F and F′ intermesh with each other at one side of the frame, while a similar gear wheel F^2 at the opposite side of the frame is in mesh

with a gear wheel F^3, affording means whereby rotary movements may be imparted from one gear wheel to another in a series. In order to accomplish this, it will be observed upon reference to Fig. 1 of the drawings that the springs are arranged in oblique relationship.

Upon reference to Fig. 1 of the drawings will be seen a core H, which may be either solid or hollow, the ends of which are adapted to enter the collar C in which it is supported. Said core serves to prevent lateral displacement of the spring, because of the excessive weight of the heavy spring, thus preventing any unnecessary weight being thrown upon the wheels. In order to secure the best possible results in the use of a series of springs and to compensate for the loss of power by the friction of parts, I provide a plurality of coiled springs mounted one within the other, the ends of said springs connecting sleeves at the opposite sides of the frames. The employment of two or more springs rather than one heavy spring is more efficient for the reason that the lighter springs, while furnishing the same amount of power, are far more flexible than the heavier springs of the same diameter.

In Fig. 8 of the drawings, I have shown the application of my spring motor to a sewing machine through the medium of a flexible shaft K.

In operation, it will be noted that the turning of the crank arm G will result in the simultaneous winding of all of the springs in the series, this being effected by a transmission of power through the means of the gear wheels from the spring contained within the first shell in the series to that contained in the next adjacent shell and through the meshing of the opposing gears at corresponding ends of the shells, and from the second to the third by the meshing of the gears at the opposite end of the second shell to the adjacent gear upon the third shell and thus continuously to each succeeding spring by the meshing of the gears at the alternate opposite ends of the springs, as will be readily understood.

Any suitable form of governor mechanism adapted to the purpose may be employed to regulate the speed of the motor.

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

1. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame, each wheel having a collar projecting from the face thereof, cores supported within said collars, a spring about each of said cores and fastened to the collars of the wheels, and means for imparting rotary movement to the gear wheels, as set forth.

2. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame, each wheel having a collar projecting from the face thereof, cores supported within said collars, a spring about each of said cores and fastened to the collars of the wheels, a driving shaft journaled in the frame, a ratchet wheel fixed to said shaft, a pawl engaging the ratchet wheel, a gear wheel loosely mounted upon the driving shaft and adapted to drive said intermeshing gear wheels, a core about said shaft, and a coiled spring fastened at one end to the gear wheel upon said driving shaft and its other end secured to said ratchet wheel, as set forth.

3. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame and having collars, cores engaging said collars and supported therein, a spring about each of said cores and fastened to said collars, and means for imparting rotary movement to the gear wheels, as set forth.

4. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame and having each a collar projecting from the face thereof, cores engaging said collars and supported therein, a spring about each of said cores and fastened to said collars, a driving shaft journaled in the frame, a ratchet wheel fixed to said shaft, a pawl engaging the ratchet wheel, a gear wheel loosely mounted upon the driving shaft and adapted to drive said intermeshing gear wheels, and a coiled spring fastened at one end to the gear wheel upon said driving shaft and its other end secured to said ratchet wheel, as set forth.

5. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately and upon opposite sides of the frame and having each a collar projecting from one of its faces, cores engaging said collars and supported therein, a spring about each of said cores and fastened to said collars, a driving shaft journaled in the frame, a ratchet wheel fixed to said shaft, a pawl engaging said ratchet wheel, a gear wheel loosely mounted upon the driving shaft and adapted to drive said intermeshing gear wheels, and a coiled spring fastened at its ends to the wheels upon the driving shaft, as set forth.

6. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame, each wheel having a collar projecting from the face thereof, cores supported within said collars, a spring about each of said cores and fastened to the collars of the wheels, means for imparting

rotary movement to the gear wheels, and a protecting shell about each spring and supported loosely upon said collars, as set forth.

7. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame and having each a collar upon one face thereof, cores engaging said collars and supported in said collars, a spring about each of said cores and fastened to said collars, means for imparting rotary movement to the gear wheels, and a protecting shell about each spring and loosely mounted about the collars, as set forth.

8. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame and having each a collar projecting from a face thereof, the walls of which collars are apertured, cores engaging said collars supported within the latter, a spring about each of said cores, the ends of each spring being fastened in apertures in the walls of said collars, as set forth.

9. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame and having each a collar upon the face thereof, the walls of which are apertured, each wheel provided with a shoulder about each collar, cores engaging said collars and supported therein, a spring about each of said cores, the ends of each spring being fastened in apertures in the walls of said collars, as set forth.

10. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame, each gear wheel having a laterally extending collar, a core engaging said collars, a bearing member mounted within each collar and supporting said cores, a spring about each of said cores and fastened to said collars, and means for imparting rotary movement to the gear wheels, as set forth.

11. A spring motor comprising a frame, gear wheels mounted thereon and arranged in intermeshing pairs alternately upon opposite sides of the frame, each gear wheel having a laterally extending collar, a core engaging said collars, a bearing member mounted within each collar and supporting said cores, a stub shaft secured to the frame and to which said bearing is journaled, a spring about each of said cores and fastened to said wheels, and means for imparting rotary movement to the gear wheels, as set forth.

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

HENRY L. PITMAN.

Witnesses:
WM. LOW,
C. M. PERKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."