No. 651,021. Patented June 5, 1900.

F. N. SILVEY.

SPRING MOTOR.

(Application filed Sept. 18, 1899.)

(No Model.)

Fig. 1.

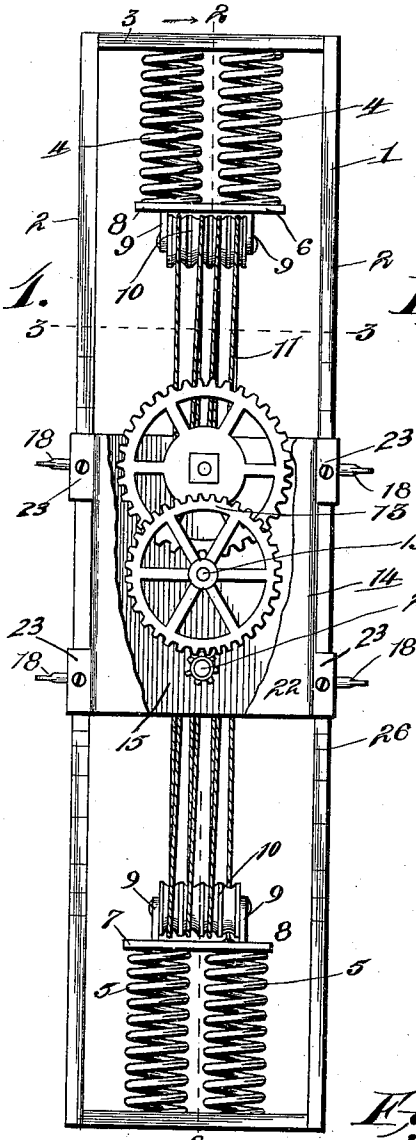


Fig. 2.

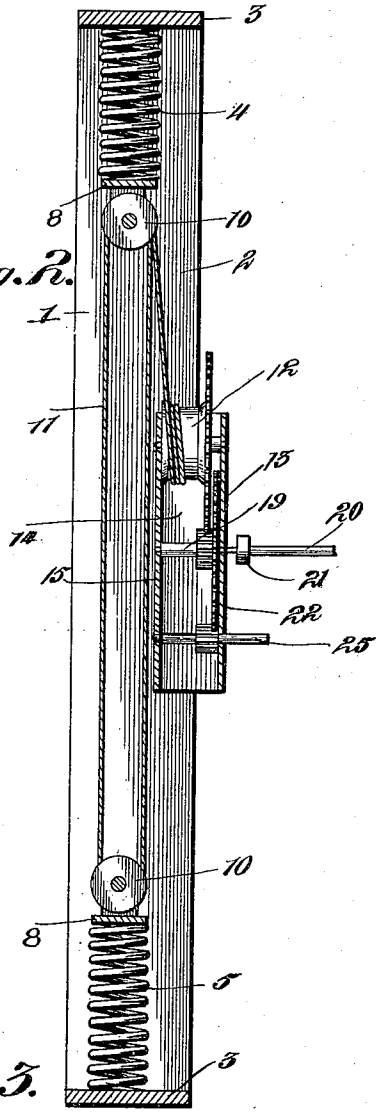
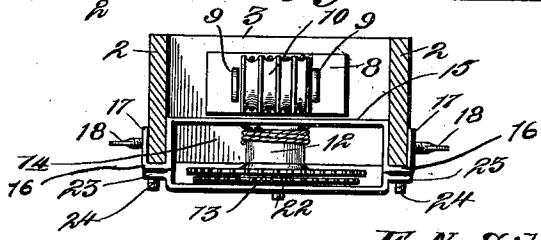


Fig. 3.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FAINES N. SILVEY, OF CROSSVILLE, ALABAMA.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 651,021, dated June 5, 1900.

Application filed September 18, 1899. Serial No. 730,919. (No model.)

To all whom it may concern:

Be it known that I, FAINES N. SILVEY, a citizen of the United States, residing at Crossville, in the county of De Kalb and State of Alabama, have invented a new and useful Spring-Motor, of which the following is a specification.

This invention relates to spring-motors, and has for one object the production of a simple, durable, and inexpensive motor of this type provided with an adjustable gear-carriage, by means of which the power-shaft may be readily centered with and coupled to the driving-shaft of any driven apparatus deriving its power from my motor.

A further object of the invention is to extend the duration of operation to the maximum by the interposition of cable-gearing between oppositely-acting springs and a member of the gearing mounted upon the adjustable carriage.

Referring to the drawings, Figure 1 is an elevation of my motor, showing the face-plate of the gear-carriage broken away. Fig. 2 is a central vertical section on the line 2 2 of Fig. 1, certain of the parts being shown in elevation; and Fig. 3 is a sectional view on the line 3 3 of Fig. 1.

Referring to the numerals of reference on the accompanying drawings, in which corresponding parts are designated by like numerals throughout the several views, 1 indicates the frame of my motor, preferably of oblong shape and comprising side and end rails 2 and 3.

4 and 5 indicate the motor-springs, preferably of spiral form and arranged in multiple at the opposite ends of the casing 1, to which their extremities are secured. The contiguous extremities of the springs 4 and 5—that is to say, the ends of the several springs at each end of the motor—are connected by pulley-frames 6 and 7, comprising base-plates 8 and parallel projecting ears 9. Between the ears 9 of each pulley-frame is mounted a multiple-grooved pulley 10. These pulleys are connected by a cable 11, secured at one end to one of the pulley-frames, passed alternately around the pulleys progressively from end to end, and finally secured at its opposite extremity to a drum 12 or other rotary element designed for the transmission of power from the spring-motor to a train of gearing 13, mounted upon an adjustable or sliding gear-carriage 14. This carriage may be of any desired form, but preferably comprises a bottom plate 15, dropped between the side rails and supported thereon by flanges 16, bent over the side rails, and turned down upon the opposite side thereof to form side flanges 17 for the reception of adjustment-screws 18, by means of which the drum and gearing carried by the gear-frame may be adjusted along the motor-frame to bring one of the shafts of the gearing constituting a power-shaft 19 into accurate alinement with the driving-shaft 20 of the mechanism to be driven, to which it may be coupled by a coupling 21. This adjustment of the gear-carriage is permitted by reason of the adjustable drive connections between the drum 12 and the respective springs and formed by the cable 11, one end of which is wrapped upon the drum, so as to take up or let out the cable while the carriage is being adjusted. In addition to the base-plate 15 the gear-carriage comprises a face-plate 22, in which the several shafts of the gearing are journaled, and which is provided with angular flanges 23, resting upon the flanges 16 and detachably secured thereto by set-screws 24.

In operation, the gear-carriage having been properly adjusted to effect the connection of the motor and the key-shaft 25 having been rotated to wind the cable 11 upon the drum 12, thereby causing the pulleys 10 to be drawn toward each other and the power-springs to be expanded, the motor-springs will exert powerful pressures in opposite directions, tending to separate the pulleys. As the distance between the pulleys increases the extent of cable wound upon and between them is increased, and this increase must of course be provided for by the unwinding of the cable from the drum. The amount of cable required to accommodate the lengthening of the several strands causes an actuation of the drum as much in excess of that necessary to compensate for the increase in one loop as there are loops or strands between the motor-springs. Thus slight movement of the springs serves for an extended actuation of the drum, and in this manner is accomplished the production of a device of this

character having a maximum duration of operation without rewinding.

The edges of the side rails 2 are preferably provided with graduations 26, by means of which the gear-carriage may be adjusted to any given height to aline with a driving-shaft of known position without the necessity for the random adjustment of the carriage and the determination of its accuracy by trial.

What I claim is—

1. In a spring-motor, a supporting-frame, motor-springs carried thereby, a normally-fixed and adjustably-movable gear-carriage, a power-shaft mounted upon the carriage and movable therewith, and adjustable drive connections between the springs and the power-shaft.

2. In a spring-motor, a supporting-frame, motor-springs carried thereby, pulleys connected to and movable with the respective springs, a normally-fixed and adjustably-movable gear-carriage, a drum, and a power-shaft, both of the latter being mounted upon and movable with the gear-carriage, gears connecting the drum with the shaft, and adjustable flexible connections wound upon the drum and passing through the pulleys.

3. In a spring-motor, the combination with a frame comprising end and side rails, of an adjustable gear-carriage comprising a base-plate having flanges extended over the edges of the side rails, a face-plate provided with flanges, and set-screws for securing the adjustment of the first-named flanges, a drum and gearing within the gear-carriage, a plurality of motor-springs, arranged in series at the opposite ends of the casing, pulley-plates connecting the several springs at each end of the motor, multiple-grooved pulleys mounted in the pulley-frames, a cable terminally secured to one of the frames and passed alternately around the pulleys and secured at its opposite extremity to the drum.

4. In a spring-motor, the combination with a supporting-frame, of oppositely-disposed motor-springs carried thereby, a normally-fixed and adjustably-movable gear-carriage, located between the springs, and having opposite flanges slidably embracing opposite sides of the frame, set-screws carried by the flanges and adjustably binding upon the frame, a power-shaft mounted upon and movable with the carriage, and an adjustable drive connection between the springs and the power-shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FAINES N. SILVEY.

Witnesses:

D. H. JOHNSON,

C. B. MCMAHAN.