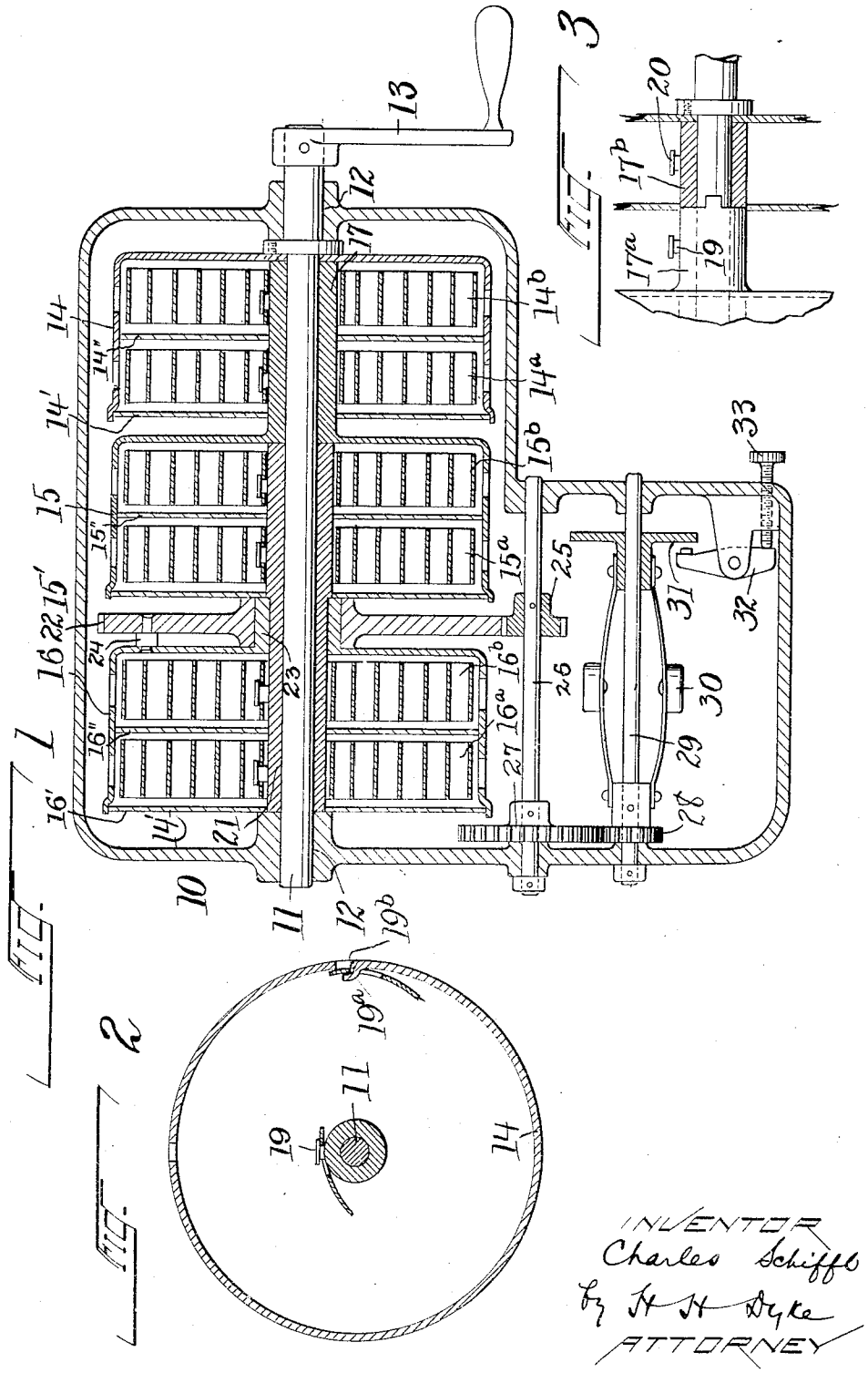
C. SCHIFFL.

SPRING MOTOR.

APPLICATION FILED OCT. 24, 1917.

1,328,402. Patented Jan. 20, 1920.



UNITED STATES PATENT OFFICE.

CHARLES SCHIFFL, OF MONTCLAIR, NEW JERSEY.

SPRING-MOTOR.

1,328,402. Specification of Letters Patent. Patented Jan. 20, 1920.

Original application filed February 28, 1917, Serial No. 151,420. Divided and this application filed October 24, 1917. Serial No. 198,198.

To all whom it may concern:

Be it known that I, CHARLES SCHIFFL, a citizen of the United States, and a resident of Montclair, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Spring-Motors, of which the following is a specification.

My invention relates to spring motors which are adapted more particularly for use in phonographs.

This application is a revision of my former application Serial No. 151,420, filed Feb. 28, 1917, for phonograph motor.

An object of the invention consists in the provision of means whereby the breakage of a spring will not result in putting the spring motor out of operation, it being possible, notwithstanding the breakage of a spring, or, in some cases, of two or more springs, to continue the use of the motor with, of course, some reduction in the length of time for which it will operate on each winding.

Another object of the invention consists in the provision of novel means for the detection of a broken spring, facilitating repair occasioned by spring breakage.

My invention further relates to the improvement of spring motors in a number of important respects, and with the foregoing and related objects in view, my invention consists in the construction, parts, improvements and combinations herein set forth and claimed.

In the accompanying drawing forming a part of this specification I have illustrated certain embodiments of my invention for the purpose of affording a clear understanding thereof, but it is to be understood that the invention is not limited to the specific form or forms shown, except as is required by my claims by which my invention is defined.

In said drawing, Figure 1 is a longitudinal sectional view of one form of spring motor embodying my invention mounted in a casing which may contain an oil bath. Fig. 2 is a sectional detail view showing the preferred spring fastening means, and Fig. 3 is a fragmentary detail view of a modification.

In the ordinary form of spring motor for phonographs, in which the drive is through a set of springs arranged in series, one exerting its driving action through another in the series until the driving gear is reached, the breaking of a single spring puts the motor entirely out of commission until the broken spring has been replaced. In accordance with the present invention the springs are arranged both in series and in parallel, and in order to break the driving connection it is necessary that all the parallel arranged springs in a single group or set be broken. If one of said springs or any number less than the entire number of springs in a single set or group should happen to break, it becomes possible, by the present invention, to continue the operation of the machine with only, of course, the result that the phonograph will not play quite so long upon a single winding.

The series-parallel arrangement of the springs may be carried out in any desired way, but I prefer to make use of narrow springs and comparatively wide spring barrels and to place a series of such narrow springs in each barrel. In the form shown there is a single partition wall in each spring barrel and two springs, one on each side thereof, but the number of springs arranged in parallel as in a single barrel may be more than two if desired.

While a single driving sleeve for each barrel may be used to advantage, I may provide separate sleeves for each spring, such separate sleeves facilitating replacement of broken springs and also making it possible to compensate for any slight differences in length or tension which may exist in the separate springs put together in a parallel set or group.

10 designates a casing which may contain an oil bath into which the spring barrels and springs may dip for purposes of lubrication.

The shaft 11 is mounted in such casing or other suitable support in any suitable manner, as, for example, in journals 12. Means for turning the shaft to wind up the springs and holding them in wound up position are provided. In the form shown a handle 13 is provided on the shaft, and the usual ratchet or equivalent means (not shown) may be utilized for holding the shaft after the springs are wound up.

A series of spring barrels are provided, so arranged that they act through one another in a series in the usual manner which has been customary with separate springs in phonograph motors. The number of spring barrels or groups of springs may, of course, be varied.

In the drawing three spring barrels are shown and are designated by reference numerals 14, 15 and 16. Each barrel, in the form shown, has its cover 14′, 15′ and 16′, and each has also partitions 14″, 15″ and 16″, but these may be dispensed with if desired.

In the form shown the shaft 11 is secured to the barrel 14. This is accomplished, in the construction illustrated, by securing the barrel 14 to a collar 17 on the shaft 11.

A plurality, group or set of spiral springs are attached to the barrel 14 and to a sleeve turning on the shaft 11. In the drawing two springs 14^a and 14^b are shown. The means of attachment may be of various forms. For example, the springs may be slotted at their ends and at their inner ends the slotted parts may take over slotted studs or pins 18 on the sleeve 17, while at their outer ends the slotted parts of the springs may receive hooks 19^a which may be formed by being struck up from the material of the spring barrel and may have a stiffening rib 19^b which also serves to center the spring with respect to the hook 19^a.

The sleeve 17 (as also the other sleeves for the other barrels) may be made in parts 17^a and 17^b, one part for each spring, as shown in Fig. 3, and these parts may be clutched together by readily assembled clutch means such as studs 19 on the sleeve 17^a and studs 20 on the sleeve 17^b. This arrangement is a convenience in assembly and repair and serves as a means for compensating for slight differences of tension and of length in the separate springs of a parallel set or group.

The sleeve 17 is secured to the next adjacent spring barrel in the series, as the barrel 15, and there is arranged in the spring barrel 15 a set or group of parallel arranged springs 15^a and 15^b, similar in size and number to the springs in the barrel 14 and preferably secured to the barrel 15 and to the sleeve 21, also turning on the shaft 17, in the same manner as already described with respect to the springs in the barrel 14.

The sleeve 21 passes into the interior of the spring barrel 16 and a set of springs therein, as the springs 16^a and 16^b, are secured respectively to said sleeve 21 and to the spring barrel 16, but in this case the arrangement of the springs is preferably reversed. The sleeve 21 is not secured to the barrel 16 but serves to drive the barrel 16 through the springs 16^a and 16^b which are preferably wound up in the opposite direction from the springs in the lower sets in the series. The last spring barrel in the set, here the barrel 16, serves to impart rotation to a portion of the motor, and in the form shown a gear wheel 22 is mounted upon an extension 23 of the barrel 16 and secured to said barrel 16, as by fastening means 24, to rotate therewith. The other parts of the motor may be driven in any suitable way from the gear 22. In the form shown a pinion 25 is driven thereby and serves to rotate a shaft 26 carrying a gear 27 which rotates the pinion 28 on the governor shaft 29. The governor may have arms 30 and a disk 31 and may be controlled by any convenient controlling means, as the lever 32 having an adjusting screw 33. Other parts of the motor may be of any ordinary construction and need not be illustrated to afford an understanding of my invention.

The spring barrels are preferably provided with holes opposite the springs therein. These serve to permit oil to flow readily to the interior of the barrels in the casing and also serve as a convenient means of inspection, for if a spring or springs in a parallel arranged set or group be broken, such broken spring or springs may be readily detected through the openings in the barrels and no time is lost in failing to locate the proper spring when a repair is to be made.

The operation of a spring motor in accordance with my invention will be readily understood from the foregoing. When the motor is wound all the springs in a single set or group act together in parallel, and the several groups, preferably each arranged in a single barrel, operate in a series. If one or more of the springs in a single set is broken, so long as not all the springs in such set are broken, the motor is not put out of operation but may continue to be used until a convenient time for repair, the only difference being that it will not play quite so many records or for so long a time as before. Where the separate sleeves for the individual springs are provided, as shown in Fig. 3, repairs may be effected with somewhat greater readiness, and by turning the separate sleeves somewhat with respect to one another in putting the parts together, it becomes possible to compensate for slight differences in length or tension of the spring.

It is to be understood that the embodiments of my invention shown and described are intended for the purpose of affording a clear understanding thereof only, and that I am not to be limited to such specific form or forms, except as is required by my claims by which the scope of my invention is defined, and that numerous changes in and departures from the precise construction

shown may be resorted to without departing from my invention or sacrificing any of its advantages.

I claim:

1. In a spring motor, a plurality of sets of parallel acting springs arranged so that the sets of parallel springs are arranged to act in series.

2. In a spring motor, a plurality of sets of power springs, the springs in each set being arranged to operate in parallel, and the sets arranged to operate in series.

3. In a spring motor, a plurality of spring barrels each containing a plurality of power springs, the springs in each barrel being arranged in parallel therein, and the barrels arranged in series.

4. In a spring motor, a series of spring barrels, a pair of power springs in each barrel, the power springs in each barrel being arranged in parallel therein, and the barrels being arranged to operate in series.

5. In a spring motor, a plurality of spring barrels, a pair of power springs in each barrel, a partition between the springs in the pair, the springs in each barrel being arranged to act in parallel, and the barrels being arranged to act one upon another in series.

6. In a spring motor, a plurality of spring barrels, a shaft extending therethrough, a sleeve within one of said barrels and upon said shaft, said sleeve being connected to the adjacent barrel, a plurality of springs in the first named barrel and arranged in parallel between said barrel and said sleeve, a sleeve in the second named barrel, a plurality of springs arranged in parallel between said barrel and said sleeve, and means actuated from the last named sleeve for driving the motor.

7. In a spring motor, a series of spring barrels, each containing a plurality of springs arranged in parallel therein, a shaft extending through said barrels, and sleeves on said shaft and connected to adjacent barrels in the series whereby the springs within any one barrel act in parallel and the barrels operate successively in series to impart driving action from the springs to a driven element.

8. In a phonograph motor, a spring barrel of sheet metal, a spring in said barrel, and means of attachment between said spring and said barrel comprising a tongue struck inwardly from the sheet metal of the barrel, said tongue having a strengthening and alining rib.

9. In a phonograph motor, a spring barrel, a plurality of springs in the barrel and having an end secured thereto, a shaft, a plurality of sleeves on the shaft, the springs being secured at the opposite ends thereof to said sleeves, there being one such sleeve for each spring, and said sleeves being capable of being locked together in adjusted relative position so that the springs in a single barrel may be given a uniform tension.

In testimony that I claim the foregoing, I have hereto set my hand, this 22nd day of October, 1917.

CHARLES SCHIFFL.