May 27, 1924. 1,495,348

D. E. ODOM

SPRING MOTOR

Filed Dec. 6, 1922

Fig. 1.

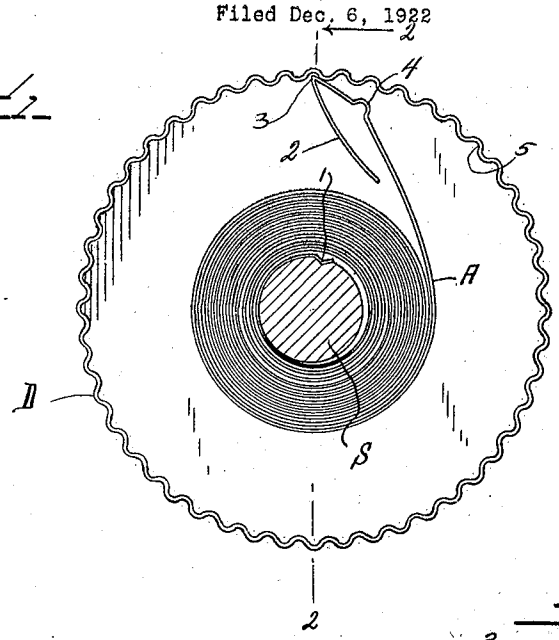


Fig. 2.

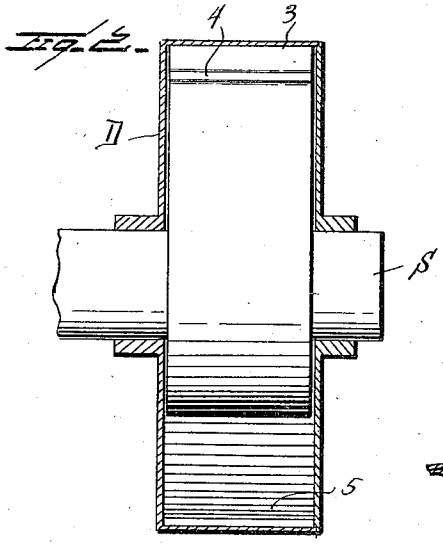


Fig. 3.

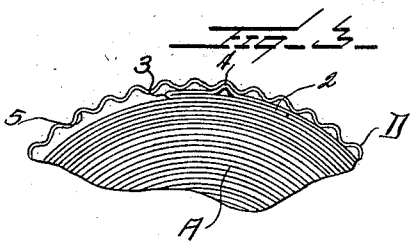


Fig. 4.

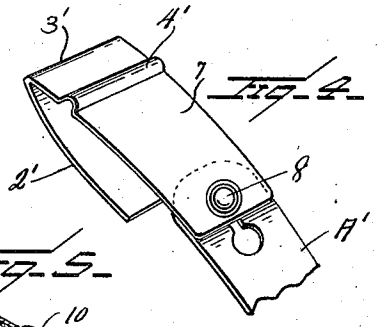


Fig. 5.

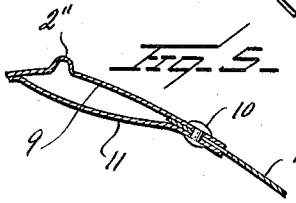
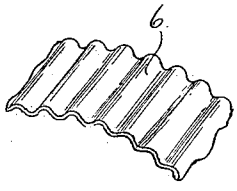


Fig. 6.



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Patented May 27, 1924. 1,495,348

UNITED STATES PATENT OFFICE.

DANIEL E. ODOM, OF BENNETTSVILLE, SOUTH CAROLINA.

SPRING MOTOR.

Application filed December 6, 1922. Serial No. 605,299.

To all whom it may concern:

Be it known that I, DANIEL E. ODOM, a citizen of the United States, residing at Bennettsville, in the county of Marlboro and State of South Carolina, have invented certain new and useful Improvements in Spring Motors, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in spring motors and it is an object of the invention to provide a novel and improved device of this general character wherein over-winding of the spring is prevented.

Another object of the invention is to provide a novel and improved motor of this general character embodying a spring and a driven member associated therewith and wherein the tension of the spring normally maintains the same in driving connection with the driven member and which connection between the spring and driven member becomes inoperative when the tension of the spring has reached a predetermined degree such as when the spring has been substantially completely wound.

Furthermore it is an object of the invention to provide a novel and improved motor of this general character wherein the outer extremity of the spring is maintained in operative engagement with a driven member under the tension of the spring and in a manner whereby the connection between the spring and driven member becomes inoperative when the tension of the spring reaches a predetermined degree.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved spring motor whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:—

Figure 1 is a sectional view taken through a motor constructed in accordance with an embodiment of my invention showing a spring completely wound;

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1;

Figure 3 is a fragmentary sectional view taken in a direction circumferentially of Figure 1 showing the spring in locked engagement with the drum;

Figure 4 is a view in perspective illustrating a further embodiment of my invention;

Figure 5 is a sectional view illustrating a still further embodiment of my invention; and

Figure 6 is a fragmentary view in perspective of a supplemental wall to be inserted within the drum or the like.

As disclosed in the accompanying drawings, D denotes a drum of requisite dimensions and which is mounted upon the shaft S, said drum D or shaft S having relative rotation under the instrumentality of the spring A. The spring A is of the conventional spiral type and has its inner end portion suitably fixed as at 1 to the shaft S.

The outer end portion of the spring A is returned to provide an inwardly directed spring arm 2, said arm being preferably arcuate in a direction lengthwise thereof with the outbow of said arm 2 disposed in a general direction toward the shaft S.

The spring A at a predetermined distance inwardly of the bend 3 is provided with a rib or bead 4 disposed in a direction toward the peripheral wall of the drum D.

As is particularly illustrated in Figures 1 and 3 the peripheral wall of the drum D is corrugated to provide the inner face of said wall with an angular series of channels or grooves 5, in one of which the rib or bead 4 is adapted to seat in a manner and for a purpose to be hereinafter more particularly described and which is illustrated in Figure 3 of the drawings.

In practice as the spring A is wound upon suitable rotation of the shaft S and as the convolutions of the springs tighten around the shaft S, and when the spring A reaches a tension of predetermined degree or is substantially completely wound, the rib or bead 4 will move free of the grooves or channels 5, as is particularly illustrated in Figure 1 so that the continued rotation of the shaft S will be free of the drum D and as the spring travels over the inner face of the peripheral wall of the

drum D a sound will be produced to give an audible signal that the spring A has been sufficiently wound.

When the motor is caused to operate as the outer convolution of the spring loosens the same will contact with the arm 2 which in connection with the tension of said outer convolution will flex the outer extremity of the spring A sufficient to cause the bead or rib 4 to seat within a groove or channel 5 and under which condition the desired relative rotation of the drum D and shaft S is effected by the tension of the spring A. This operative or working engagement of the spring A with the drum D is clearly illustrated in Figure 3 and in which figure the spring S is substantially completely unwound.

While in Figures 1 and 2 I show the peripheral wall of the drum D corrugated to provide the requisite grooves or channels 5 it is to be understood that a separate corrugated plate 6, as is illustrated in Figure 6 may be properly fitted within the drum D. It is also to be understood that the grooves or channels 5 need not necessarily be produced by corrugations as any means may be employed to provide the desired irregular inner surface to the drum D. It is to be understood that this locking engagement of the spring A with the drum D is maintained until the spring A is again overwound.

If it should occur that as the spring A is overwound the rib or bead 4 does not promptly pass out of the associated groove or channel 5, the portion of the spring A outwardly of or in advance of the rib or bead 4 will serve as a lever to assure the desired disengagement and during which action the bend 3 serves as a fulcrum.

The embodiment of my invention as illustrated in Figures 1, 2 and 3 is adapted to be an initial production but I find it of advantage to provide means whereby the embodiment of my invention may be employed in connection with spring motors of the type now generally in use. As disclosed in Figure 4 of the accompanying drawings, I disclose an attachment wherein a spring extension 7 is employed and which is adapted to be attached as at 8 to the outer extremity of the spring A′ in any manner which may fully comply with the requirements of practice. This spring extension 7 when applied is substantially in continuation of the spring A′ proper. The spring extension 7 is also provided with a returned portion 2′ provided in an arm similar to the arm 2 hereinbefore described and said spring extension 7 inwardly of the bend 3′ is provided transversely thereof with a bead or rib 4′. This spring extension 7 is adapted to coact with the drum D in the same manner as hereinbefore described with respect to the invention as comprised in Figures 1 to 3.

In the embodiment of my invention as illustrated in Figure 5 the spring extension 9 is suitably anchored to the spring A″ as at 10 and said extension 9 inwardly of its outer end is provided with the outstanding rib or bead 2″. The connection 10 also secures to the outer portion of the spring A″ an arcuate spring arm 11 underlying the extension 9 with the outer extremities of the extension 9 and the spring 11 constantly in contact. The spring 11 is also longitudinally arcuate with its outbow inwardly directed. The arm 11 functions in substantially the same manner as either the arm 2 or 2′ while the extension 9 together with the bead or rib 2 operates in the same manner and for the same purpose as the spring extension 7 as disclosed in Figure 4 or the outer extremity of the spring A as comprised in the first embodiment of my invention.

From the foregoing description it is thought to be obvious that a spring motor constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

1. In combination with two members supported for relative rotation, a spiral spring having its inner portion engaged with one of said members, the outer end portions of said spring and the second member being provided with interlocking members normally held in engagement by tension of the spring, and an arm positioned between the outer portion of the spring and the outer convolution thereof and with which said portion contacts as the spring unwinds to facilitate the engagement of said spring with the second member.

2. In combination with two members supported for relative rotation, a spiral spring having its inner portion engaged with one of said members, the outer end portions of said spring and the second member being provided with interlocking members normally held in engagement by tension of the spring, and an arm positioned between the outer portion of the spring and the outer convolution thereof and with which said portion contacts as the spring unwinds to facilitate the engagement of said spring with the second member, said arm being resilient.

3. In combination with two members supported for relative rotation, a spiral spring

having its inner portion engaged with one of said members, the outer end portions of said spring and the second member being provided with interlocking members normally held in engagement by tension of the spring, and an arm positioned between the outer portion of the spring and the outer convolution thereof and with which said portion contacts as the spring unwinds to facilitate the engagement of said spring with the second member, said arm being arcuate with the outbow disposed toward the outer convolution of the spring.

4. In combination with two members supported for relative rotation, one of said members being substantially concentric to the other and having a grooved peripheral wall, a spiral spring having its inner end portion engaged with the second member, the outer end portion of said spring being provided with a transversely disposed rib to seat within a groove of the first named member, said rib being normally held within the groove under tension of the spring, said rib being positioned inwardly of the outer end of the spring.

5. In combination with two members supported for relative rotation, one of said members being substantially concentric to the other and having a grooved peripheral wall, a spiral spring having its inner end portion engaged with the second member, the outer end portion of said spring being provided with a transversely disposed rib to seat within a groove of the first named member, said rib being normally held within the groove under tension of the spring, said rib being positioned inwardly of the outer end of the spring, and an arm carried by the outer end portion of the spring and interposed between said outer end portion and the outer convolution of the spring, said arm being normally spaced from the outer portions of the spring.

In testimony whereof I hereunto affix my signature.

DANIEL E. ODOM.