July 10, 1928.

1,677,045

D. E. ODOM

SPRING MOTOR

Filed Jan. 25, 1927

Fig. 1.

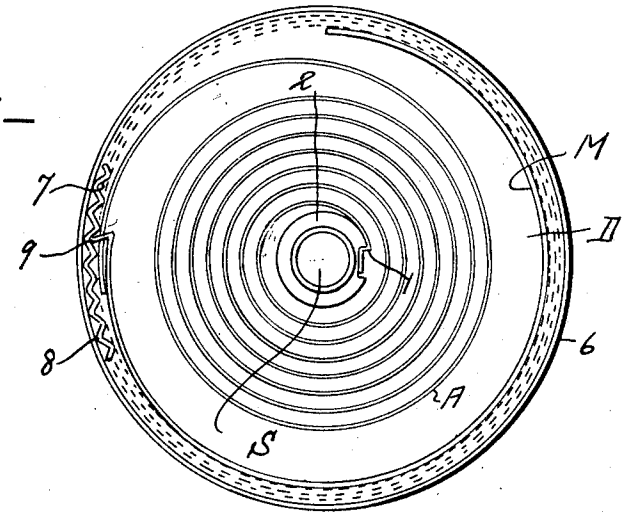


Fig. 2.

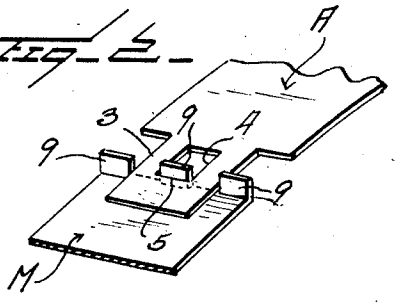


Fig. 3.

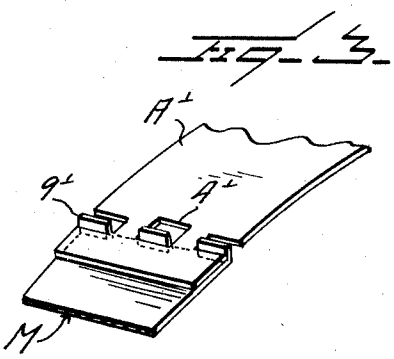


Fig. 5.

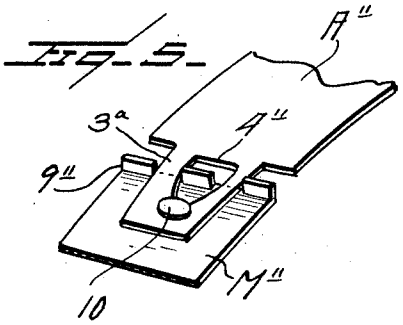
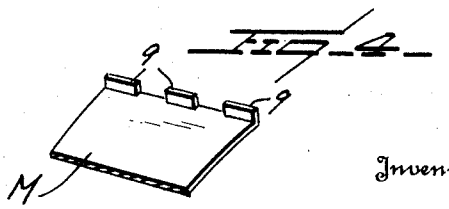


Fig. 4.



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Patented July 10, 1928. 1,677,045

UNITED STATES PATENT OFFICE.

DANIEL E. ODOM, OF BENNETTSVILLE, SOUTH CAROLINA.

SPRING MOTOR.

Application filed January 25, 1927. Serial No. 163,417.

This invention relates to spring motors and primarily it is an improvement on the structure disclosed in my Patent No. 1,520,548, dated December 23, 1924, and the structures shown in my pending application Serial No. 757,153, filed December 20, 1924, and my pending application Serial No. 133,265, filed September 2, 1926.

It is an object of the invention to provide a device of this character comprising a drum and an operating spring associated therewith together with a resilient member having close contact with the drum and wherein the spring and resilient member have coacting means for connecting the same one to the other, a portion of such means normally interlocking with the drum.

It is also an object of the invention to provide a motor of this kind embodying a resilient member having close contact with the drum and with which an operating spring is adapted to be connected, such connection between the spring and resilient member being such as to require a minimum of space within the drum, thus permitting the spring to have a maximum of running action.

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 drawing, wherein:—

Figure 1 is a view in side elevation illustrating a motor constructed in accordance with an embodiment of my invention, a portion of the corrugated member or sleeve as herein embodied being shown partially in full lines with the remainder of said member or sleeve being diagrammatically indicated by broken lines;

Figure 2 is a fragmentary view in perspective illustrating the connection between the spring and resilient member as embodied in Figure 1;

Figure 3 is a fragmentary perspective view illustrating the connection between the spring and resilient member arranged in accordance with a further embodiment of my invention;

Figure 4 is a view in perspective of the end portion of the resilient member with which the spring is engaged;

Figure 5 is a view in perspective illustrating a still further embodiment of connection between the spring and resilient member.

As herein disclosed, a drum D of requisite dimensions is mounted upon a shaft S, the same having relative rotation upon the action of a spring A. The inner end of the spring A, as herein disclosed, is operatively engaged, as at 1, with an arbor 2 mounted upon the shaft S in a conventional manner.

As is particularly illustrated in Figure 2, the outer end of the spring A is provided with a reduced extension 3 provided at the transverse center of the spring A with an opening or slot 4. As illustrated in Figure 2, this slot 4 is rectangular in form although it is only essential that the forward edge wall 5 of the opening or slot 4 be substantially perpendicular to the longitudinal axis of the extension 3 or spring A.

The inner face of the peripheral wall 6 of the drum D is provided with the grooves or channels 7. While these grooves or channels 7 may be formed in such wall proper, in the present embodiment of my invention they are disclosed as constituting corrugations provided in a sleeve 8 snugly fitting within the drum and held to the drum against independent movement in any desired manner.

Having direct contact throughout its major portion with the peripheral wall 6 of the drum, or more specifically the sleeve 8, is a resilient arcuate member M of a length in excess of a semi-circle. The extension 3 of the spring A extends between one end portion of the member M and the sleeve 8 and said extremity of the member M is provided with a plurality of outwardly disposed lips 9. These lips 9 are herein disclosed as three in number spaced apart in a direction transversely of the member M with the intermediate lip 9 at the transverse center of the member M. This intermediate lip 9 is disposed outwardly through the slot 4 in the extension 3 of the spring A and this intermediate lip 9 together with the remaining two lips normally seat within one of the grooves or channels 7.

Upon a turning of the shaft S and arbor

2 to wind the spring A, the tension of the arcuate member M will maintain the outstanding lips or parts 9 within a groove or channel 7 but, when the spring has been wound to the desired predetermined degree the lips or parts 9 will unseat permitting the member M, upon further turning movement of the arbor 2 or shaft S, to have rotation, within the drum D or to slip around therein, thus preventing overwinding of the spring. It will be understood that during this slipping, the lips or outstanding parts 9 passing over the grooves or channels 7 will result in the creation of an audible sound to give notice that the spring A has been placed under desired tension.

It will be observed that the intermediate lip or part 9 normally will have close contact with the edge wall 5 of the opening 4 permitting such relative movement between the member M and the adjacent end portion of the spring A to compensate for any inequalities which may be present in the spring and thus assuring a direct alignment of the spring A and member M.

By having the outer end of the spring A, or more particularly the extension 3, disposed outwardly of the coacting end of the member M, it will be noted that at all times the desired connection between the spring A and member M will be maintained. As is illustrated in Figure 1 wherein the spring A is shown substantially unwound it will be observed that this connection is effectively maintained. As pull is imposed through the spring A upon the member M it will be noted that such pull will at all times be directed upon the intermediate lip 9 and at no time will there be any pull or strain having a tendency to separate the connection. In other words it is to be particularly stated that the connection is such that the pull of the spring A upon the member M will at all times have a tendency to maintain a close connection.

In the embodiment of my invention as illustrated in Figure 3 the outer end of the spring A′ is provided with a plurality of transversely disposed openings or slots 4′ through each of which is disposed outwardly a lip or outstanding part 9′ carried by the member M′. This embodiment may be employed when it is deemed necessary to have greater connecting engagement between the spring and resilient member.

In the embodiment of my invention as illustrated in Figure 5 the extension 3ª of the spring A″ is provided with what is known in the trade as a pear-shaped slot 4″ which is adapted to be operatively engaged with an outstanding stud 10 carried by the adjacent end portion of the resilient member M″. This direct connection between the spring A″ and the member M″ will permit such relative movement between these parts to maintain the same in desired alignment. The member M″ is also provided with the outstanding lips or parts 9″ the intermediate one of which being disposed outwardly through the inner portion of the slot 4″.

In order to assure the most effective action of the lips or outstanding parts 9, 9′ or 9″ it is preferred that the same be disposed rearwardly on a predetermined incline preferably at an angle of approximately seventy degrees.

Attention is directed to the fact that with the connection as illustrated in Figure 5, particularly as pertains to the stud 10 engaging within the slot 4″, the same advantages will be obtained as pertains to the pull imposed upon the spring A″ as hereinbefore stated in detail in connection with the embodiment of my invention as particularly illustrated in Figures 1 and 2.

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 a shaft, a drum mounted thereon having a grooved peripheral wall, a spiral spring surrounding the shaft and having its inner end portion engaged therewith, the outer end portion of the spring being provided with an opening, an arcuate resilient member within the drum, the outer extremity of the spring extending between the resilient member and the peripheral wall of the drum, and an outstanding part carried by the resilient member and extending through the opening in the spring to seat within a groove of the drum.

2. In combination with a shaft, a drum mounted thereon having a peripheral wall, a spiral spring surrounding the shaft and having its inner portion engaged therewith, an arcuate resilient member having contact with the peripheral wall of the drum, the outer portion of the spring extending between the resilient member and the peripheral wall of the drum, said outer end portion of the spring having an opening, and an outwardly directed part carried by the resilient member and extending through the opening in the spring for connecting the spring to the resilient member.

3. In combination with a shaft, a drum mounted thereon having a peripheral wall,

a spiral spring surrounding the shaft and having its inner portion engaged therewith, an arcuate resilient member having contact with the peripheral wall of the drum, said resilient member extending only partially around said peripheral wall, the outer portion of the spring extending between an end portion of the resilient member and the peripheral wall of the drum, said outer portion of the spring and the resilient member having coacting means to connect one to the other.

In testimony whereof I hereunto affix my signature.

DANIEL E. ODOM.