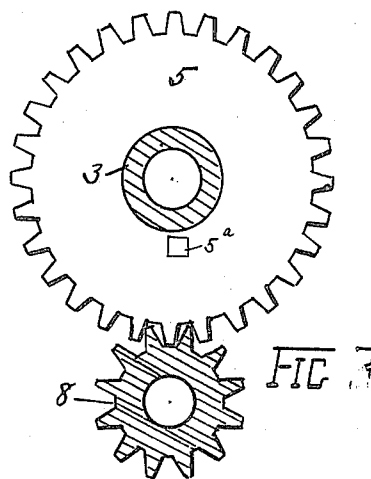
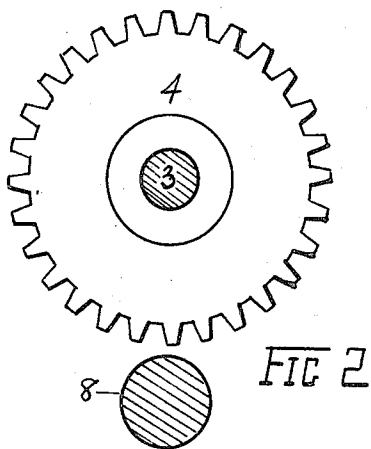
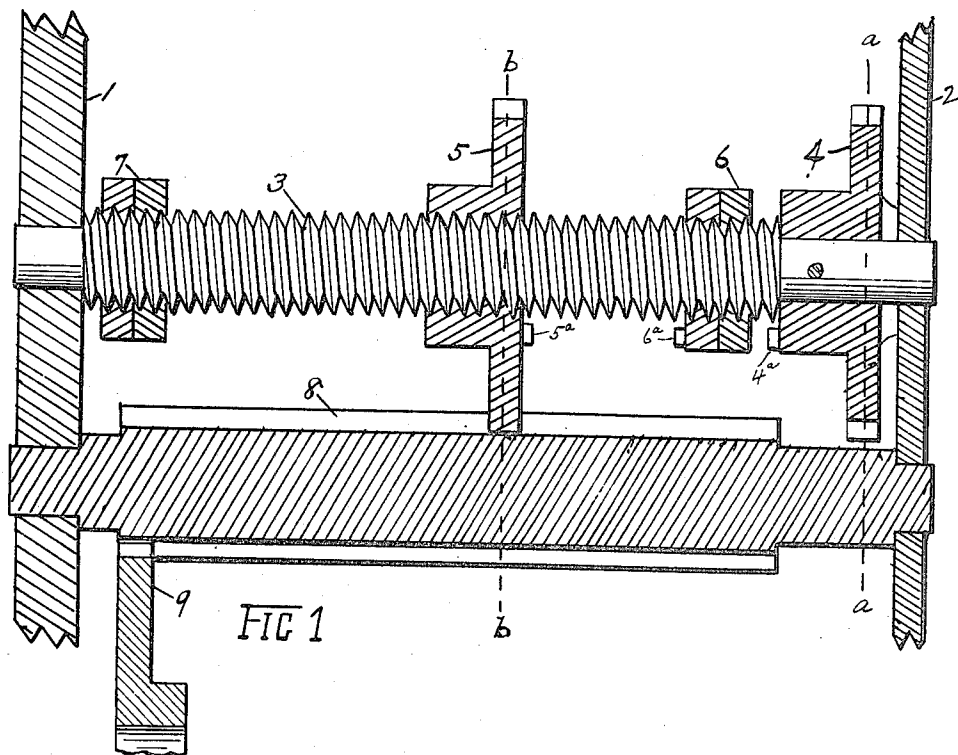


G. WENZELMANN.
WINDING GOVERNOR FOR SPRING MOTORS.
APPLICATION FILED JULY 16, 1917.

1,283,386.

Patented Oct. 29, 1918.



WITNESSES:

O. J. Bolton
A. L. Bolton

INVENTOR.

Gustave Wenzelmann.

UNITED STATES PATENT OFFICE.

GUSTAVE WENZELMANN, OF GALESBURG, ILLINOIS.

WINDING-GOVERNOR FOR SPRING-MOTORS.

1,283,386.

Specification of Letters Patent.

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Application filed July 16, 1917. Serial No. 180,717.

To all whom it may concern:

Be it known that I, GUSTAVE WENZELMANN, residing at Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Improvement in Winding-Governors for Spring-Motors, of which the following is a specification.

This invention relates to spring motors in which power is stored by winding one or more spiral band-springs and is transmitted by means of gearing driven by the release of spring tension and adapted to drive mechanism for producing the desired motion.

The object of this invention is to provide means for stopping the winding operation at the proper limit of spring tension and thus prevent over-winding and the damage that might result.

In the accompanying drawings, Figure 1 shows part of the frame of a spring motor with my device mounted therein. Fig. 2 shows a sectional view on a line a little to the right of line *a-a* of Fig. 1, and Fig. 3 is a sectional view on a line a little to the right of line *b-b*, Fig. 1.

At 1, 2 of the drawings, parts of the frame of a spring motor are shown. Journaled in said frame is shaft 3 having gear 4 securely mounted near one end thereof and having the remainder of its surface, between frame parts 1 and 2, provided with a screw thread of suitable shape and pitch. On this threaded part of shaft 3 is concentrically mounted gear 5 threaded to match, and on the same shaft are placed adjustable stop-nuts 6 and 7. Gear 5 is provided with a lug 5^a, and stop-nut 6 has a similar lug, 6^a. These are so placed that whenever gear 5 approaches stop-nut 6 lug 5^a will strike against lug 6^a and thus prevent gear 5 from being screwed against nut 6 in such a manner as to cause them to stick together by friction. 8 is a gear pinion journaled in frame parts 1 and 2 in mesh with gear 5 and also with gear 9, which is either the main driving gear of the motor or an intermediate gear in the driving train. Gear 4, on shaft 3, is either made a part of the winding gear of the motor or is so mounted as to be driven by said winding gear.

The operation of my device is as follows: Whenever winding of the mechanism is being done, gear 4 and shaft 3 are caused to revolve and gear 5, on account of its screw connection with shaft 3, travels along said shaft toward stop-nut 6. Pinion 8 is ex-

tended as shown so as to be always in mesh with gear 5, and gear 5 is thus prevented from turning except as driven by pinion 8.

At the first winding operation after my device has been installed, the winding is continued carefully until the desired spring tension is produced. Then stop-nut 6 is screwed toward gear 5 until lug 6^a strikes lug 5^a, thus forming a fixed limit for the travel of gear 5 in that direction during any subsequent winding operations. In actual manufacturing practice, stop-nuts 6 and 7 may easily be dispensed with by making shaft 3 and gear 5 with threads so planned that gear 4 will form a stop for said gear 5 at the end of the proper winding period. In that case, lug 4^a on gear 4 coacts with lug 5^a in preventing the locking together by friction of gears 4 and 5.

Whenever the motor is allowed to perform its driving function, gear 9 causes pinion 8 to revolve and to cause gear 5 to revolve on shaft 3 and to travel away from lock-nut 6. The operation of the motor may be allowed to continue until its available power is exhausted or nearly so. Stop-nut 7 may then be adjusted to limit the travel of threaded gear 5 in that direction.

It will be understood that gears 4 and 5 must be so proportioned and driven that the operation of the motor for any part or all of its available power supplying period will cause gear 5 to revolve on threaded shaft 3 the exact number of turns that it will be necessary to impart to gear 4 and shaft 3 in order to restore the proportion of spring tension released by said period of operation.

The drawings and specifications show and describe only one method of mounting and operating my device. Variations may be found desirable in the manner of its application or necessary in adapting it to spring motors of varied types. Such variations do not form departures from the principle and purpose of my invention. For instance the motion of threaded gear 5 on shaft 3 may be reversed, either by reversing the direction of revolution of said shaft 3 or by using a left hand screw instead of right hand. In either case the direction of revolution of pinion 8 must be correspondingly arranged and stop-lugs similar to lug 5^a must be provided to prevent friction-locking of the parts drawn together in the winding operation.

The same governing action of my device will result if pinion 8, instead of gear 4, is driven from the winding gear of the motor and this may be found preferable. In that case gear 4, instead of pinion 8, should be driven by the driving gear of the motor, and screw-mounted gear 5 may be made to travel in either direction desired on threaded shaft 3, according to the direction of revolution arranged for shaft 3 and pinion 8 and the character of thread provided on shaft 3 and in gear 5, whether made right hand or left hand. Any device or variation producing the governing action described is within the scope of my invention.

By these means the operation of my device is rendered entirely automatic. Winding of the motor may be done at any time when the spring tension has been partly or entirely used. The winding operation can never be continued beyond the predetermined safe spring tension and, by adjusting stop-nut 7, the operation of the motor may be automatically stopped before the spring tension is entirely released.

I claim as my invention and desire to secure by Letters Patent:

1. A spring motor frame, a threaded shaft mounted therein and adapted to be driven by the winding mechanism of the motor and a threaded gear mounted on said threaded shaft and caused to travel thereon in one direction by the revolution of the threaded shaft and in the opposite direction by the revolution of said threaded gear, said last mentioned revolution being caused by the release of spring tension operating through the driving gear of the motor.

2. A spring motor frame, a threaded shaft mounted therein and adapted to be driven by the winding mechanism of the motor, a threaded gear mounted on said threaded shaft and caused to travel thereon in one direction by the revolution of the said threaded shaft during the winding operation and in the opposite direction by the revolution of said threaded gear, said last mentioned revolution being caused by the release of spring tension operating through the driving gear of the motor, and an adjustable stop adapted to limit the travel of said threaded gear on said threaded shaft, thereby limiting the winding operation.

3. A spring motor frame, a threaded shaft mounted therein and adapted to be driven by the winding mechanism of the motor, a threaded gear mounted on said threaded shaft and caused to travel thereon in one direction by the revolution of the said threaded shaft during the winding operation and in the opposite direction by the revolution of said threaded gear, said last mentioned revolution being caused by the release of spring tension operating through the driving gear of the motor, and adjustable stops adapted to limit the travel of said threaded gear on said threaded shaft, thereby limiting the winding operation and the release of spring tension.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, this 13th day of July, A. D. 1917.

GUSTAVE WENZELMANN.

Witnesses:

F. L. CONGER.

J. ANDERSON.