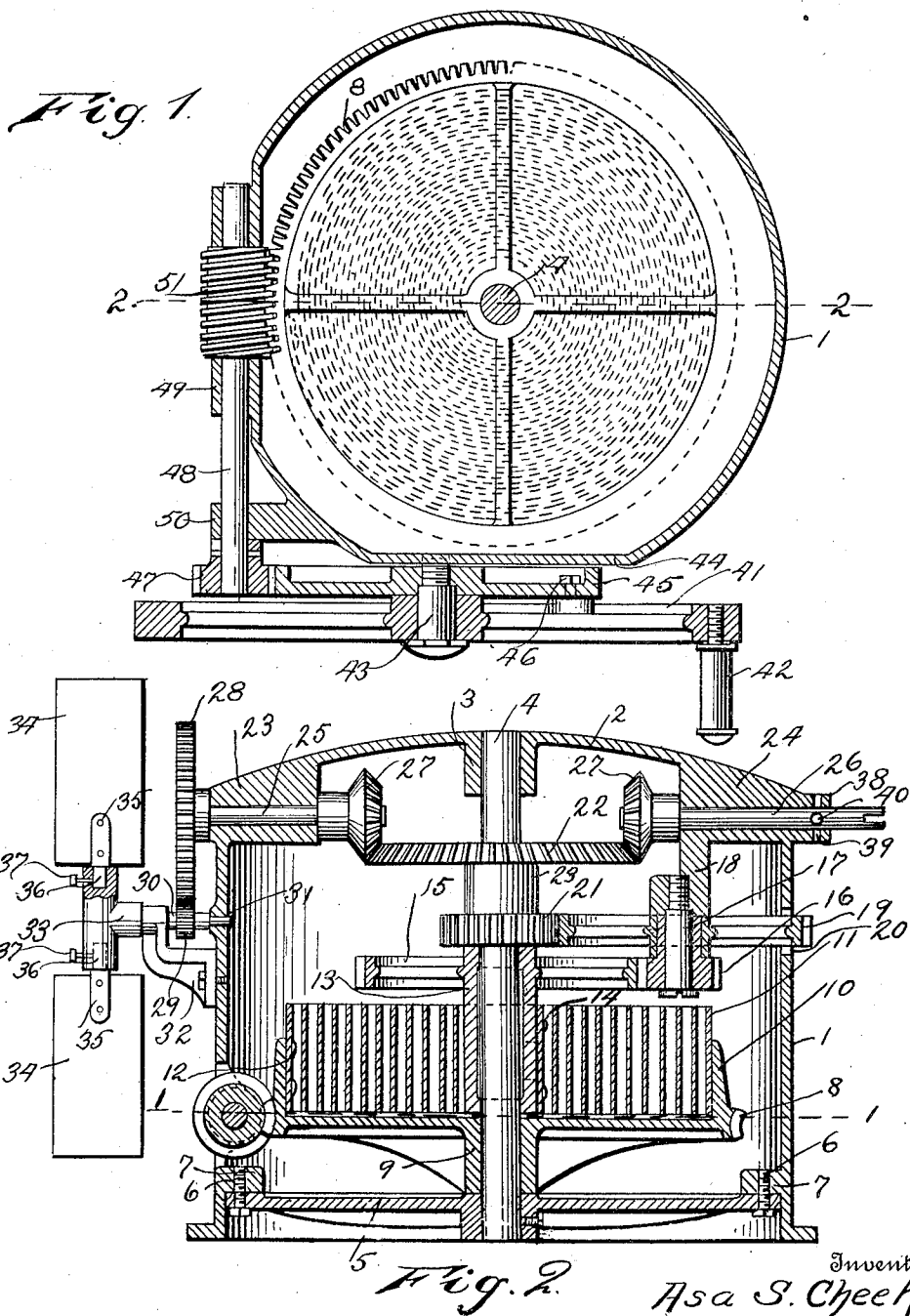


A. S. CHEEK.
 SPRING MOTOR.
 APPLICATION FILED APR. 9, 1912.

1,058,409.

Patented Apr. 8, 1913.



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SPRING-MOTOR.

1,058,409.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed April 9, 1912. Serial No. 689,524.

To all whom it may concern:

Be it known that I, ASA S. CHEEK, a citizen of the United States, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Spring-Motors, of which the following is a specification.

The present invention relates to a spring motor.

An important object of this invention is to provide a device of the above mentioned character, which is simple and compact in construction, positive and reliable in operation, and durable.

A further object of this invention is to provide novel adjustable means for regulating the speed of the device when in operation.

A further object of this invention is to provide novel means to wind the spring of the motor, which means cannot be operated in a reverse direction by the spring, to permit the same to unwind.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a horizontal sectional view taken on line 1—1 of Fig. 2, and, Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1.

In the drawings wherein for the purpose of illustration, I have shown a preferred embodiment of my invention, the numeral 1 designates an upstanding preferably cylindrical casing, having its upper end closed by a top or dome 2. This top or dome is provided centrally thereof with a depending sleeve or boss 3, which receives the upper end of a main vertically disposed shaft 4, the lower end of which is disposed within an opening formed in a horizontal bracket 5, midway the ends thereof. The horizontal bracket 5 is rigidly connected at its ends by bolts 6 or the like with inwardly extending ears 7, formed upon the casing 1.

Rigidly mounted upon the main shaft 4 is a combined worm-wheel and spring box 8, which is held in spaced relation from the bracket 5 by a spacing sleeve 9, as shown. The worm-wheel 8 is provided with an upstanding annular flange 10, which forms with said worm wheel a box or receptacle

within which is placed a coil spring 11 of suitable stiffness, depending upon the power which is to be derived from the device. The coil spring 11 has its outer end attached to the annular flange 10, as shown at 12, and the inner end of this coil spring is attached to a sleeve 13, as shown at 14. The sleeve 13 is freely rotatable upon the main shaft 4 and has a large pinion 15 rigidly connected therewith, this sleeve and pinion being preferably cast integral, as shown. The large pinion 15 engages a small pinion 16, which is rotatably mounted upon a depending stub shaft 17, rigidly mounted upon a depending arm or bracket 18, which is preferably cast integral with the top or dome 2. Disposed above and adjacent the smaller pinion 16 is a large pinion 19, rigidly connected therewith and extending slightly outwardly of the casing 1, through an opening 20, as shown. Disposed above and adjacent the upper end of the sleeve 13 is a smaller pinion 21, which is free to rotate on the main shaft 4 independently of said sleeve 13. The smaller pinion 21 is driven by the large pinion 19. Disposed above the smaller pinion 21 is a large bevel-gear 22, rigidly connected with the smaller pinion 21 by means of a spacing sleeve 23, such elements being preferably cast integral.

The top or dome 2 is provided at preferably diametrically opposite points with depending blocks 23 and 24, provided with horizontal openings, through which extend rotatable horizontal shafts 25 and 26. These shafts have small bevel-gears 27 rigidly connected with their inner ends, which small bevel-gears engage the large bevel gear 22. Rigidly mounted upon the outer end of the horizontal shaft 25 is a large pinion 28, which engages a small pinion 29, rigidly mounted upon a horizontal fan shaft 30. This shaft has its inner reduced end rotatably mounted in an opening 31 formed through the casing 1 and the outer portion of the shaft is journaled through the head of a fixed bracket 32, as shown. Rigidly mounted upon the outer end of the shaft 30 is a hub 33, of a fan, which constitutes a speed regulating device for the spring motor. This fan further comprises blades 34, carried by holding elements 35, having reduced cylindrical extensions 36, which fit within cylindrical openings formed in the ends of the hub 33. Clamping bolts 37 are carried by the hub 33 to engage the reduced

extensions 36. It is thus seen that the angular positions of the plates 34 may be adjusted and that they may be held in such adjusted positions by the clamping blades 37, to regulate the speed of the spring motor. The shaft 26 is connected to the machine or device which is to be driven by the spring motor, by any suitable means.

When the spring motor is not in use, it is advantageous to provide some means for preventing the rotation of the shaft 26. To accomplish this I provide an extension 38 of the top 2 with a vertical or transverse opening 39 adapted to have registration with a transverse opening 40 formed through the shaft 26. A bolt or the like (not shown) may be passed through the openings 39 and 40 and will serve to hold the shaft 26 against rotation.

The means to wind the spring 11 comprises a hand wheel 41, provided with a crank handle 42. This hand wheel is rotatably mounted upon a stub shaft 43, which is rigidly connected with a flat portion 44 of the casing 1. Disposed between the flat portion 44 and the hand wheel 41 is a large pinion 45, which is bolted to the hand wheel 41, as shown at 46, to rotate therewith. This large pinion engages a small pinion 47 which is rigidly mounted upon one end of a horizontal shaft 48, journaled through fixed bearings 49 and 50, as shown. The shaft 48 is provided with a worm 51, engaging the worm wheel 8.

The operation of the device is as follows:—To wind the spring 11, the operator takes hold of the crank handle 42 and rotates the hand wheel 41, which rotation is imparted through pinions 45 and 47 at an increased speed to the worm 51, which in turn rotates the worm wheel 8. It is thus seen that the worm 51 is capable of rotating the worm wheel 8 but the spring 11 cannot rotate the worm wheel 8 in a reverse direction to turn the worm 51, whereby the spring would be unwound. Assuming that the spring is wound and that the shaft 26 is free to rotate, the rotation of the sleeve 13 will be imparted, through the medium of the train of gears including pinions 15, 16, 19 and 21, to the bevel-gear 22, at a greatly increased speed. The bevel-gear 22 rotates the small bevel-gears 27 and their shafts at a further increased speed. The fan or speed regulator is rotated by the shaft 25 at an increased speed through the medium of pinions 28 and 29. It is thus seen that the fan will control the speed of rotation of the shaft 25, which speed of rotation may be effected by angularly adjusting the plates 34 to offer more or less resistance to the air, as the case may be.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the

same and that certain changes in shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In a spring motor of the character described, an upstanding casing having its upper end closed, a stationary bearing mounted within the lower portion of said upstanding casing, an upstanding central shaft disposed within the casing and connected with said stationary bearing and with the upper closed end of said casing, a worm-wheel provided with an upstanding flange forming a spring box, a large pinion having a sleeve rigidly connected therewith and rotatably mounted on said central shaft within the spring box, a spring disposed within the spring box and having one end thereof attached to said flange and the other end attached to said sleeve, a small pinion rotatably mounted within the upstanding casing and driven by said large pinion, a second large pinion rigidly connected with the small pinion, a second small pinion rotatably mounted on the central shaft to one side of the first named large pinion and driven by the second named large pinion, a bevel-gear rotatable upon the central shaft and rigidly connected with the second named small pinion, diametrically arranged small bevel-gears disposed within the upper portion of said casing in engagement with the large bevel-gear, a power distributing shaft connected with one small bevel-gear, a rotatable shaft connected with the other small bevel-gear, a rotatable fan driven by the last named shaft, a shaft provided with a worm to engage the worm-wheel, a pinion rigidly mounted upon one end of the last named shaft, a pinion rotatably mounted upon the outer surface of the casing and in engagement with the last named pinion, and a fly wheel adapted to the manually rotated and rigidly connected with the last named pinion.

2. In a spring motor of the character described, an upstanding main shaft, a worm-wheel provided with an annular flange forming a spring box and rotatably mounted upon the main shaft, small and large gears independently rotatably mounted upon the main shaft near and above the spring box, a spring disposed in the spring box and having one end connected therewith and its opposite end connected with the large gear, a train of gears disposed between the large and small gears, a bevel-gear mounted upon the main shaft above the small gear and rigidly connected with the same, substantially diametrically bevel-gears engaging the first named bevel-gear, horizontal shafts connected with said diametrically arranged

wheel-gears, a fan connected with one horizontal shaft, means to turn the worm-wheel including a worm, and an upstanding casing surrounding the main shaft and all of the elements carried thereby.

3. In a spring motor of the character described, an upstanding main shaft, a supporting structure to retain the same in place, a horizontal worm-wheel provided with an annular flange forming a spring box and rotatably mounted upon the main shaft, a spring disposed within the spring box and having one end thereof connected therewith, a gear rotatably mounted upon the main shaft and connected with the opposite end

of the spring, a second gear rotatably mounted upon the main shaft, a train of gears between the first and second named gears, a speed control device driven by the second named gear, a power distributing shaft driven by said second named gear, and means including a worm to rotate the worm-wheel to wind up the spring.

In testimony whereof I affix my signature in presence of two witnesses.

ASA S. CHEEK

Witnesses:

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