(No Model.)

C. F. SHEHAN.

Spring Motor.

No. 238,061. Patented Feb. 22, 1881.

Fig. 1

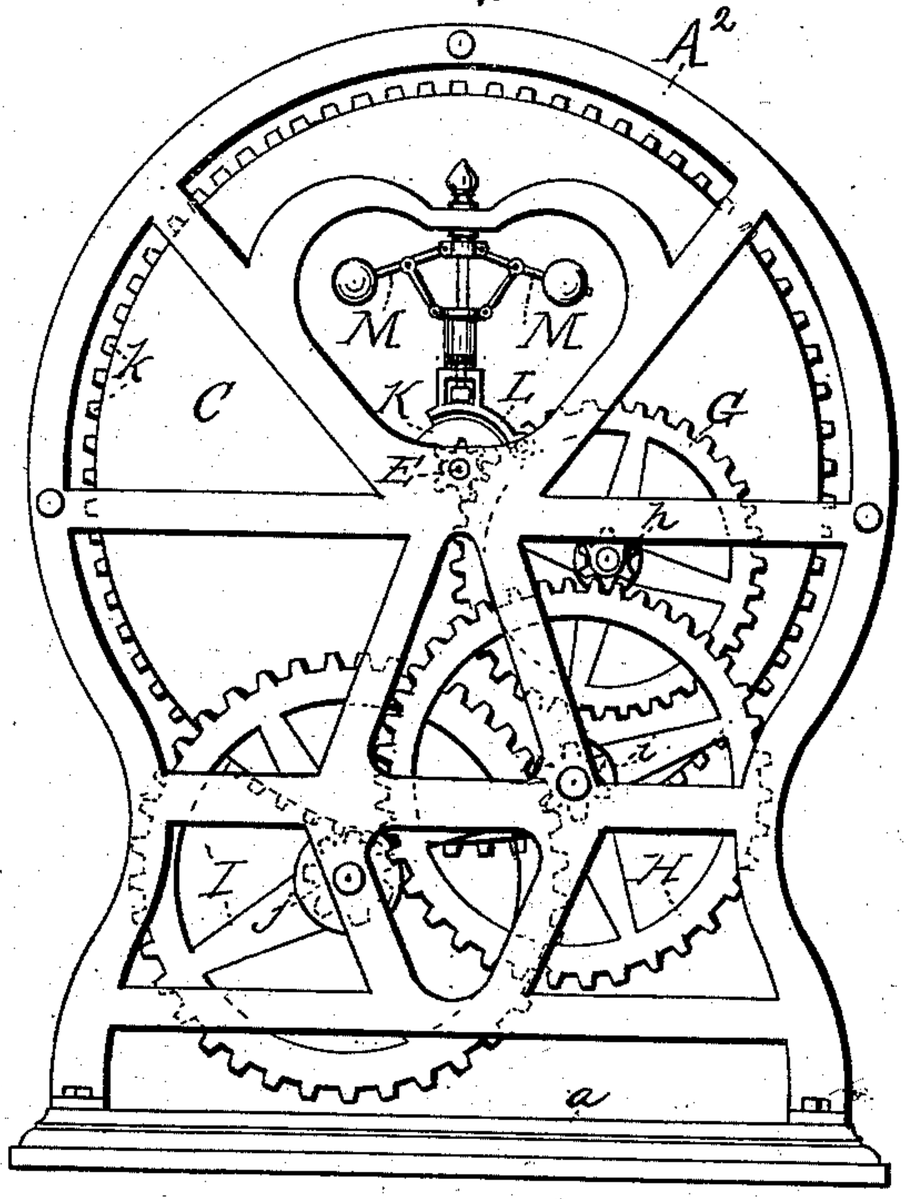


Fig. 2

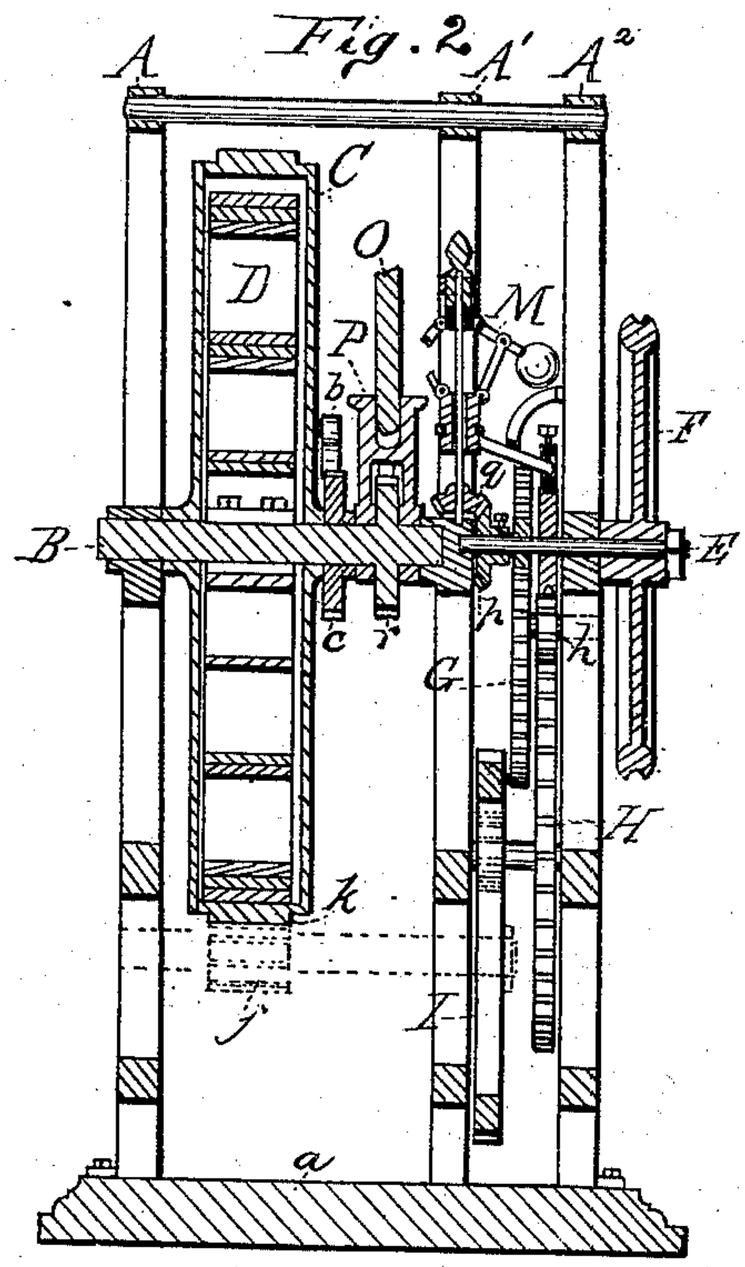


Fig. 3

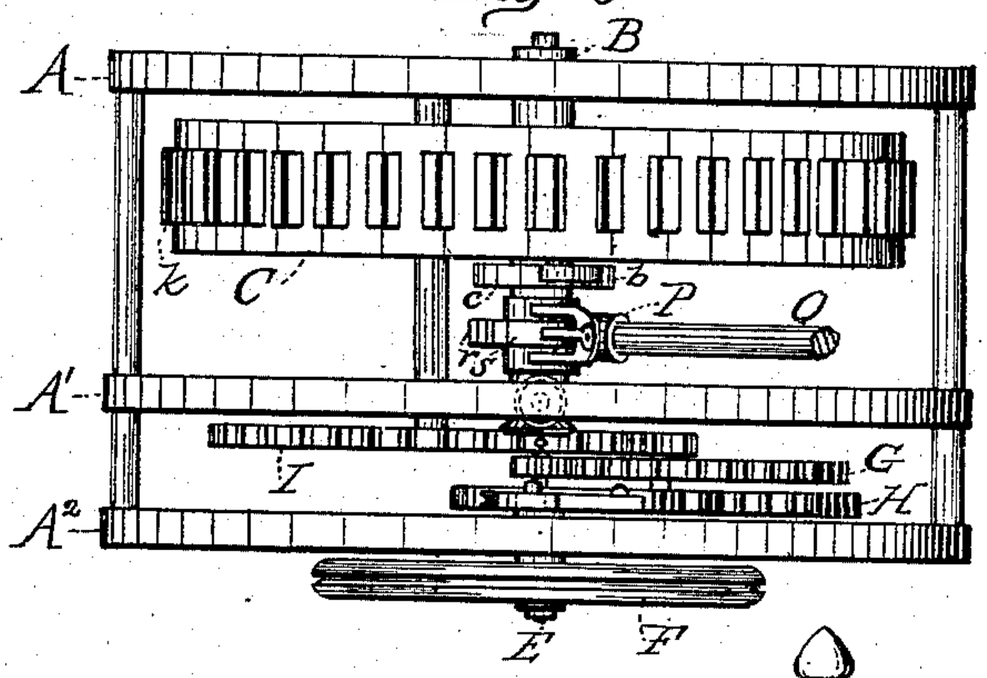


Fig. 4

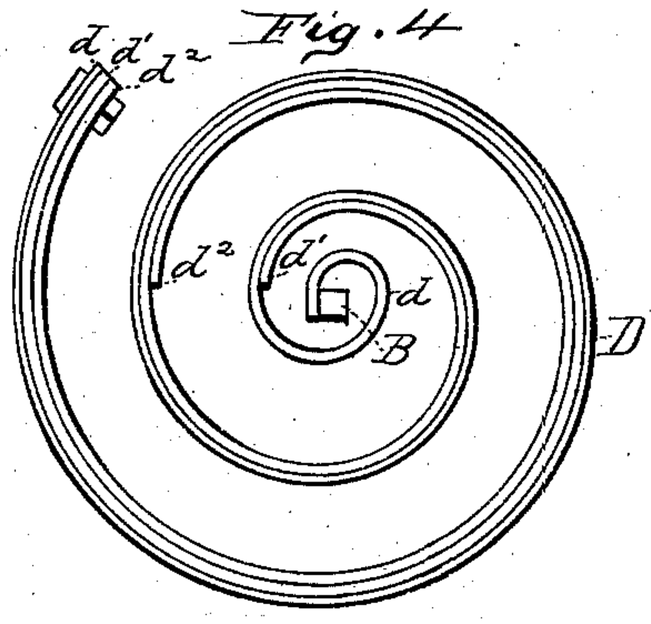


Fig. 5

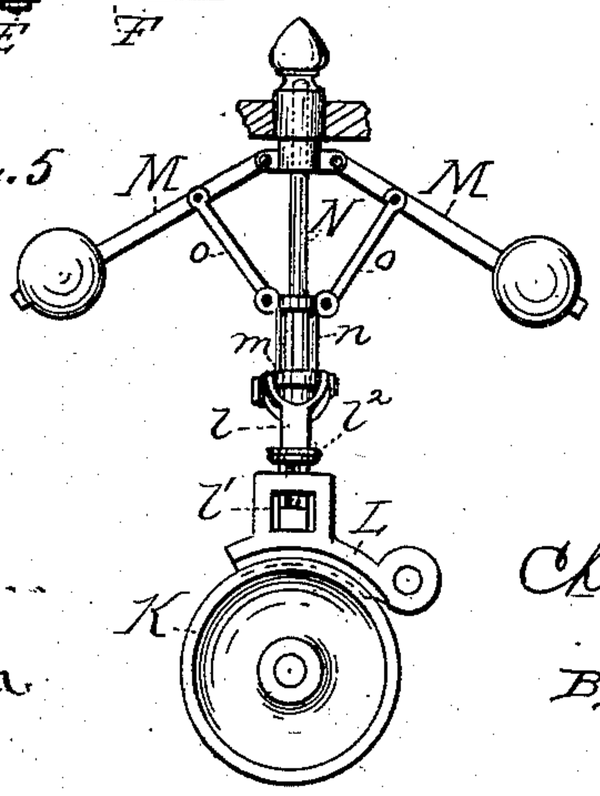
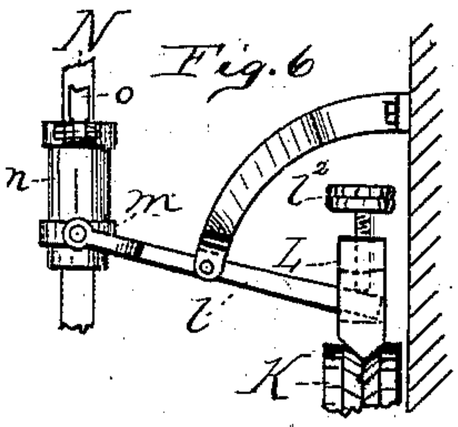


Fig. 6



WITNESSES

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CHRISTOPHER F. SHEHAN, OF CHICAGO, ILLINOIS.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 238,061, dated February 22, 1881.

Application filed November 12, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER F. SHEHAN, of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Spring-Motors, of which the following is a specification.

The object I have in view is to produce a spring-motor for running sewing-machines and other light machinery, which will be exceedingly compact in construction and will be capable of running for a great length of time with an uniform exertion of power, will be under complete control, and can be wound up readily and in a short time.

My invention consists in the peculiar novel devices and combinations of devices employed by me for this purpose, as fully hereinafter explained, and pointed out by the claims.

In the accompanying drawings, forming a part hereof, Figure 1 is an elevation of the motor; Fig. 2, a central vertical section of the same; Fig. 3, a top view of the machine; Fig. 4, a separate elevation of the peculiar spring removed; Fig. 5, a separate front elevation of the governor and brake, and Fig. 6 a side elevation of a portion of the same.

Like letters denote corresponding parts in all the figures.

The parts of the motor are preferably supported by three vertical frames, A A′ A², connected together and secured to a base, *a*.

There is journaled in central bearings in the frames A A′ a shaft, B, upon which is sleeved the drum C, containing the spring. This spring-drum is secured to the shaft, so as to turn in one direction therewith, by a pawl-and-ratchet connection, *b c*.

D is the spring from which the motive power is derived. This spring is a flat spiral, and is formed of several leaves, (preferably three,) *d d′ d²*, of different lengths. The outside leaf, *d*, is secured to the shaft B at its inner end, and at its outer end to the drum C in any suitable manner. The other leaves, *d′ d²*, are located within the leaf *d*, and are secured thereto at their outer ends. Each inner leaf, however, is shorter than the next outer leaf, and is free at its inner end. The first inner leaf, *d′*, terminates at a point short of the inner end of the outer leaf, *d*, and the next inner leaf, *d²*, at a point short of the free end of the leaf *d′*, and so on, if other leaves are used. A compound spring constructed in this manner has great power, acts uniformly, and can be wound into a smaller compass than a simple spring of same power. If the leaves of the compound spring were all secured together at their inner ends such spring could not be wound close to the shaft B, would consequently not be so compact, would not act uniformly or run for such a great length of time as when the leaves are of graduated length, and are secured together and to the drum at their outer ends.

In line with the shaft B is journaled, in the frames A′ A², the driving-shaft E, on the end of which is a belt-wheel, F, around which a belt passes to the machine to be driven. This shaft is connected with the spring-drum C by a train of speed-gearing, composed of wheels G, H, and I, and pinions *g*, *h*, *i*, and *j*. The pinion *j* meshes with teeth *k* on the periphery of the spring-drum C, and is connected by a shaft with the wheel I.

To regulate the speed of the machine I employ a brake, which is operated by an ordinary ball-governor.

K is the brake-wheel, which is secured to the driving-shaft E. A brake-shoe, L, is pivoted to the frame A² and bears upon such wheel. This brake-shoe is connected by a lever, *l*, with a collar, *m*, in which turns a vertically-sliding sleeve, *n*, connected by links *o* with the ball-arms M. These ball-arms are pivoted to a collar secured to the governor-spindle N, which spindle is revolved by the driving-shaft E through bevel-gears *p q*. The lever *l* projects into a slot, *l′*, in the brake-shoe, and a set-screw, *l²*, regulates the point at which the lever will commence to lift the shoe off of the wheel. A spring may be placed under the end of the lever *l*, and between it and the brake-shoe, so that such shoe will be applied with an elastic pressure. The upward movement of the balls applies the brake, while their downward movement lifts such brake, as will be readily understood.

For winding up the spring when run down I employ a long lever, O, which can be placed removably in a socket, P, having legs straddling and ratchet-wheel *r* secured to the shaft B. A pawl, *s*, carried by the socket P, works on the ratchet-wheel *r*, and turns the spring-

shaft B when the lever O is moved. This lever can be worked up and down like a pump-handle, and when the spring is wound up it can be removed from the socket.

The machine will be made to give the power required for the work it is designed to perform, and, as before stated, it will be exceedingly compact, will run for a great length of time with evenness of power, and its speed will be under complete control.

Since the spring can be made very powerful within a small compass, as described, the gearing can be constructed to multiply the speed of the spring-drum to such an extent that the motor will run for a long time.

In a motor for sewing-machines the parts would be arranged so that it would only be necessary to wind up the spring once a day, or twice at the most.

I am aware that a coiled spring for a motor has been provided with an auxiliary spring coiled therewith along a portion of its length, and attached to the mainspring by lips at its ends, so that it can be adjusted lengthwise on such mainspring; and I hereby disclaim the invention of a spring constructed in that manner.

What I claim as my invention is—

1. In a spring-motor, the compound spiral spring D, composed of leaves *d d' d²*, of different lengths, secured together and to the spring-drum at their outer ends, the outer leaf only of the spring being secured to the winding-shaft, substantially as described and shown.

2. In a spring-motor, the combination, with the power-spring, the speed-gearing, and the driving-shaft, of a brake-wheel and brake-shoe, and a governor connected with such brake-shoe for automatically operating the same, substantially as described and shown.

3. In a spring-motor, the combination, with the power-spring, the speed-gearing, and the driving-shaft E, of the brake-wheel K, secured to such driving-shaft, the brake-shoe L, and the governor ball-arms M, revolved by beveled gears from the driving-shaft, and connected with the brake-shoe by the lever *l*, substantially as described and shown.

4. The combination, in a spring-motor, of the graduated compound spring, the speed-gearing, the brake, and the governor operating the brake, substantially as described and shown.

5. In a spring-motor, the combination, with the spring D and winding-shaft B, having ratchet *r*, of the socket P, sleeved on such shaft, and having pawl *s*, and the lever O, substantially as described and shown.

CHRISTOPHER F. SHEHAN.

Witnesses:
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