(No Model.)

H. WESTPHAL.

SPRING MOTOR.

No. 413,356. Patented Oct. 22, 1889.

Fig. 1.

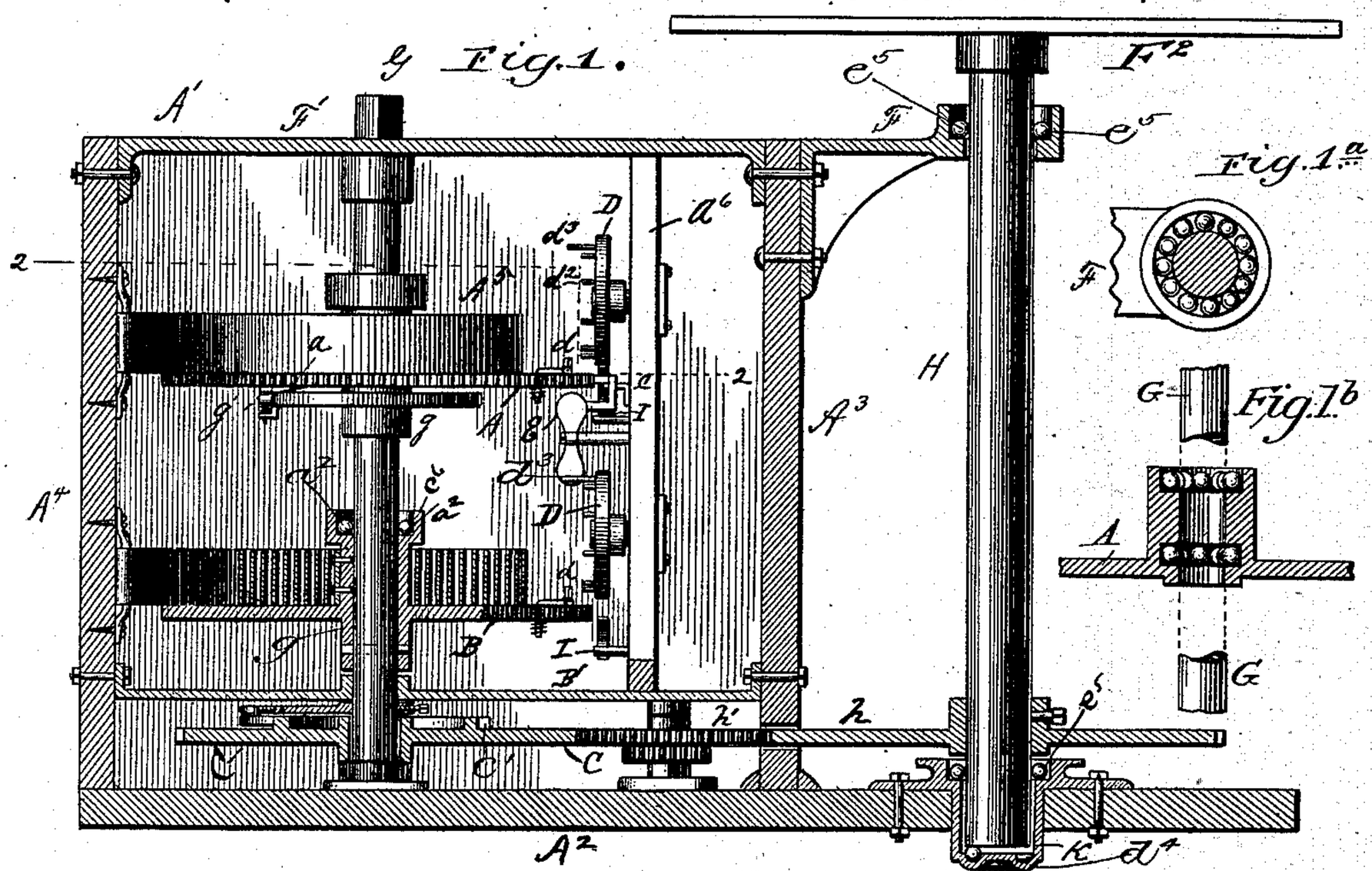


Fig. 1a.

Fig. 1b.

Fig. 4.

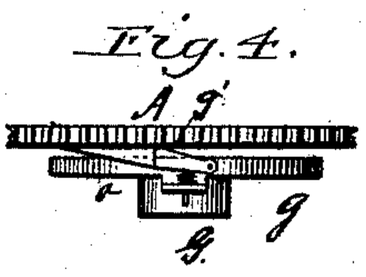


Fig. 2.

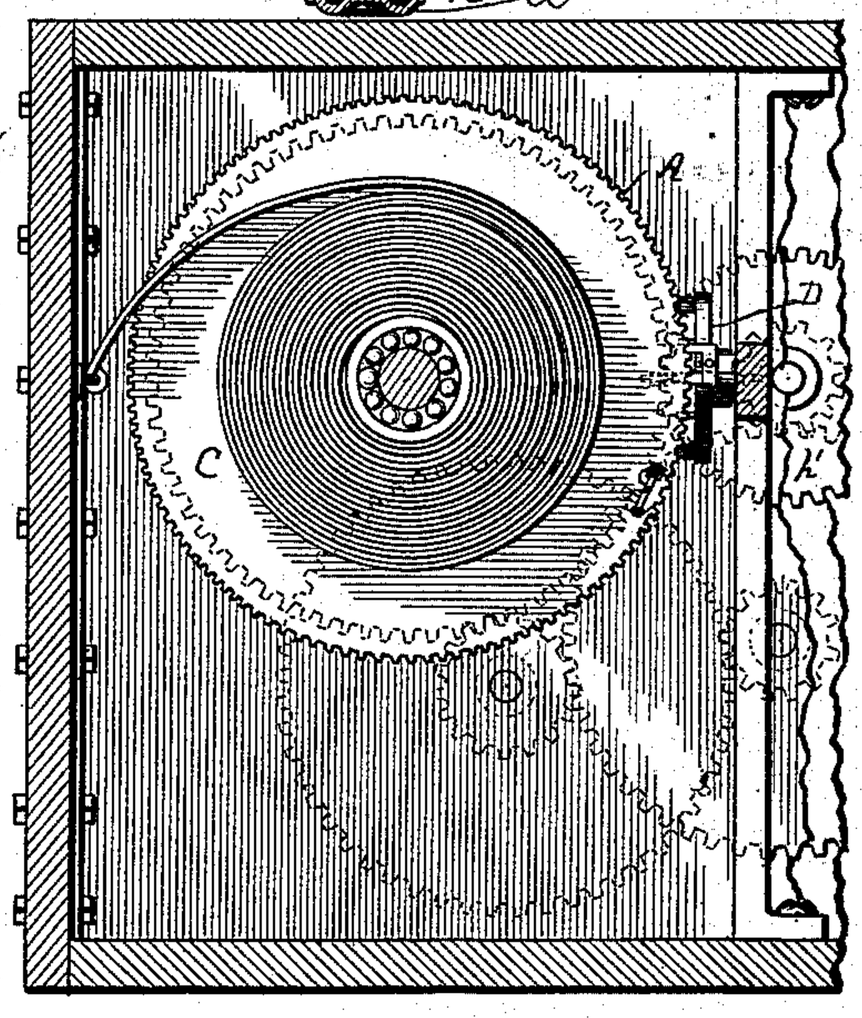


Fig. 3.

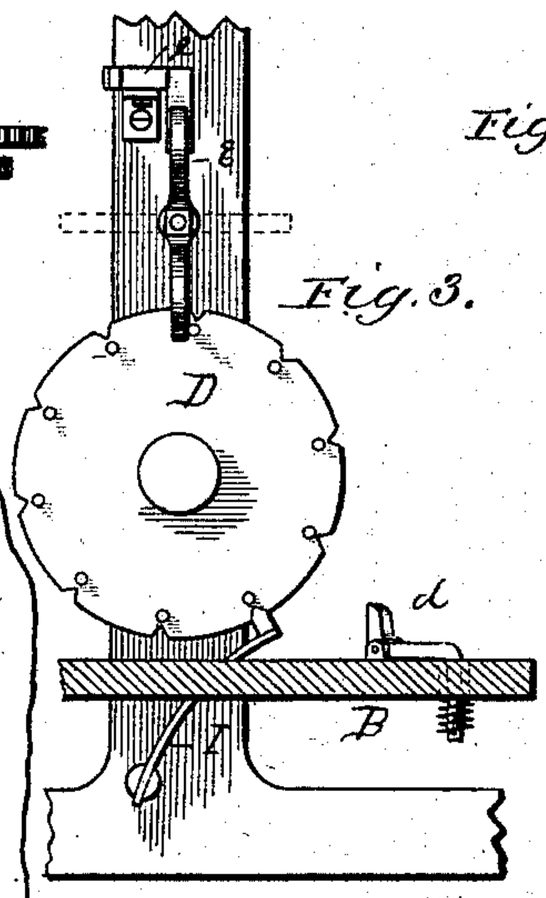


Fig. 3a.

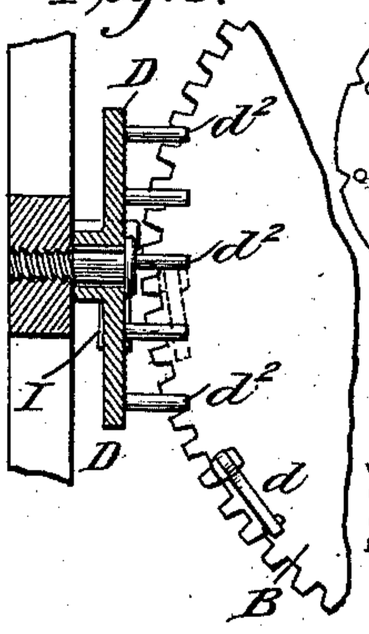


Fig. 5.

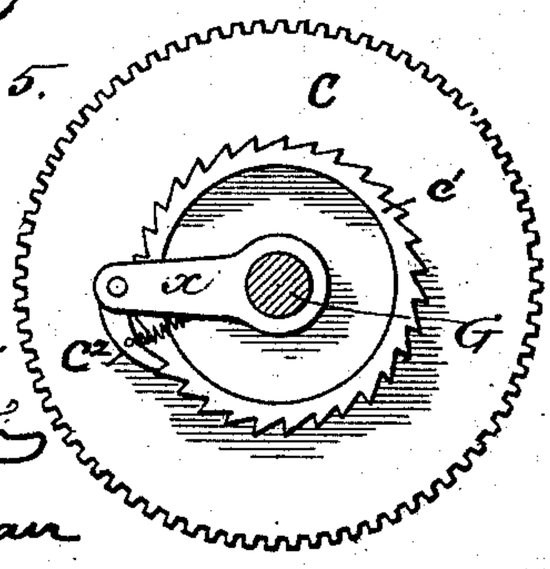
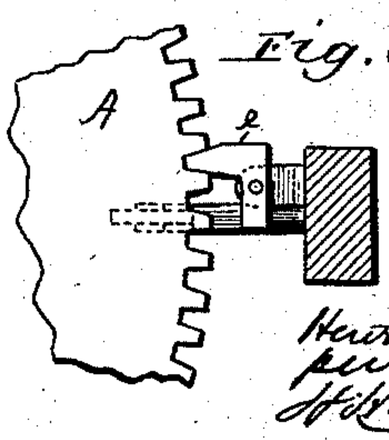


Fig. 6.



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Atty.

UNITED STATES PATENT OFFICE.

HENRY WESTPHAL, OF CHICAGO, ILLINOIS.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 413,356, dated October 22, 1889.

Application filed October 15, 1888. Serial No. 288,175. (No model.)

To all whom it may concern:

Be it known that I, HENRY WESTPHAL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring-Motors, of which the following is a specification, to wit:

This invention relates to improvements in spring-motors for showing goods; and it consists in certain peculiarities of the construction and arrangement of the parts, as will be hereinafter more fully set forth and described, and pointed out in the claims.

To enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a central vertical section of my invention. Fig. 1ª is a detail view of bearing F. Fig. 1ᵇ is a detail view of the shaft G, showing the anti-friction rollers or balls. Fig. 2 is a detail horizontal section on line 2 2 of Fig. 1, showing anti-friction rollers and power-spring. The gear-wheels and pinions shown in this figure are not shown in Fig. 1, but are a portion of an ordinary train of gearing. Fig. 3 is a detail elevation of pin-wheel D, pin-wheel trip *d*, and a portion of large spring-wheel B, on which the pin-wheel trip is pivoted. Fig. 3ª is a detail view taken on a horizontal line through disk or pin-wheel D. Fig. 4 is a detail elevation of spring-wheel A and ratchet *a*, showing it in contact with spring-pawl *g'* on collar *g*, which is rigid with shaft G. Fig. 5 is a detail view of the drive-gear C and its ratchet and pawl, and Fig. 6 is a detail plan view of the release-stop *e* for spring-wheel A.

Similar letters refer to like parts in the several views.

A' is a frame-work consisting of a bottom and side plates and upright standards between, and connected therewith are the several parts of my device, as will be presently explained.

A^2 is the bottom plate.

A^3 and A^4 are the standards or supports, and F' the top plate.

G is a shaft, which is journaled on the bottom plate A^2 and extends vertically up through the intermediate plate B' and the top plate F', and revolves, as will be presently explained. Upon this shaft G, between the bottom plate A^2 and plate B', is mounted a cog-wheel C, which cog-wheel is provided with a ratchet-wheel C', which is preferably integral with the cog-wheel C. Upon the shaft G, and rigidly secured to the same, is an arm X, to which is attached or fastened a pawl C^2, which engages the teeth of the ratchet-wheel C'.

Above the plate B', upon the shaft G, I provide two or more cog-wheels having connected therewith a motor-spring, a wheel, and trip mechanism. I will now describe one of the same in detail.

g is a collar rigidly secured to the shaft G, revolving therewith, having thereon a spring-pawl *g'*, which contacts with a ratchet *a* on spring-wheel A. The wheel A is provided with a collar C^6. The said collar on its bearings with the shaft is provided with the anti-friction rollers a^2 a^2. Upon the wheel A, I place a motor-spring A^5, which at one end is connected to the side frame A^4 and at the other to the hub of the wheel A. Upon spring-wheel A, near its outer edge, I place a trip *d*, which contacts with the pin-wheel mechanism, as presently explained. Below this spring-wheel A, I mount in a similar manner a like spring-wheel B, which has the same kind of collar, spring, ratchet, and pawl as described in reference to the wheel A. Extending vertically from the intermediate plate B' to the top plate F' is a standard A^6. Upon this standard is journaled so as to revolve one or more pin-wheels D, corresponding to the number of the motor spring-wheels. These wheels D are provided with a series of teeth or pins d^2, and one d^3 longer than the others, the pins corresponding to the number of the revolutions of the spring-wheel, the pin d^3 being struck after the spring-wheel has spent its force, thereby releasing the other spring-wheel and allowing it to work, so as to continue the revolution of the shaft G, the spring-wheel not in revolution having been held at rest by means of the dog E, having lock *e*, which is hung on the upright a^6, the lock *e* engaging in teeth on the spring-wheel.

To prevent any irregular motion of the pin-wheel D, I provide a light spring I, which has one end loose contacting or which engages

with the wheel D, and having its other end rigidly secured to the standard a^6, as shown in Fig. 3 of the drawings.

As will be seen from the drawings, I have shown two spring-wheels—B the lower and A the upper—but any number may be used and having the same connections, and between which pair is placed the trip-dog E and lock *e*, connected and engaging with the pin-wheel D. This construction enables me to place as many springs as I desire upon the shaft G, and the number of revolutions for winding any number of springs will be the same as required for winding one spring; and it will be readily seen that I have the strain of only one spring upon the train of gear, thus enabling me to make the gears of lighter material and cheaper. The anti-friction rollers or balls b^6 b^6 are placed in the hub of spring-wheel to relieve or take away friction on shaft G of all spring-wheels at rest while the shaft G is revolving.

When ready to operate the device, I wind up all the springs and operate them and their wheels alternately. When one is running, the others are held at rest by means of the dog E and lock *e*, and when one spring is run down by means of the contact with the pin-wheel D the other is released and it operates, thereby continuing the revolution of the shaft.

H is a revolving shaft, preferably outside of the standard A^3, which at the bottom is journaled in a suitable boxing provided with anti-friction rollers. This box or cup *k* has a circular groove d^4 d^4 at the bottom, as shown in bottom plate A^2 in Fig. 1 of the drawings, in which groove I place, preferably, one ball, upon which ball the standard H rests, and the ball travels around the circle with the rotation of the standard. At a suitable distance from the bottom of this cup, and also on the plate F, I provide suitable anti-friction bearings e^5 e^5, as shown, to lessen the lateral friction of shaft H. On the bottom plate A^2, and passing through an auxiliary plate or bracket F, which is secured to and projects from the top of the standard A^3, (or it may be the top plate F′ extended, the said plate F being provided with a boxing and suitable anti-friction rollers toward its lower end,) the shaft H has mounted thereon a cog-wheel *h*, which receives its power from the gear-wheel C through one or more intermediate gears *h*′, which are journaled between the intermediate plates B′ and bottom plate A^2, through which the shaft H is revolved by the revolution of the shaft G. The shaft H extends above the top plate F′, and is provided with a shelf or other suitable stand or connection F^2, upon which goods may be displayed and revolved.

I do not wish to confine myself to any specific number of springs or wheels, to any specific number of pin-wheels, or the specific arrangement and location of the various parts, as all of these may be arranged suited to the circumstances, as required. It is also evident that the pins on wheel D may be placed on the face or rim, as desired.

The manner of operation is as follows: All the parts being in proper position and the goods to be displayed having been placed on the shelf, and the springs having been wound up by turning the shaft G, and the shaft being held locked ready for use by any suitable locking device, when ready for use the wound shaft is unlocked or loosened, when the lower spring-wheel B will, by force of the wound spring, commence to revolve, and, through pawl-and-ratchet connection, carry around or revolve the shaft G. This will revolve the wheel C, and, through the intermediate gear and the wheel *h*, revolve the standard H, thereby revolving the goods on its shelf F^2. While the spring-wheel B is revolving and expending its force, the pin *d* is contacting at intervals with the pins d^2 on the wheel D until the wheel D is turned so that the pin d^3 will strike the trip E at the time the spring B has been unwound, which trip E, by being struck, will release the dog or lock *e*, which has been holding the spring-wheel A at rest or locked, when its spring will begin to operate, turning its wheel, and thereby revolving the shaft G and keeping the device continuously in operation.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spring-motor, the combination of the shaft G, wheels A and B, mounted on said shaft and having springs A^5, the springs being adapted to be wound all at one time by the turning of the shaft G, the wheel D, having projections d^2 and d^3, the trip E, and lock *e*, whereby each spring may be unwound alternately, substantially as shown and described, and for the purpose set forth.

2. In a spring-motor, the combination of a revoluble shaft having mounted thereon a plurality of springs, and having the wheels A and B, the pin-wheel D, having projections d^2 and d^3, the trip E and lock *e*, located between the springs, a gear-wheel on the shaft, and a revolving shaft having a shelf for displaying goods and provided with a gear operated through intermediate gears by the gear on the spring-shaft, substantially as shown and described.

3. In a spring-motor, the combination of the pin-wheel D, having projections d^2 and d^3, the trip E and lock *e*, the wheels A and B, and spring I, substantially as shown and described.

4. In a spring-motor, the combination, with the revoluble shaft G, journaled in the frame A′, of the springs A^5, connected at one end to the frame, the wheels A and B, provided with the collar *g*, pawl *g*′, and the ratchet *a*, and friction-bearings a^2 a^2, and the gear-wheel C, substantially as shown and described, and for the purpose set forth.

5. In a spring-motor, the combination of the gear-wheel C, having the ratchet-wheel C′ and

pawl C^2, with the revoluble shaft G, adapted through intermediate gearing to revolve shaft H, substantially as shown and described.

6. In a spring-motor, the revoluble shaft H, journaled at top and bottom in the frame A′ in boxes having anti-friction bearings, the lower end of the shaft resting on a ball in a groove at the bottom of cup or box *k*, whereby the ball travels in a circle with the revolution of shaft H, in combination, through intermediate gears, with a revoluble shaft having a plurality of operating-springs, whereby the shaft H may be revolved continuously, substantially as shown and described, and for the purpose set forth.

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

HENRY WESTPHAL.

Witnesses:
CHAS. C. TILLMAN,
H. HARRISON.