(No Model.)

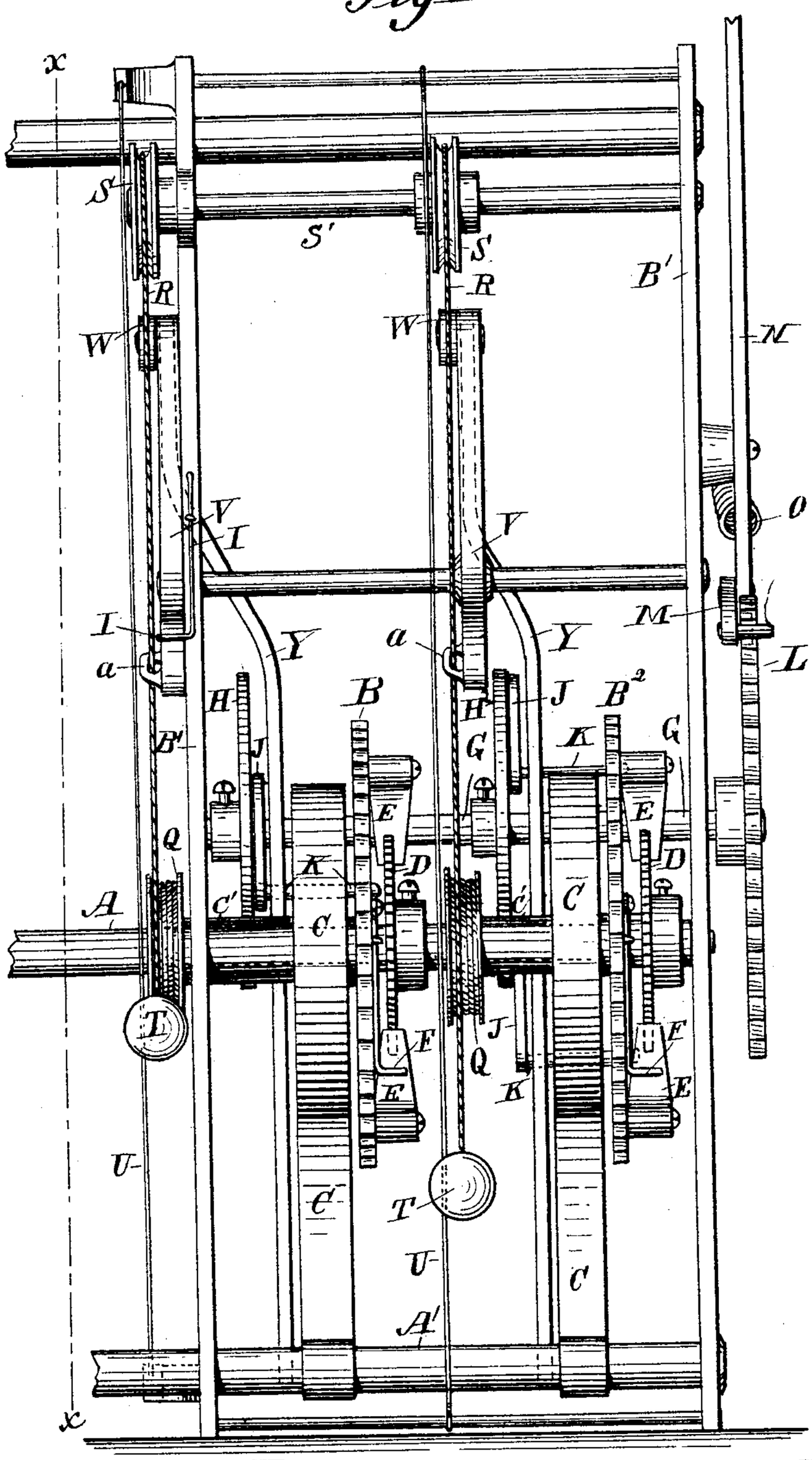
2 Sheets—Sheet 1.

A. CUPIT.

CLOCK WINDING DEVICE.

No. 273,471. Patented Mar. 6, 1883.

Fig 1



WITNESSES:

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C. Sedgwick

INVENTOR:

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BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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CLOCK WINDING DEVICE.

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Fig 3

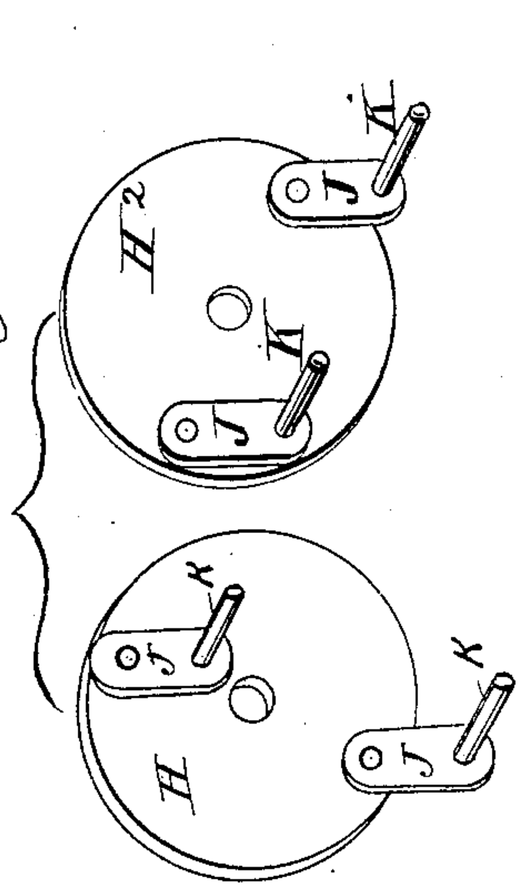


Fig 4

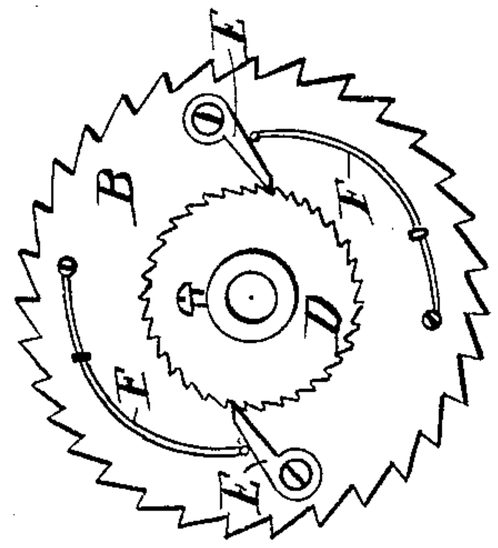
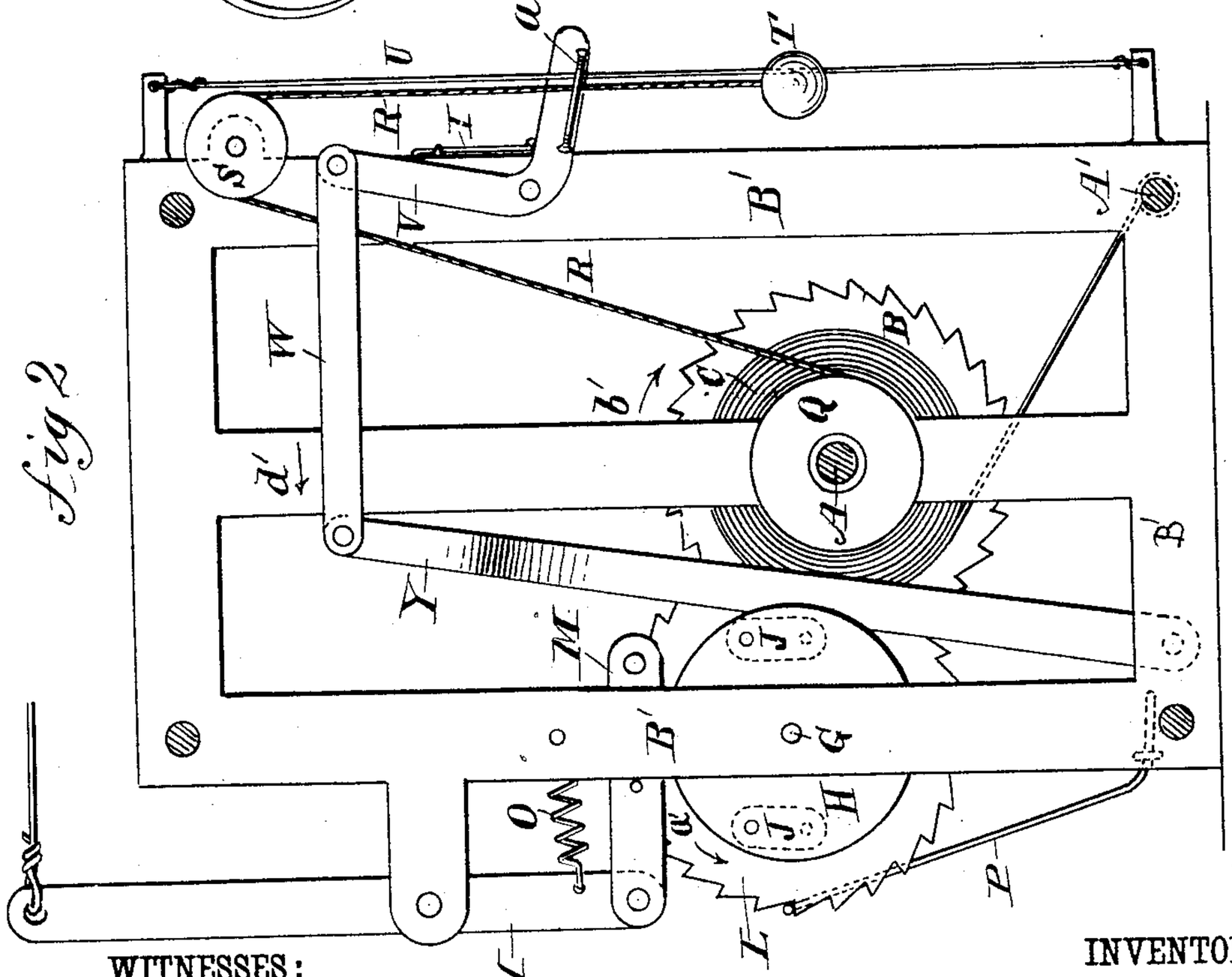


Fig 2



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UNITED STATES PATENT OFFICE.

ALFRED CUPIT, OF PHILADELPHIA, PENNSYLVANIA.

CLOCK-WINDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 273,471, dated March 6, 1883.

Application filed August 30, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALFRED CUPIT, of Germantown, Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and Improved Device for Winding Clocks, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved device for winding clocks in such a manner that the springs will at all times have their full tension, and will always act on the works uniformly, thereby causing a regular and uniform movement of the clock-works, and at the same time not requiring the clock to be wound at certain intervals, as clocks must be wound at present.

The invention consists in a mechanism for winding a clock continuously, which mechanism is operated by a lever which is connected with a door or some other object which is moved frequently.

The invention further consists in the combination, with the spring-arbor, of two springs which are wound alternately, and thus maintain a continuous uniform strain on the works.

The invention further consists in devices for preventing overwinding of the springs, which devices are operated automatically at the proper time.

The invention also consists in the combination of parts, as will be more fully described hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved device for winding clocks. Fig. 2 is a rear elevation of the same. Fig. 3 is a detail perspective view of the wheels, with the hanging pawls of one wheel arranged at a distance of ninety degrees from the hanging pawls of the other; and Fig. 4 is a detail view of two combined ratchet-wheels.

The shaft or arbor A, on which the spring of the clock acts, projects from the rear of the clock-casing, and on the said shaft two ratchet-wheels, B B^2, are loosely mounted, with which wheels the inner ends of two spiral clock-springs, C, are connected, the said springs being coiled around the shaft A, and having their outer ends attached to cross-bar A′ of the frame B′, or to some other part of the said frame. Adjoining each ratchet-wheel B a smaller ratchet-wheel, D, is rigidly mounted on the shaft A, and pawls E, pivoted to the sides of the ratchet-wheels B, are pressed on the teeth of the wheels D by springs F, fastened to the sides of the wheels B. On a shaft, G, wheels H H^2 are rigidly mounted, and to the sides of the said wheels H H^2 pawls J are pivoted, which are provided at their free ends with laterally-projecting pins or studs K, which are adapted to catch on the teeth of the ratchet-wheels B B^2 alternately. The hanging pawls J on the wheels H H^2 are arranged at an angle of ninety degrees from each other, so that while the wheel H, with its pawls J and studs K, is operating on the wheel B, the wheel H^2, with its pawls and studs, is not operating on the wheel B^2, and vice versa, so that as one spring is being wound or coiled, by mechanism hereinafter described, the other is being uncoiled or runs the clock.

On the outer end of the shaft G a ratchet-wheel, L, is rigidly mounted, and with the tooth of the same a pawl, M, engages, which is pivoted to the lower end of a pivoted lever, N, the upper end of which is connected with a door or with any other object that is frequently moved—for instance, a loose vertically-movable step, a water-wheel, a rocking-chair, an engine-wheel, a wind-wheel, &c. The lower end of the lever N is drawn toward the wheel L on the frame B′ by a spring, O. A detent, P, prevents reverse movement of the ratchet-wheel L. By this construction the springs C are coiled alternately, for when the pawls and studs K of one wheel, H, operate on one wheel, B, of one spring C, the pawls and studs of the other wheel, H^2, will not act on the other ratchet-wheel, B^2, of the other spring C, which can uncoil and operate the clock mechanism. After the lever N has been operated a few times the spring connected with the ratchet-wheel B will be coiled, and the pawls and studs on the wheel H will cease to act on the wheel B, which then begins to uncoil to operate the clock mechanism, and at the same time the pawls and studs on the wheel H^2 operate on the ratchet-wheel B^2 to wind up its spring.

On the shaft A two grooved pulleys, Q, are loosely mounted and connected by sleeves C′ with each ratchet-wheel B B^2. Cords R, at-

tached to the said pulleys, pass over grooved pulleys S on the shaft S′, journaled in the frame B′, and have weights or blocks T or loops fastened on the free ends. A vertical wire or guide-rod, U, held on the frame B′, passes through each weight T. One end of the angle-levers V, pivoted to the frame B′, rests against each wire U, which end is provided with a loop, *a*, through which the cord R and the said wire pass. The angle-levers V are pivoted at their angles to the frame B′, and their upper ends are connected by rods W with the upper swinging ends of rods or bars Y, having their lower ends pivoted to the bottom of the frame B′.

The operation is as follows: Every time the lever N is worked the pawl M rotates the wheel L the distance of from one to three teeth in the direction of the arrow *a′*, and rotates the wheels H H² on the same shaft, G, with the wheel L likewise. When the pawls J move upward they catch on the teeth of one of the wheels, B, and rotate them the distance of from one to three teeth in the direction of the arrow *b′*. As there are two pawls on each wheel H H², a wheel, B, will be moved the distance of from two to six teeth for every revolution of a wheel, H. Thereby the spring C, connected with the wheel B, will be coiled. When the latter spring C uncoils, it turns the wheel B in the inverse direction of the arrow *b′*, and the pawls E turn the ratchet-wheels D, rigidly mounted on the shaft A, in the inverse direction of the arrow *b′*. When one spring C uncoils and acts on the shaft A, the other is being coiled in the manner described, and thus one spring will always act on the shaft A, and the clock-works will operate and move uniformly and regularly, and need not be wound, as ordinary clocks are. If, for instance, the lever N is connected with a door that is frequently opened, the clock will be partially wound each time the door is opened, and two springs must be employed to insure the regular movement of the clock-work, as it would be impossible to produce a regular movement of the clock-work if only one spring were provided, as the said spring could not act on the clock at the same time that it is being coiled. To prevent overwinding of the springs, I have provided the levers V, which are worked indirectly by the weights T. As a spring is coiled the corresponding cord, R, is wound on the corresponding drum or pulley, Q, and the weight T is raised. At a certain height the weight T strikes the lower end of the angle-lever V and raises the same, thereby moving the upper end of the same and of the lever Y in the direction of the arrow *d′*. The said lever Y will project beyond the toothed edge of the wheel B and prevents the studs K from catching on the teeth of the wheel B as the studs slide over the same on the smooth edge of the lever Y. When the spring uncoils, the cord R is unwound, the weight T descends and releases the lower end of the lever Y, and suitable springs, I, press the lower end of the lever V downward, thereby moving the upper end of the lever Y in the inverse direction of the arrow *d′*, and thus withdrawing its edge within the edge of the ratchet-wheel B, and permitting the studs K to catch on the teeth of the wheel B again. It will be seen that the springs are arranged to act upon the ratchet-wheels B, and not upon the shaft A, as in the ordinary arrangement of clocks.

Instead of the spiral clock-springs hereinbefore named, I may use cords and weights, which will answer the same purpose.

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

1. The combination, in a clock, of two independent motive powers adapted to be wound alternately by the movement of some object, and operating alternately to run the clock, substantially as herein shown and described, so that as one is being wound the other operates the clock mechanism, as specified.

2. The combination, with a clock, of two springs on the spring-arbor of the same, and mechanism, substantially as described, for winding the said springs continuously alternately, substantially as herein shown and described, and for the purpose set forth.

3. The combination, in a clock, of two springs on the arbor, operating two ratchet-wheels, loosely mounted thereon, two ratchet-wheels rigidly mounted on the arbor and connected by pawls with the spring ratchet-wheels, and devices for winding the springs alternately, substantially as described.

4. The combination, with a clock, of two springs, ratchet-wheels loosely mounted on the arbor and connected with the said springs, ratchet-wheels fixed on the arbor and operated by pawls on the loose ratchet-wheels, and wheels provided with pivoted pawls having lateral studs which catch on the teeth of the loose ratchet-wheels, substantially as herein shown and described, and for the purpose set forth.

5. The combination, with the spring-arbor A, of the ratchet-wheels B, B², and D, the pawls E, the springs F, the springs C, the wheels H H², provided with hanging pawls J, having lateral studs K, the ratchet-wheel L on the same shaft with the wheels H H², and the cam-lever N, connected with a door or some other object which is frequently moved, substantially as herein shown and described, and for the purpose set forth.

6. The combination, with a clock, of mechanism for continuously and alternately winding the springs, and of devices, substantially as specified, for preventing the springs from being overwound, substantially as herein shown and described, and for the purpose set forth.

7. The combination, with a clock, of mechanism for continuously and alternately winding the springs, and of automatically-operated levers which prevent overwinding of the springs, substantially as herein shown and described, and for the purpose set forth.

8. The combination, with the spring-arbor A, of the ratchet-wheels B and D, the springs C, the wheels H, provided with hanging pawls J, having lateral studs K, and of the levers Y,

which are operated automatically and prevent the studs K from catching on the teeth of the wheels B after the springs have been coiled to a certain extent, substantially as herein shown and described, and for the purpose set forth.

9. The combination, with the spring-arbor A, of the ratchet-wheels B D, the springs C, the wheels H, provided with pawls J, having studs K, the levers Y, the cords R, attached to drums Q, connected with the wheels, and devices for moving the levers Y by means of the cords when a certain length of the cords has been wound upon the drums, substantially as herein shown and described, and for the purpose set forth.

10. The combination, with the spring-arbor A, of the ratchet-wheels B D, the springs C, the wheels H, provided with pawls J, having studs K, the levers Y, the cords R, the weights T, the drum Q, the connecting-rods W, and the angle-levers V, substantially as herein shown and described, and for the purpose set forth.

11. The combination, with the spring-arbor A, of the ratchet-wheels B D, the springs C, the wheels H, provided with pawls J, having studs K, the levers Y, the cords R, the weights T, the drums Q, the connecting-rods W, the angle-levers V, and the guide-wires U, substantially as herein shown and described, and for the purpose set forth.

ALFRED CUPIT.

Witnesses:

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GEORGE HARRISON.