(No Model.)

M. SCHWALBACH.

CLOCK ESCAPEMENT.

No. 421,622. Patented Feb. 18, 1890.

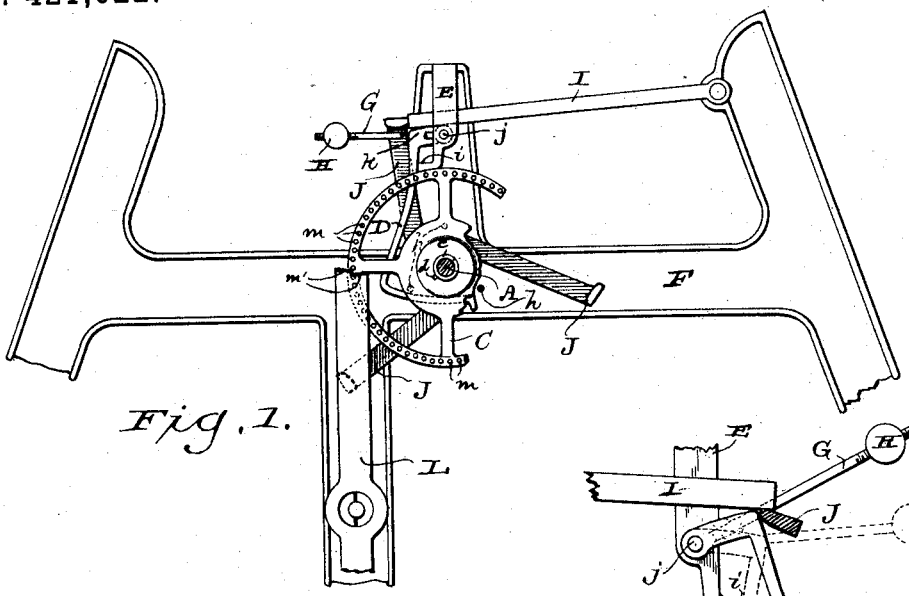

Fig. 1.

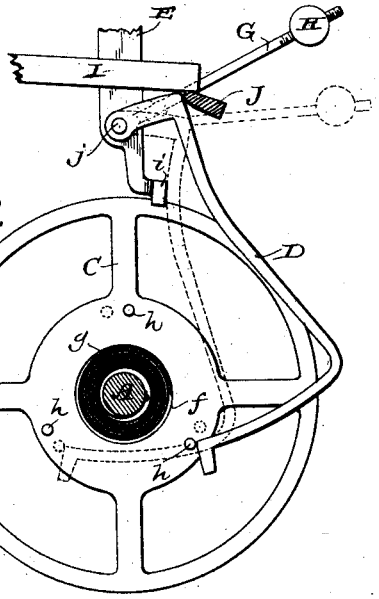

Fig. 2.

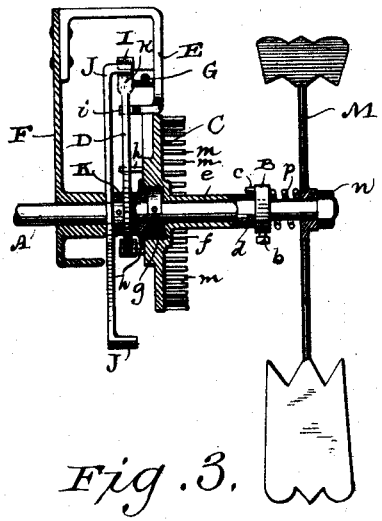

Fig. 3.

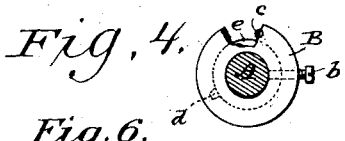

Fig. 4.

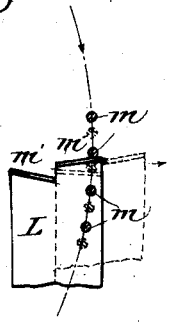

Fig. 5.

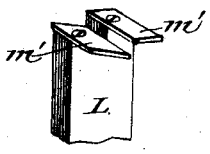

Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

MATHIAS SCHWALBACH, OF MILWAUKEE, WISCONSIN.

CLOCK-ESCAPEMENT.

SPECIFICATION forming part of Letters Patent No. 421,622, dated February 18, 1890.

Application filed February 26, 1889. Serial No. 301,195. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS SCHWALBACH, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Clock-Escapements; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to clock-escapements, being an improvement on the device set forth in my patent No. 232,073, dated September 7, 1880; and it consists in certain peculiarities of construction and combination of parts, to be hereinafter described with reference to the accompanying drawings, and subsequently claimed.

In the drawings, Figure 1 represents a front elevation of my invention with certain of the parts broken away; Fig. 2, a rear elevation of certain of the parts; Fig. 3, a side elevation partly in section; and Fig. 4, a detail view of a stop-collar adjustably arranged on the escapement-shaft of the clock. Fig. 5 is a diagram view illustrating the action of the scape-wheel and pendulum, and Fig. 6 a detail perspective view of the upper end of the pendulum.

Referring by letter to the drawings, A represents the escapement-shaft of a clock; B, a collar adjustably secured thereon by means of a set-screw *b*, and provided with a stop-pin *c*, arranged in the path of a similar pin *d* on a sleeve *e*, that is loose on said shaft and forms the hub of a scape-wheel C. The central portion of the scape-wheel is recessed, as best shown at *f*, Fig. 3, and arranged within this recess is a coil-spring *g*, having its inner and outer ends, respectively, secured to the escapement-shaft and said scape-wheel.

Projecting from the inner face of the scape-wheel are three pins *h*, arranged on a circle at equal distances apart. These pins impinge alternately against the lower end of an elbow-lever D, pivoted to an angular bracket E on the clock-frame F, this bracket being arranged to have its free end *i* come in the path of said lever and form a stop for the latter.

Rigidly connected to the pivot *j* of the elbow-lever is a rod G, and adjustably arranged on this rod is a weight H, the latter serving to insure the return of said elbow-lever to its normal position after each partial rotation thereof by the pins *h* on the scape-wheel C, as will be hereinafter more fully described.

Pivoted at one end to the clock-frame F is a gravity-arm I, arranged to have its free end normally supported by the curved upper end *k* of the elbow-lever D and come in the path of arms J, that correspond in number to the pins *h* on the scape-wheel and project from a hub K, rigidly connected to the shaft, these arms being at equal distances apart.

The outer face of the scape-wheel C is provided with a series of pins *m*, that successively engage with pallets *m'* on the upper end of the pendulum L, as best illustrated in the diagram view Fig. 5, and loosely fitted to the shaft A is a governor-fan M, this fan being held between a nut *n* and spiral spring *p* on said shaft so as to revolve with the latter. The escapement and governor mechanisms described in the preceding paragraph are the ones preferred; but as there are other well-known mechanisms for the same purpose I do not wish to be understood as limiting myself to the construction set forth in said paragraph. The coil-spring *g* is wound up to the required tension and the collar B set so that its pin *c* will be a certain distance from the pin *d* on the sleeve, and consequently the unwinding of said spring will cease the instant both of said pins come into contact.

Supposing the parts to be in the position shown by full lines, Fig. 1, the operation will be as follows: The power of the spring *g* imparts rotation to the scape-wheel C, and by its oscillation the pendulum L comes in and out of engagement with the pins *m* on said wheel, impulse being given said pendulum by a spring or other suitable means common in the art to which my invention relates. By the movement just described one of the pins *h* on the scape-wheel is brought into impingement against the lower end of the elbow-lever D, whereby the latter is partially rotated on its pivot *j*, and its curved upper end *k*, acting on the gravity-arm I, raises the latter out of contact with the arm J, that up to this time has been in impingement against said gravity-arm. The upper end of the elbow-lever D now becomes a stop for the arm J until the pin *h* on the scape-wheel C passes out of contact with the lower end of said elbow-lever. The instant the pin has cleared the elbow-

lever the latter is swung back to its first position by means of the weighted arm G, and comes into contact with the next succeeding one of the pins *h* on the scape-wheel, and the arm J being cleared a partial rotation of the shaft A takes place to rewind the spring *g*, the power for said shaft being derived from an ordinary weight or mainspring mechanism. (Not shown.) The operation just described having been accomplished, the parts are again in their normal relation, with the exception that a succeeding one of the pins *h* and arms J are respectively in position to oppose the elbow-lever D and gravity-arm I; hence it will be seen that at a certain fractional part of an hour—say thirty seconds—the motive power of the clock will be expended in simply rewinding the coil-spring *g* at intervals of not more than one-third of a revolution of the shaft A, said spring being wound to exactly the same tension previous to each impulse it imparts.

In consequence of the above-described operation the force applied to the scape-wheel is at all times equal and independent of the tension of the main spring or heft of the weight that drives the clock.

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

1. In a clock, an escapement comprising a scape-wheel loose on a revoluble shaft, a coil-spring uniting the scape-wheel and shaft, pins arranged at intervals on a face of said scape-wheel, a pivoted elbow-lever arranged to have its free end in the path of the pins, a pivoted gravity-arm normally rested upon the elbow-lever, and a series of arms corresponding in number to said pins and rigidly connected to said shaft to alternately come in contact with the gravity-arm at predetermined intervals, substantially as set forth.

2. In a clock, an escapement comprising a scape-wheel loose on a revoluble shaft, a coil-spring uniting the scape-wheel and shaft, pins arranged at intervals on a face of said scape-wheel, a pivoted elbow-lever arranged to have its free end in the path of the pins, a weighted rod connected to the elbow-lever, a pivoted gravity-arm normally rested upon said elbow-lever, and a series of arms corresponding in number to said pins and rigidly connected to said shaft to alternately come in contact with the gravity-arm at predetermined intervals, substantially as set forth.

3. In a clock, an escapement comprising a scape-wheel loose on a revoluble shaft, a coil-spring uniting the scape-wheel and shaft, pins arranged at intervals on a face of said scape-wheel, a bracket on the clock-frame terminated in a stop, an elbow-lever pivoted to the bracket and arranged to have its free end in the path of the pins, a pivoted gravity-arm normally rested upon the elbow-lever, and a series of arms corresponding in number to said pins and rigidly connected to said shaft to alternately come in contact with said gravity-arm at predetermined intervals, substantially as set forth.

4. In a clock, the combination, with the pendulum, of a scape-wheel loose on a revoluble shaft and having one face thereof provided with a series of pins for engagement with said pendulum, pins arranged at intervals on the opposite face of the scape-wheel; a coil-spring connecting said scape-wheel and shaft, a pivoted elbow-lever arranged to have its free end in the path of the latter pins, a pivoted gravity-arm normally rested upon the elbow-lever, and a series of arms corresponding in number to said latter pins and rigidly connected to said shaft to alternately come in contact with the gravity-arm at predetermined intervals, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

MATHIAS SCHWALBACH.

Witnesses:
N. E. OLIPHANT,
WILLIAM KLUG.