No. 868,872. PATENTED OCT. 22, 1907.

H. V. KNIGHT.

MOTION WORK FOR CLOCKS AND THE LIKE.

APPLICATION FILED MAY 1, 1905.

Fig. 1.

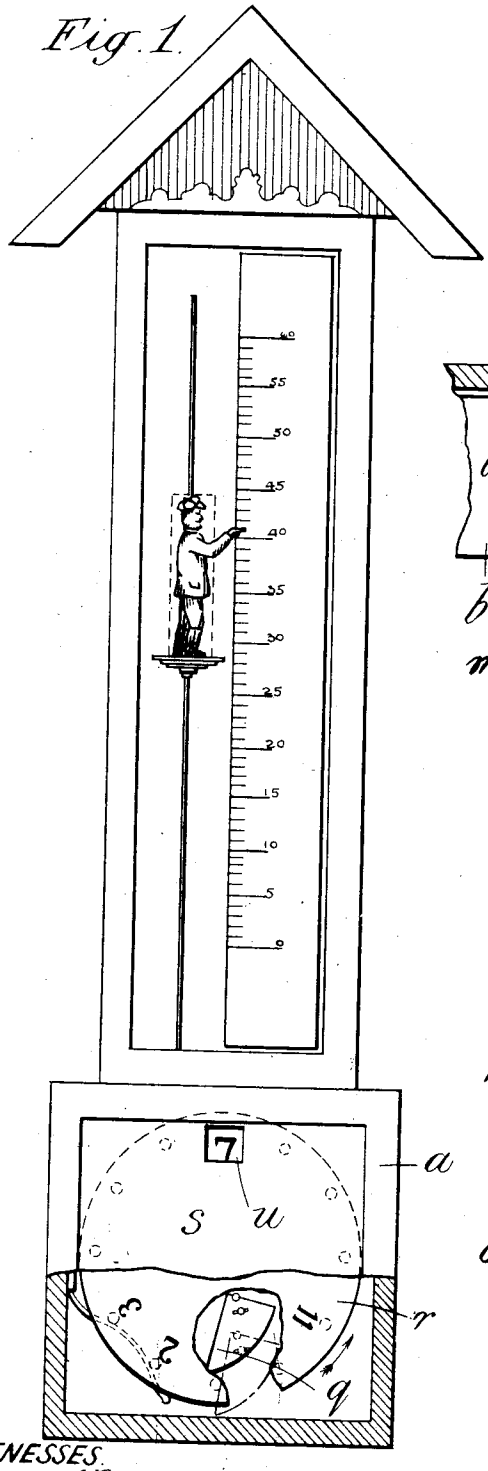


Fig. 2.

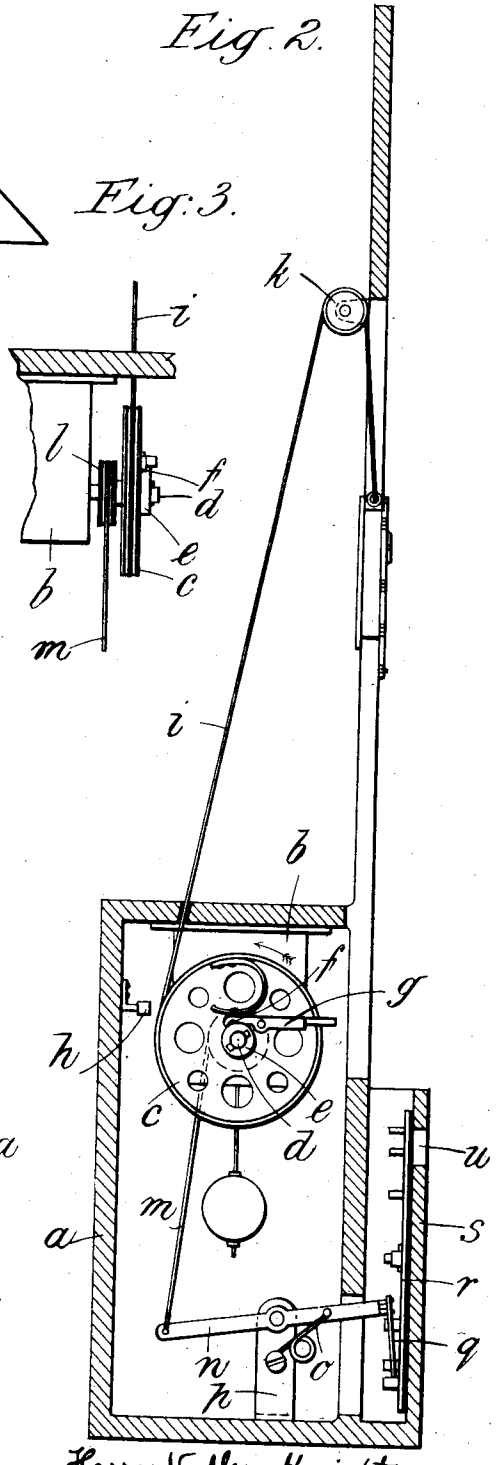


Fig. 3.

WITNESSES.
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MOTION WORK FOR CLOCKS AND THE LIKE.

No. 868,872. Specification of Letters Patent. Patented Oct. 22, 1907.

Application filed May 1, 1905. Serial No. 258,371.

To all whom it may concern:

Be it known that HARRY VIDLER KNIGHT, a subject of the King of Great Britain and Ireland, residing at The Hawthorns, Mitcheldean, in the county of Gloucester, England, has invented certain new and useful Improvements in Motion-Work for Clocks and the Like; and he does hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a clock in which the minutes are marked on a vertical scale and the time indicated by a figure or pointer moving parallel thereto, while the hours are indicated by a dial mounted to rotate behind an opening in the casing, and consists in mechanism actuated by the motion work of the clock for traversing the moving figure or pointer along the scale, and mechanism operated by the return of the figure or pointer at the end of each hour to the starting position to move the hour disk to the extent of one division.

According to this invention the arbor of a center pinion running in the great wheel of a clock train in addition to the train-wheels is extended through the back plate of the clock frame. A free tambourine-shaped drum or a grooved wheel works on this arbor next to the frame plate, motion being given to this drum or wheel by a detent fixed on the end of the same arbor engaging a pin or stop inside the drum, or the detent may be mounted on the drum and the pin or stop on the arbor. On the outside of the drum or wheel one end of a tape or cord is fixed, and as the drum is moved by the aforesaid detent, the tape or cord is wound around the drum or wheel. The other end of the tape or cord passes over a roller and supports a weighted pointer or figure which is raised up the face of a scale as the drum moves round. On the drum or wheel completing its circle every hour a lifting pin or arm placed outside the circle of the drum in the path of the outer end of the detent lifts up the end of the detent engaging the stop inside the drum allowing the weight or figure to descend and pull the free drum back to its starting point. The detent on being released by the lifting pin, again catches the stop inside the drum and the weight or figure starts on its upward course again. A straight upright scale equal in length to the circumference of the drum or wheel is divided into sixty minutes, and the position of the figure at any given time marks the portion of an hour traversed by the figure. On the index finger of the figure reaching 60 on the scale, the figure slides to the bottom of the scale, its weight moving a lever which moves a disk indicating the hour just completed. Alternatively this disk might be moved by the center pinion in the train of wheels. The pendulum is fixed to swing in front of the movement.

In the accompanying sheet of illustrative drawings:— Figure 1 is a front elevation, partly in section, of a clock constructed according to this invention; Fig. 2 is a longitudinal section of the same; and Fig. 3 is a detail view.

The clock-work *b* is arranged in a suitable casing *a*. The arbor *d* carries a loosely mounted wheel *c* which is coupled to the arbor by a wheel or boss *e* fixed thereon and provided with a tooth or stop *f*, and a detent lever *g* pivoted on the disk and held by a spring in engagement with the stop *f*. An arm *h*, preferably covered with india-rubber, is fixed on the side of the casing *a* so as to project into the path of the free end of the lever *g*. On the wheel *c* a cord *i* is wound which runs over a pulley *k* and carries the figure or pointer on its free end. The figure or pointer runs in a longitudinal slot formed in the extension of the side of the casing *a* to which also the pulley *k* is fixed. The hand of the figure points to the scale which adjoins the slot. The length of the scale corresponds to the circumference of the wheel *c* and the divisions of the scale correspond to the number of minutes in an hour. Fast with the wheel *c* is a smaller wheel *l* which is connected by a cord *m* with the one end of a lever *n*, fulcrumed in a block *p* and carrying at its other end a pawl *q*. The end of the lever carrying the pawl tends under the influence of a spring *o* to move out of engagement with the hour disk *r* and is gradually raised as the moving figure or minute pointer ascends, but depressed against the action of the spring by the descent of the moving figure, causing the disk to move through one-twelfth of a revolution. For this purpose the disk is provided with twelve laterally projecting pins and mounted to rotate on an extension *s* arranged in front of the end of the casing *a*. The edge of the disk *r* is furnished with numbers from 1 to 12 at equal distances apart, intended to indicate the different hours, and which appear in succession through the opening *u* in the case.

When the drum or wheel *c* is rotated by the clock-work *b* the cord *i* is wound on the drum or wheel and the figure acting as a pointer, is thereby gradually raised. When the figure has reached its highest position the lever *g* comes against the arm *h* which moves lever *g* out of engagement with the stop *f* thus freeing the wheel *c*. The figure now drops by gravity and rotates the wheel *c* backwards to such an extent that the lever *g* after a complete revolution of the wheel *c* again effects a coupling with the arbor. The cord *m* is simultaneously wound on the wheel *l* causing the pawl to rotate the disk *r* to the extent of one-twelfth.

The pawl *q* is in the form of a triangle, one side of which is curved. It oscillates around a pin at the end

of the lever arm *n* and another pin working in a slot in the push piece acts as a stop.

What he claims and desires to secure by Letters Patent is:—

1. The improved clock, consisting of a vertical scale graduated to indicate the minutes, a pointer adapted to be traversed over the scale, a drum or wheel loosely mounted on an arbor driven by a clock train so as to rotate through a single revolution per hour, means for coupling the drum or wheel to the arbor and automatically releasing it at the completion of each revolution, a cord passing over pulleys and connecting the drum or wheel with the pointer in such manner that it is traversed by the drum from one end of the scale to the other; returning to the starting point under the influence of gravity when the drum is released; and means for indicating the hours.

2. The improved clock, consisting of a vertical scale graduated to indicate the minutes, a pointer adapted to be traversed over the scale; a drum or wheel loosely mounted on an arbor driven so as to rotate through a single revolution per hour, means for coupling the drum or wheel to the arbor and automatically releasing it at the completion of each revolution, a cord passing over pulleys and connecting the drum or wheel with the pointer in such manner that it is traversed by the drum from one end of the scale to the other, returning to the starting point under the influence of gravity when the drum is released, a disk or rotary dial for indicating the hours, and means for actuating the hour disk through one twelfth of a revolution at each return movement of the minute pointer, substantially as described.

3. In a clock as described, the combination with the drum or wheel and pointer of means for actuating the hour disk consisting of a series of pins fixed in the back of the disk, a lever fulcrumed behind the hour disk, a pawl mounted on one end of the lever and coöperating with the pins on the hour disk, a spring connected with the lever and tending to raise the pawl, a cord attached to the other end of the lever and a wheel fixed to the pointer-actuating drum or wheel and arranged to wind up the cord as the pointer descends thereby actuating the pawl and hour disk, the pawl being adapted to lock the disk during a portion of the interval between each hour.

In testimony whereof he has affixed his signature, in presence of two witnesses.

HARRY VIDLER KNIGHT.

Witnesses:
A. G. HARMAN,
A. H. PALIN.