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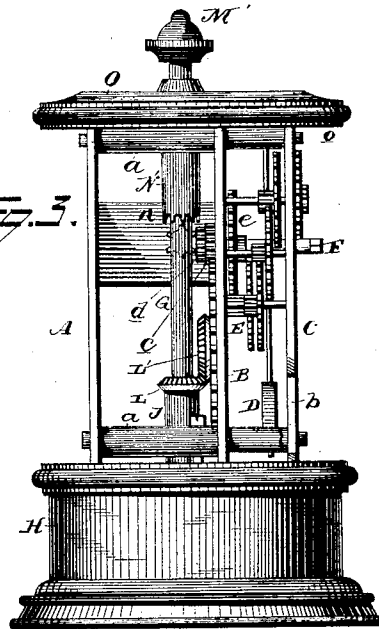
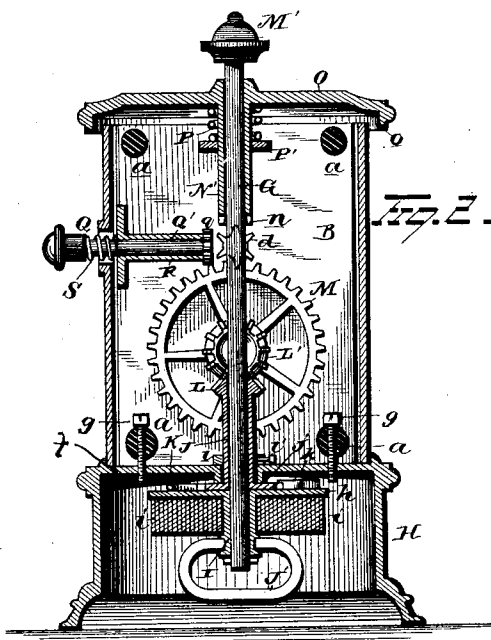
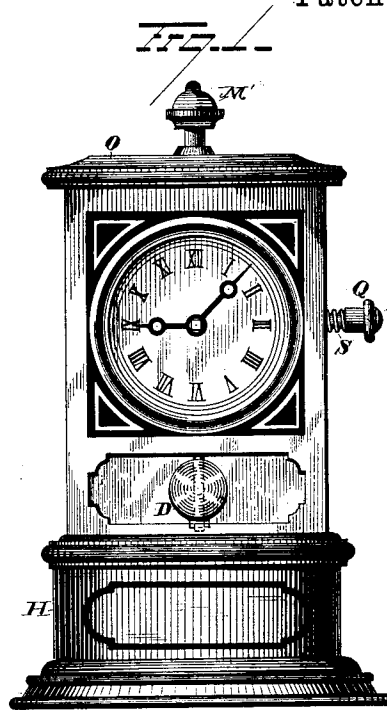
2 Sheets—Sheet 1.

A. E. HOTCHKISS.

CLOCK.

No. 258,421.

Patented May 23, 1882.



WITNESSES

*E. J. Nottingham*  
*Frank C. Brown*

INVENTOR

*A. E. Hotchkiss*  
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 Attorney

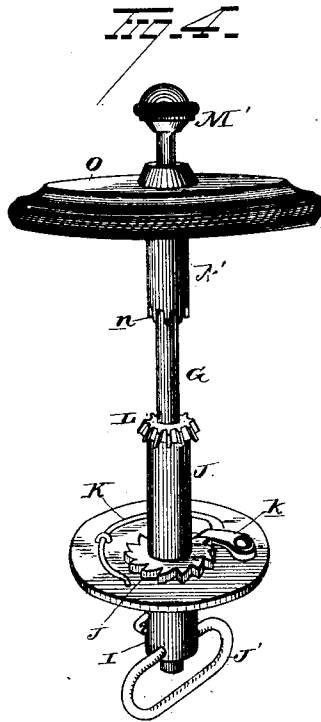
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2 Sheets—Sheet 2.

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*A. J. Nottingham*  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

ARTHUR E. HOTCHKISS, OF CHESHIRE, CONNECTICUT.

## CLOCK.

SPECIFICATION forming part of Letters Patent No. 258,421, dated May 23, 1882.

Application filed December 24, 1881. (Model.)

To all whom it may concern:

Be it known that I, ARTHUR E. HOTCHKISS, of Cheshire, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Clocks; and I do 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 pertains to make and use the same.

My invention relates to an improvement in clocks, the object being to provide a clock of such construction that it will occupy but little space, and yet be provided with sufficient space for the employment of a mainspring of any desired size and power; further, to enable the clock to be wound and set without necessitating the removal from the mantel or other support.

With these ends in view my invention consists, first, in a clock, the combination, with a center shaft, of the mainspring-arbor arranged vertically in the clock, and suitable gearing combining the center shaft and mainspring-arbor.

My invention further consists in the combination, with the center shaft of a clock-movement, of a mainspring-arbor arranged vertically in the clock, and having a mainspring and winding device connected therewith.

My invention further consists in the combination, with the center shaft of a clock, of a mainspring-arbor arranged vertically in the clock, and a device located on the outside of the movement-frame for setting the hands.

My invention further consists in certain other features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, in front elevation, of a clock embodying my invention. Fig. 2 is a view in vertical section. Fig. 3 is a view in side elevation; and Fig. 4 is a detached view of the mainspring-arbor, with its attachments.

A is the back plate, B the middle plate, and C the front plate, of a clock-movement, said three plates being secured together by the pillars *a*, the front plate extending down even with the middle plate and having an elongated opening, *b*, formed therein to disclose to view the pendulum-ball D.

Between the front and middle plates, B C,

is located the train of wheels E, which is driven by the center shaft, F, the latter being arranged horizontally and projecting through the front plate, C, to allow of the attachment of the hands or pointers of the clock, and extending through the middle plate, B, its rear end being provided with two solid pinions, *c d*. Pinion *c* is attached to a sleeve fastened to the center wheel, *e*, the latter being secured to the center shaft by frictional engagement, while the pinion *d* is rigidly secured to the center shaft.

G is the mainspring-arbor, which is arranged vertically between the middle and back plates of the frame. The lower end of the arbor G extends through the top plate, *f*, of the cylindrical spring case or box H, situated at the bottom of the movement, and secured thereto by means of screws *g*, inserted through the lower pillars *a* and the top plate, *f*, or in any other desired manner.

To the lower end of the arbor G is fastened the mainspring-drum I, provided with a disk, *h*. The inner end of the mainspring *i* is secured to the drum I in the usual manner, which consists in securing a pin or stud to the drum and hooking the inner end of the spring thereupon, while the outer end of the spring is fastened to the spring case or cylinder H.

Encircling the mainspring-arbor G is a sleeve, J, the lower end of which has a ratchet-wheel, *j*, attached thereto or formed integral therewith. A pawl, *k*, pivoted to the upper face of the disk *h* of the mainspring-drum, engages with the ratchet, and is retained against displacement by means of the spring K.

To the upper end of the sleeve J is secured or formed therein a bevel-pinion, L, which meshes with a bevel-pinion, L', secured to the first wheel, M, or to its shaft. The first wheel, M, meshes with the pinion *c* and imparts motion thereto, and consequently to the train E. A collar, *l*, is fastened to the sleeve J by a screw, *l'*, to retain the arbor in place. A folding handle, J', is attached to the sleeve J, and is used when desired by winding up the spring.

The upper end of the arbor has a knob or any suitable device, M', attached thereto, whereby the clock may be wound without removing it from its support.

Upon the upper portion of the mainspring-arbor is placed a sleeve, N', to which is secured a disk, O, preferably constructed with a down-

wardly-projecting flange, *o*, though this flange may be dispensed with. The lower end of the sleeve *N'* is provided with teeth, *n*, which engage with the pinion *d* when the sleeve is depressed, and thus by rotating the disk *O* the center shaft may be turned in either direction for setting the clock. The teeth *n* on the lower end of sleeve *N'* are retained out of engagement with the pinion *d* by means of a spiral spring, *P*, interposed between the disk and the bridge-plate, *P'*, the latter being secured to the back and middle plates.

Instead of using the disk *O* for setting the clock, the thumb-piece *Q* at the side of the movement may be employed for this purpose. The thumb-piece *Q* is attached to a shaft, *Q'*, which is supported to a stationary tubular bearing, *R*. The inner end of the shaft *Q'* is provided with a pinion, *q*, which meshes with the pinion *d*, and hence by turning the thumb-piece *Q* the hands of the clock can be turned in either direction. A spiral spring, *S*, serves to throw the pinion *q* out of engagement with the pinion *d*.

From the foregoing it will be observed that the different parts of the clock are in small compass, while sufficient space is provided in the box or casing for the mainspring for the employment of a thirty-hour or eight-day spring.

The clock may be wound by the winding attachment connected with the lower end of the mainspring-arbor, or by the device attached to its upper end. When the latter is used the clock may be wound without being removed from the mantel or other support. The clock may be readily set without opening the case.

Instead of locating the spring at the bottom of the clock, it might be located near the upper end.

It is evident that many slight changes in the construction and relative arrangement of parts might be resorted to without departing from the spirit of my invention, and hence I do not limit myself to the exact construction and arrangement of parts shown and described; but,

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

1. In a clock, the combination, with the center shaft and pinion-shafts of the train arranged horizontally and supported in vertical plates, of the mainspring-arbor arranged vertically in the clock, and a mainspring attached to one end thereof, and suitable gearing connecting the mainspring-arbor and center shaft, substantially as set forth.

2. In a clock, the combination, with the center shaft and pinion-shafts of the train arranged horizontally and supported in vertical plates, of the mainspring-arbor arranged vertically in the clock, a winding device attached to one end of the mainspring-arbor, and a mainspring connected with its opposite end, substantially as set forth.

3. The combination, with the center shaft and pinion-shafts of the train arranged hori-

zontally and supported in vertical plates, of a mainspring-arbor arranged vertically in the clock and connected by gearing with the center shaft, and devices located on the outside of the movement for setting the hands or pointers, substantially as set forth.

4. The combination, with the center shaft of a clock, of a mainspring-arbor arranged vertically in the clock and connected by gearing with the center arbor, and winding devices attached to the opposite ends of the mainspring-arbor, substantially as set forth.

5. The combination, with the center shaft and pinion-shafts of the train arranged horizontally and supported in vertical plates, of the mainspring-arbor arranged vertically in the clock, a sleeve encircling the mainspring-arbor and provided with gearing for imparting motion to the clock-train, and ratchet and pawl for connecting the sleeve with the mainspring, substantially as set forth.

6. The combination, with a pinion attached to the center shaft of a clock, of a sleeve encircling the mainspring-arbor and provided with a pinion adapted to mesh with the pinion on the center shaft, and a disk attached to the sleeve for turning the latter and setting the hands, substantially as set forth.

7. A clock having a rotary top constructed and adapted for setting the hands of the clock, substantially as set forth.

8. The combination, with the center shaft and pinion-shafts of the train arranged horizontally and supported in vertical plates, of the mainspring-arbor arranged vertically in the clock, a mainspring attached to the lower end of said arbor, and a winding device to its upper end, substantially as set forth.

9. The combination, with the center shaft and pinion-shafts of the train arranged horizontally and supported in vertical plates, of the mainspring-arbor arranged vertically, and having winding and setting devices connected with its upper end and located at the top of the clock, substantially as set forth.

10. A clock wherein is employed a train of wheels located between the front and middle plates, and a mainspring-arbor arranged vertically between the middle and back of the frame, substantially as set forth.

11. A clock consisting of the center shaft and pinion-shafts of the train supported in vertical plates, a mainspring located in a separate casing supporting said vertical plates, and a mainspring-arbor arranged vertically, and gearing for transmitting motion to the clock-train, substantially as set forth.

12. A clock having the mainspring-arbor arranged at right angles to the pinion-shafts of the remainder of the train of the movement.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ARTHUR E. HOTCHKISS.

Witnesses:

FRANK C. BOWENS,  
HERMAN MORAN.