H. J. & W. D. DAVIES.

Clock.

No. 202,795. Patented April 23, 1878.

Fig. 1

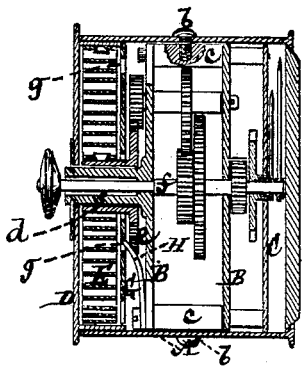


Fig. 2.

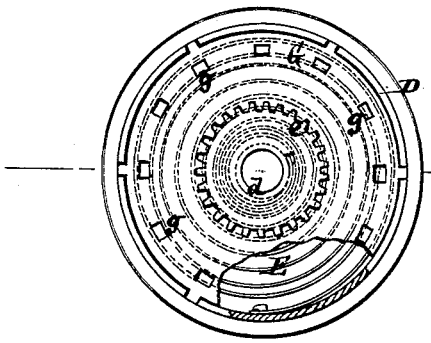
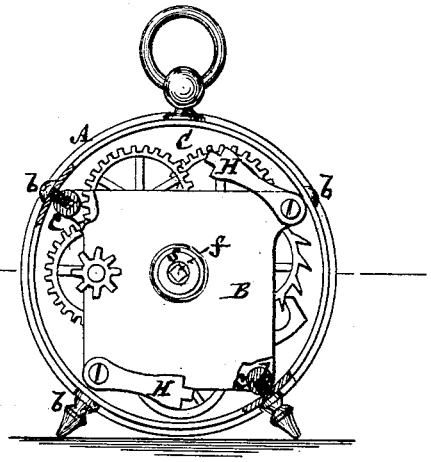


Fig. 3.



Witnesses

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IMPROVEMENT IN CLOCKS.

Specification forming part of Letters Patent No. **202,795**, dated April 23, 1878; application filed March 5, 1878.

To all whom it may concern:

Be it known that we, HENRY J. DAVIES and WALTER D. DAVIES, of the city of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Clocks; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

One of the objects of this invention is to provide for the employment of a long mainspring in a clock or time-piece of contracted exterior dimensions.

To this end, the invention consists in the arrangement of the main wheel of the clock, having attached to it the inner end of the mainspring, concentric with the center or minute-wheel arbor of the clock.

The invention also consists in a loose back or back-piece of the clock-case, having attached to it a ratchet, in combination with the main-wheel arbor, on or around which said back or back-piece is free to rotate when winding up the clock, and one or more clicks to prevent back-action of the mainspring.

The invention furthermore consists in a combination, with the loose back or back-piece, having attached to it the outer end of the mainspring, of the main wheel having a hollow arbor, to which is attached the inner end of the mainspring, and a stationary arbor concentric with said hollow arbor, and forming a bearing for the latter.

Again, the invention consists in a combination of a loose back or back-piece for winding the mainspring, the main wheel having a tubular arbor, and the minute-wheel arbor constructed to extend through the stationary arbor on or around which the main-wheel arbor rotates, to provide for adjustment of the hands from the rear of the clock.

The invention likewise consists in a loose back or back-piece for winding up the mainspring, constructed to form a box for the latter, in combination with the clock-case constructed to receive said back or back-piece within it, and to form a bearing therefor.

The invention also consists in a novel and advantageous combination of means for securing the clock-frame to the clock-case.

In the accompanying drawings, Figure 1 represents a sectional view, mainly in line with the center arbor, of a clock constructed in accordance with our invention. Fig. 2 is an inner end or face view of a loose back of the clock-case, together with the mainspring, a ratchet for holding the latter, and the main wheel of the clock, and showing said back, or back winding-piece of the mainspring, as constructed to form a box for the mainspring; and Fig. 3, a view from the rear of the clock, with said back removed.

A is the clock-case, which may be of cylindrical construction, and B the clock-frame, which, after having been entered within the case, is secured by screws *b*, arranged to pass through the sides of the case A and into the pillars *c* of the clock-frame, intermediately of its front and back, and so caused to secure the clock-frame in a firm, steady, and readily-detachable manner to the clock-case, irrespectively of the back of the clock-case as a means of attachment.

C is the dial, carried by the frame B. D is the back or back-piece of the clock-case A. This back or back-piece is loose, so as to be capable of being revolved without turning the case.

The mainspring E is attached at its outer end to the loose back or back-piece D, to provide for the winding of said spring by the latter, the other or inner end of said spring being connected with the main wheel *e* of the clock—as, for instance, through a tubular arbor, *d*, which is concentric with the back or back-piece D. Said arbor *d*, which has attached to it the inner end of the mainspring E, receives centrally within or through it a stationary arbor, *s*, the axis of which is coincident with the center or minute-wheel arbor *f* of the clock. Thus the main wheel *e*, having attached to it or its arbor the mainspring E, is concentric with the center or minute-wheel arbor *f*. This provides for a long or extended mainspring, E, within a space only circumscribed by the clock-case in a transverse direction relatively to the center arbor, and so that when said spring is unwound it is free to occupy the whole diameter of the clock-case, or thereabout, when said case is of a circular construction.

Attached to the front of the winding or revolving loose back or back-piece D is a ratchet, G, preferably of a flat construction, and which is or may be formed by a plate secured to the inner end or face of the back D. Such attached ratchet consequently turns with and virtually forms part of said back. This flat ratchet G may either have teeth struck up on its face, by indenting it, or have apertures *g* formed in it for one or more clicks, H, attached to the clock-frame, to engage with, for the purpose of holding the mainspring against back movement.

The loose back or back-piece D it is preferred, as here shown, to make hollow or form with an inwardly-projecting rim capable of turning within the rear end of the case A as a bearing, and serving to provide for the attachment to it of the outer end of the mainspring E, as also the ratchet G; but said loose back or back-piece need not necessarily be constructed hollow, and, instead of the outer end of the mainspring E and the ratchet G being secured to a rim on it, they may be attached to studs or projections on the inner face of the loose back or back-piece, or be otherwise suitably attached to the latter. When, however, said back or back-piece is of a hollow form, by striking it up, or otherwise constructing it as here represented, the same forms a box for the mainspring, which is received within it.

From this description it will be seen that not only may a long mainspring be used within a clock-case of contracted exterior dimensions, or, in other words, the whole diameter or cross-sectional dimensions of the case be made available to the reception and working of the mainspring, as hereinbefore described, but that the center of motion, as it were, about or around which the back or back-piece D turns when winding up the clock by rotating said back for the purpose, is coincident with the axis of the center or minute-wheel arbor *f*, and that the main wheel E is also concentric with said arbor. The dial C, too, being concentric with the case or its back D, the same, when inclosed by the case, may be of the same size or diameter, or thereabout, as the interior of the case. By the combination of parts also, as herein described, gearing of a large size or coarse construction may be used in a clock of small dimensions.

The stationary concentric arbor *s* may, if desired, be made tubular, in order that the minute-wheel arbor *f* may be extended through it, to provide for adjustment of the hands from the rear of the clock.

We claim—

1. The main wheel of the clock, having attached to it the inner end of the mainspring, and arranged in concentric relation with the center arbor of the clock, substantially as specified.

2. The loose back or back-piece of the clock-case, having attached to it a ratchet, in combination with the main-wheel arbor, around which, as a center of motion, said back or back-piece is free to rotate when winding up the clock, and one or more clicks to prevent back action of the mainspring, essentially as specified.

3. The combination, with the loose back or back-piece having attached to it the outer end of the mainspring, of the main wheel, with its tubular arbor *d*, having attached to it the inner end of the mainspring, and the stationary concentric arbor *s*, essentially as described.

4. The combination of the loose back or back-piece D, the main wheel, with its tubular arbor *d*, and the center or minute-wheel arbor *f*, constructed to extend through a stationary arbor, around which the main wheel rotates, for adjustment of the hands from the rear of the clock, substantially as specified.

5. The combination of the loose back or back-piece D, constructed to form a box for the mainspring, and the case A, constructed to receive said back or back-piece within it, and to form a bearing therefor, essentially as described.

6. The combination of the case A, the pillars *c*, and the screws *b*, arranged to pass through the sides of said case, and serving to secure the pillars to the case, and clock-frame to the latter intermediately of its front and back, substantially as specified.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

HENRY J. DAVIES.
WALTER D. DAVIES.

Witnesses:
VERNON H. HARRIS,
FRED. HAYNES.