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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CLOCK AND WATCH CALENDARS.

Specification forming part of Letters Patent No. **148,405**, dated March 10, 1874; application filed February 5, 1874.

To all whom it may concern:

Be it known that I, LEVI BERGER, of Danville, in the county of Montour and State of Pennsylvania, have invented a new and Improved Watch and Clock Calendar; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a front view. Fig. 2 is a back view. Figs. 3, 4, and 5 are detail views.

The invention relates to calendar clocks or watches; and consists in the features of improvement hereinafter fully described, and subsequently pointed out in the claims.

A represents a face-plate, having inside post A' and the series of apertures a a^1 a^2 a^3 , through which are respectively seen the day of the week, the day of the month, the month, and the year. About the post A' is loosely placed a plate, B, having seven notches, b , on one side, and the name of a day of the week located on the other side opposite to each notch. This plate is moved forward a space equal to the distance between the two notches during every twenty-four hours by a pawl, c , on the projecting end C' of the lever C, which moves under and is limited by the arc-guide c^1 . This lever has two prongs, c^2 c^3 , which are acted upon successively by the clock-work every twelve hours, having a pawl, c^4 , that prevents the backward movement after the first action, and a retracting-spring. D is a loose ring-plate, having the ratchet-teeth d on inner edge, the thirty-one teeth d^1 on the inside face, and the figures from 1 to 31 on the outside face, the latter being successively exhibited to view through hole a^1 . This plate is connected with the stationary post A' by a coiled spring, E, having at each end a pawl, e , that catches in the ratchet-teeth d , a stud, e^1 , behind each pawl, and a shoulder, e^2 , placed at a suitable distance from either pawl. The ring-plate D has also on its outer edge a spring-catch, d^2 , that fits the twelve notches f^3 of ring-plate F, and moves the latter once a month.

It will be observed that the broad transverse teeth d^1 are all made to extend entirely across the face of ring-plate D, except the twenty-ninth, thirtieth, and thirty-first, which are suc-

cessively lessened more and more in their radial length, for a purpose hereinafter adverted to.

The ring-plate F shows successively the name of the twelve months through hole a^2 of the face-plate, and has upon the inner face a long cam-slot, f , and a short one, f^1 . The ring-plate F has upon its rim a spring-catch, f^2 , which fits into the notches g^2 of the loose year or ring plate G, and moves it forward once annually. The latter plate exhibits each succeeding year through hole a^3 , and has also leap-year concavities g on its inner face—one placed opposite to every fourth notch g^2 . H is a diametrical bar, that is fastened to the central post and the flange of face-plate. To this is attached a spring-detent, h , that fits into notches of plate F, and makes it stationary until the detent is lifted at monthly intervals, while h^1 is another detent, that holds the plate G until this detent is annually lifted. On the bottom of the diametrical plate H are also flanges h^2 h^3 , that hold the carrier-pawls d^3 and f^3 down into the notches of monthly and yearly plates until the latter are moved the required distance. K is a bar placed loosely in the slot h^4 of plate H, held down by the spring I, and provided with the pendent studs k k^1 , one of these studs acting as a detent to the plate D, while the other hangs on a spring-arm in the slot f or f^1 . k^2 is a guide projection on the end, and fitting in a radial recess, a^4 , in the flange of face-plate. This slot f (by its shape) draws the detent-stud k during September, April, June, and November to one side, so that said stud will escape the last tooth d^1 , and return to the unit of notation after thirty days; also, so as to escape in February the three last teeth d^1 . During leap or every fourth year, however, the end of spring-arm, which carries stud k^1 , falls into one of the concavities g , and causes this stud to fall below the shallower slot f , and to enter the slot f^1 . The effect of this is to cause this stud k^1 to leave the outer edge of the twenty-ninth tooth, and escape the thirtieth and thirty-first.

Thus I exhibit the day of the week, the day of the month, the month, and the year by automatic mechanism, without cog or wheel gearing, and in such limited space that it may all be confined in a plate of but little thickness,

the whole being thus made readily applicable either to a watch or clock.

The purpose and working of particular parts having been pointed out in the body of the description, I will state the general mode of operation: Supposing the calendar to be set at January 1, 1874, in twenty-four hours the week-plate B will be moved forward by the pawl *e* one notch, as also the plate D, displaying at the openings *a* *a*¹ "Friday," "2." This will continue until the month is ended, when the month-plate F will be moved one notch by the catch *d*² on plate D, and display "Feb." at hole *a*². At the end of twelve months the catch *f*² will move forward the year-plate G one notch, and display at hole *a*³ "1875."

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

1. The combination of the lever C, having the projection C', the spring E, having pawls *e e* and studs *e*¹ *e*¹, the ring-plate D, having edge teeth *d* and face-teeth *d*¹, and stationary detent-stud *k* on the loose bar K, as and for the purpose set forth.

2. The combination of the stationary detent-pawl *h*, face-plate having hole *a*², and plate F, having twelve notches, *f*³, the monthly revolving plate D, having spring-catch *d*³, and the

coil-spring E, having shoulder *e*², as and for the purpose specified.

3. The combination of a ring-plate, D, having twenty-eight of the teeth *d*¹ going all the way across the face of ring, but the twenty-ninth, thirtieth, and thirty-first becoming successively shorter and shorter, with the radially-adjustable detent-stud *k* of loose bar K, as and for the purpose described.

4. The combination, with spring-held loose bar K, having the studs *k k*¹, of the ring F, having slots *f f*¹, into which the stud *k*¹ works at the times, in the manner, and for the purpose set forth.

5. The guide-stud *k*¹ on a spring-arm of loose bar K, combined with the plate G, having quadrennial concavities *g*, as and for the purpose specified.

6. The combination of lever C, spring E, the four movable plates B D F G, and the face-plate, all connected and operated substantially in the manner described, so as to be readily comprised within a space of small thickness, and without the use of cogs or gear-wheels.

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Witnesses:

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