

W. L. BUNDY.
Calendar-Clock.

No. 222,377.

Patented Dec. 9, 1879.

Fig. 1.

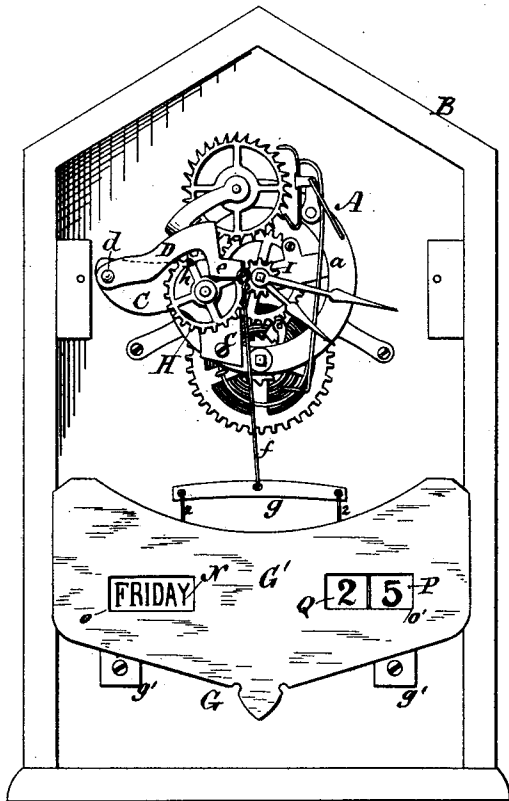


Fig. 2.

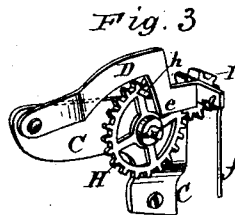
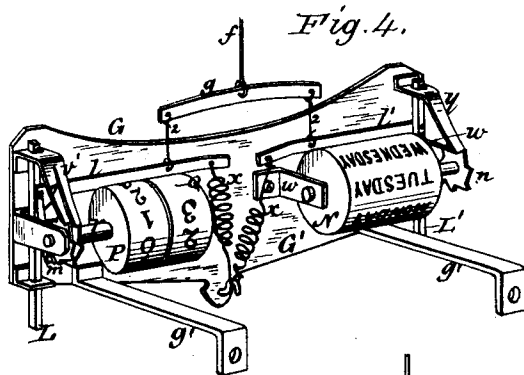
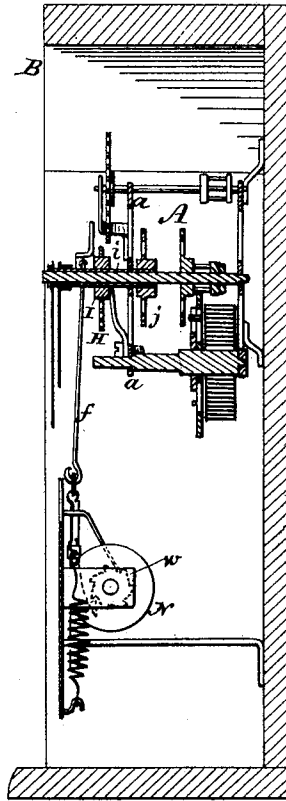
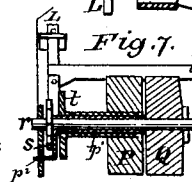
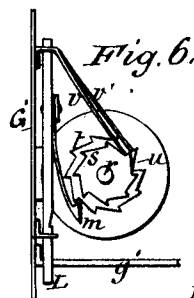
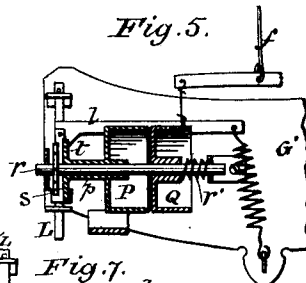


Fig. 5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CALENDAR-CLOCKS.

Specification forming part of Letters Patent No. 222,377, dated December 9, 1879; application filed March 18, 1879.

To all whom it may concern:

Be it known that I, WILLARD L. BUNDY, of Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Calendar-Clocks; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front view of a clock with its dial and case-door removed, and having my improved calendar attachment. Fig. 2 is a vertical section of Fig. 1 through the minute-wheel arbor. Fig. 3 is a detached perspective view of the calendar-operating lever, its supporting-plate, the tripping-wheel, and its engaged pinion. Fig. 4 is a detached rear perspective view of the calendar-movement. Fig. 5 shows a diametric section through the day-of-the-month-indicating cylinders. Fig. 6 shows an end view of the actuating devices of these cylinders. Fig. 7 is a diametric section through day-of-the-month-indicating cylinders, made solid and provided with a separating-sleeve between their respective shafts.

This invention relates to an improved calendar attachment for ordinary clock-movements, its object being to enable the production of calendar-clocks at small cost.

Clocks indicating hours and minutes and the day of the week and month have heretofore been of a complicated character, the mechanism for operating the day and date indicators being integral members of trains of special construction, including also "mean" time movements. It is true that much of the complexity of these clocks has been due to the introduction of devices for making proper changes between months having different numbers of days, and some have been provided with leap-year trips; but all, so far as I am aware, having any claim to reliability, have been so expensive as to preclude their popular use.

By my invention any ordinary clock, at a very small expense, and without altering the train, may be converted into a calendar-clock which will accurately indicate the days of the week and month, in addition to its previous function as a time-keeper, the only care required, in addition to the usual winding, being

that the calendar shall be changed to commence properly at the beginning of each month.

The invention consists in the combination of a pivoted lever mounted on a plate adapted for attachment to the front plate of a clock-frame, a toothed wheel journaled on the same plate with the lever, and having a projection arranged to meet and swing or raise said lever at each revolution of the wheel, a calendar-movement mounted in a frame adapted for attachment within a clock-case, and a suitable link connecting the calendar-trip with the traveling end of the lever, whereby at each revolution of the wheel, when the parts are in position, the lever will be swung on its pivot and the calendar-indicators changed from the indication of one day and date to another.

It consists, further, in the combination of the above-described mechanism with an ordinary clock, having on its hour-wheel sleeve a pinion engaging with the toothed wheel, and having a number of cogs equal to half the number of the teeth of said wheel, the plate supporting which is suitably secured to the clock-frame, while the frame carrying the calendar-indicators is secured to the interior of the clock-case at a proper point for operation when the lever is lifted.

The hour-wheel sleeve making two revolutions in twenty-four hours, its pinion will cause its engaged wheel, having double its number of teeth, to make one complete revolution in the same time, and at intervals therefore of twenty-four hours, or one day, the projection or stud on said wheel will swing or raise one end of the lever, which, through its connecting-link, will operate the indicators of the calendar, tripping or revolving them to indicate one day ahead.

The invention also comprises an improved day and date indicator movement, which will be hereinafter particularly described.

In the accompanying drawings, the letter A indicates a clock-movement of ordinary construction, secured, as usual, in a case, B. To the front plate *a* of this clock is firmly secured by a single screw, a plate, C, to which is pivoted at *d* a lever, D, having its inner portion bent or formed to present a shoulder, *e*, used to raise it, while to its extreme inner end is attached loosely a rod, *f*, the lower end of

which is connected to the middle of a bar, *g*, the opposite ends of which are respectively connected, through suitable intermediate links, with the day-of-the-week and day-of-the-month indicators of the calendar *G*, as will be more particularly described hereinafter.

Upon the plate *C*, below the inner portion of the lever *D*, a toothed wheel, *H*, is journaled, and is provided near its periphery with a stud or pin, *h*, projecting forward. This toothed wheel *H* meshes with a pinion, *I*, which is mounted upon the sleeve *i* surrounding the minute-wheel arbor, and carrying the hour-wheel *j*. The number of cogs on the pinion *I* is equal to half the number of teeth on wheel *H*. Now, as the sleeve *i*, which also carries the hour-hand, makes one revolution in twelve and two in twenty-four hours, the pinion *I* will once every day or twenty-four hours cause the wheel *H* to make a complete revolution, and at every revolution of said wheel the stud or pin *h* will meet or strike the inner portion of the lever *D*, lifting it as the wheel continues to turn until said stud passes the shoulder *e*, when the lever will fall to its normal position. The distance of the stud *h* from the center of the wheel is such that the lever will be moved sufficiently to trip and revolve the calendar.

As the bar *g* is drawn upward by the lifting of the lever, it raises through the links 2 the horizontal arms *l* *l'*, the outer ends of which are rigidly secured to vertical slides *L* *L'* moving in suitable guides, and provided with firmly-attached springs bent outward and terminating in hooks, as shown at *m*, which engage the teeth of ratchet-wheels on the shafts of the indicating-cylinders.

The day-of-the-week indicator is a single cylinder, *N*, fixed on a central journal which has its bearings in arms *w* projecting from the rear surface of the front plate *G'* of the calendar. The end of the shaft near the end of the front plate is provided with a ratchet-wheel, *n*, having seven teeth, and on the surface are inscribed, longitudinally and at equal distances apart, the names of the seven days of the week. In the front plate, *G'*, of the calendar is formed a window or slot, *o*, through which one of these day-names is visible, as Friday, in Fig. 1, and the throw of the lever *D* is so regulated that its upward movement will cause the spring-hook or slide *L'* to move the ratchet-wheel *n* the space of one tooth, which communicates sufficient movement to the cylinder *N* to carry one day-name away from the window *o* and bring another to view. The return of the slide *L'* with its hook to engage another tooth of the ratchet-wheel, is effected by a coiled spring, *x*, one terminal of which is secured to the arm *l'* and the other to the front plate, a spring-pawl, *y*, serving to prevent retrograde movement of the ratchet-wheel and to hold it steady.

The day-of-the-month or enumerating indicator consists of two short cylinders, *P* *Q*, arranged end to end. The cylinder *Q* is fixed

upon a shaft, *r*, mounted in the same manner as the shaft of the week-day cylinder, but at the opposite end of the front plate, and is provided with a ratchet-wheel, *s*, having eight teeth. The cylinder *P* is secured to a central sleeve, *p*, fitted loosely upon the shaft *r*, as shown in Fig. 5, or upon an intermediate stationary sleeve, *p'*, as shown in Fig. 7. In either case this sleeve *p* is provided with a ratchet-wheel, *t*, having ten teeth.

The ratchet-wheels *s* and *t* stand side by side, and the spring-hook *m* of the slide *L* extends across the edges of both, but owing to the greater diameter of the wheel *t*, said hook is held away from the teeth of the wheel *s*, except when it rests in a single notch, *u*, which is sufficiently deeper than all the other notches of wheel *t* to permit the hook *m* to at the same time engage a tooth of each wheel, and when it is moved upward it, of course, moves both cylinders *P* and *Q*.

Spring-pawls *v* *v'* hold and steady the wheels *s* and *t*. On the cylinder *P* is a peripheral series of numerals from 0 to 9 equidistant apart, and on the periphery of cylinder *Q* the numerals 1 2 3 are arranged at the same distance apart as the numerals of the other cylinder; then a blank, followed again by the numerals 1 2 3. The 0 of cylinder *P* coincides in position with the deep notch *u* of wheel *s*. A window, *o'*, in the front plate *G'*, affords a view of the numeral or numerals indicating any particular day of the month.

Now, supposing the calendar on the last day of the month to require to be set by hand to show "Monday" at the window *o* and 1, at the window *o'* the 1 should be on the cylinder *P*, and the cylinder *Q* should present a blank space, its numeral 1 being just out of sight below the edge of the window *o'*.

Now, if the clock is wound up and set in the evening, for example, at ten o'clock, with the stud *h* of the wheel *H* under the shoulder *e* of lever *D*, and holding said lever partly up, in a couple of hours it will have passed said shoulder and have allowed the lever to drop and set the day on the calendar. The indicators will remain so set all next day, first of month, and at twelve o'clock on the following night the lever will again have been raised to its highest position, taking three or four hours to be so raised according to the length of the shoulder *e*, the ratchet-wheels *n* and *t* will be moved one tooth, "Tuesday" appear at window *o*, and the 2 of cylinder *P* at window *o'*.

The complete changes of the calendar will take place in this manner every night at twelve until the name and number of the ninth day are displayed, and when the lever then falls the spring-hook *m* of slide *L* will rest in the deep notch *u* of the ratchet-wheel *t*, and will at the same time engage a tooth of the wheel *s*, so that on the night of the ninth at twelve o'clock both the wheels *s* and *t* will be moved one tooth, and the 1 of cylinder *Q* and the 0 of cylinder *P* will be displayed at the window *o'*, indicating the tenth day of the month. The

units of cylinder P will then be successively displayed in conjunction with the 1 of cylinder Q until the night of the nineteenth day, when the 2 of said cylinder Q will appear in conjunction with the 0 of cylinder P, and so on until the end of the month, when the calendar must be again set by hand to begin the new month.

It will be observed that the changes of the calendar are made positively, and by the power of the mainspring exerted through the clock-train, the springs x x serving only to retract the slides after the change is made. The bar g , being loosely connected with the rod f and arms l l' , serves as an equalizer of the lifting-power, so that should one indicator move less easily than the other no part of the calendar-movement would be strained, as one slide could move in advance of the other, that not affecting the accuracy of the indicator.

A small spring, r' , coiled on shaft r , may be used to abut against one of the supporting-arms of the day-of-the-month cylinders, and exert a yielding pressure upon the hub of cylinder Q to keep the two cylinders together and in proper position with relation to their window o' ; but to prevent the hollow shaft p of the cylinder P (that rotates ten times more than the shaft r) from carrying the shaft r by friction, I prefer placing a stationary sleeve, p' between said shafts, as shown in Fig. 7. This sleeve is retained stationary by an extension, p^2 , entering a perforation in the bearing of the shaft r .

The arms g' attached to the front plate, G' , have screw-holes in their bent ends to receive screws, by which they may be secured to a clock-case, as shown in Fig. 1.

Having now fully described my invention, and explained its construction and operation, I claim—

1. The combination of a pivoted lever mounted on an independent plate adapted for attachment to the front plate of a clock-frame, a toothed wheel journaled on the same independent plate with said lever, and having a projection arranged to strike and swing said

lever at each revolution of the wheel, a calendar-movement having all its indicators on the same horizontal line, the day-of-the-month cylinders placed end to end, and mounted in a frame adapted for attachment within a clock-case, and a suitable link connecting the calendar-trip with the traveling end of said lever, substantially as and for the purpose set forth.

2. The combination, with an ordinary clock having on its hour-wheel sleeve a pinion, I, of the toothed wheel H, mounted on an independent plate, and having a projecting stud or projection, a lever, D, adapted to be tripped by said stud or projection, a calendar-movement having the day-of-the-month cylinders placed end to end and arranged in suitable position, and rod or link connecting said lever with the trip of the calendar-movement, substantially as described.

3. The combination of the front plate, G' , having suitable windows or openings, the cylinders P and Q, mounted on shafts passing one through the other, and carrying ratchet-wheels, the slides moving in suitable guides and provided with devices for turning said ratchet-wheels, and a suitable connection between said slides with a clock mechanism, an independent plate, C, and a rod, f , substantially as described.

4. A calendar-operating attachment for clocks consisting of the independent plate C, lever D, pivoted to said plate, and toothed wheel H, having stud h , and journaled upon said plate in position for engagement with a pinion upon the hour-hand sleeve of a clock-movement, substantially as described.

5. In combination with the cylinder P having a hollow cylindrical shaft, p , and a cylinder, Q, having a central shaft, r , the stationary sleeve p' interposed between the shafts of said cylinders P and Q, substantially as and for the purpose specified.

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