2 Sheets--Sheet 1.

T. H. MOTT.

Calendar-Movement of Clocks.

No. 161,813. Patented April 6, 1875.

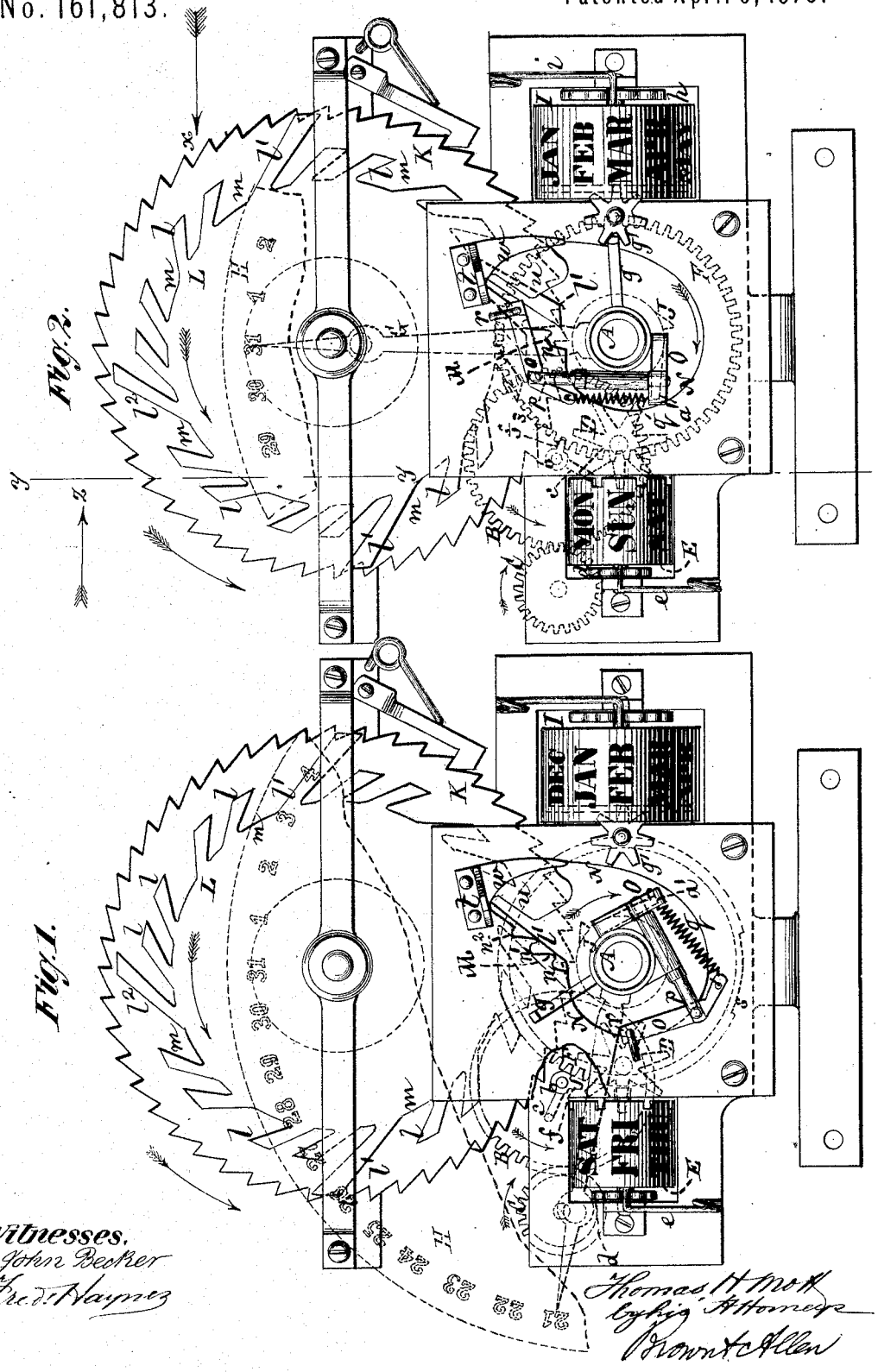

Fig. 2.

Fig. 1.

Witnesses.
John Becker
Fred. Haynes

Thomas H. Mott
by his Attorneys
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2 Sheets--Sheet 2.

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Fig. 5.

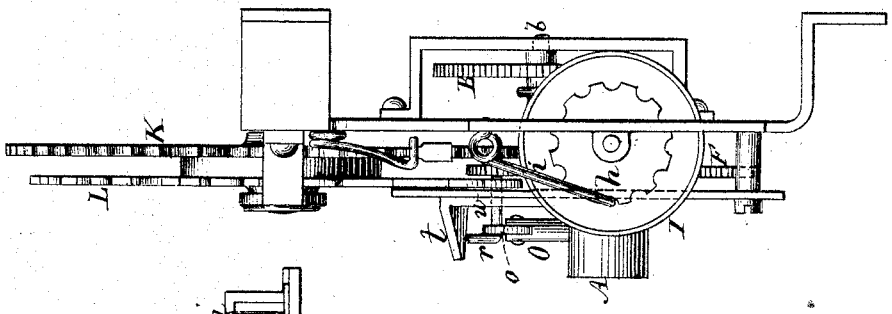


Fig. 3.

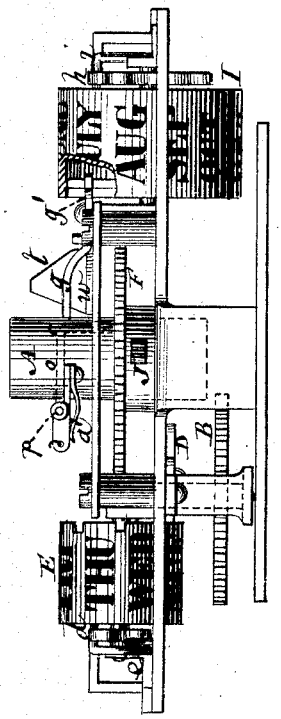


Fig. 4.

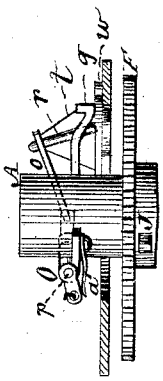
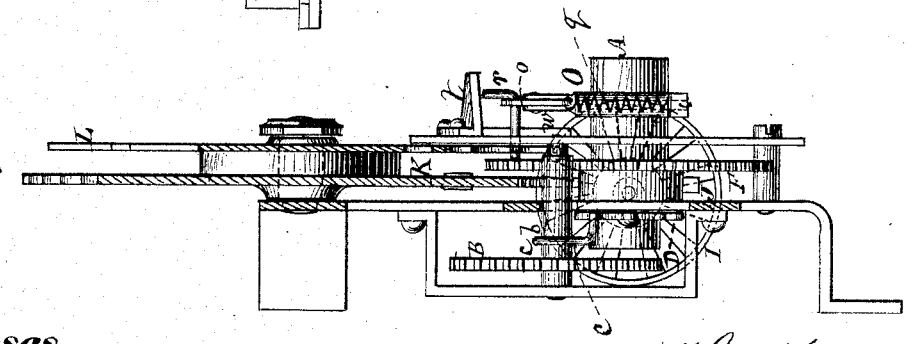


Fig. 6.



Witnesses.
John Becker
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Brown & Allen

UNITED STATES PATENT OFFICE.

THOMAS H. MOTT, OF NEW YORK, N. Y.

IMPROVEMENT IN CALENDAR-MOVEMENTS OF CLOCKS.

Specification forming part of Letters Patent No. **161,813**, dated April 6, 1875; application filed December 10, 1874.

To all whom it may concern:

Be it known that I, THOMAS H. MOTT, of the city, county, and State of New York, have invented certain new and useful Improvements in Calendar-Movements of Clocks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to calendar-clocks, in which not only the days of the week, the months of the year, and the dates of the month, in addition to the hours of the day and lesser divisions of time, are exposed or recorded, but the clock is caused to automatically make these several indications throughout a term of years, including leap-year. The invention consists in certain means, or combinations of means, whereby these results, or certain of them, are obtained, including a notched incline, mutilated covering-wheel, and a revolving spring-dog or device for automatically adjusting the indications of date, as regards the several months, both in ordinary years and in leap-year.

Figures 1 and 2 represent front views of a clock-calendar movement, constructed in accordance with my invention, showing the same in different working positions. Fig. 3 is an edge view of the same as seen from beneath. Fig. 4 is a similar view, in part, showing a changed position of certain details; Fig. 5, a side view, looking in direction of the arrow *x;* and Fig. 6, a vertical section on the line *y y*, looking in direction of the arrow *z*, Fig. 2.

While a certain or specific arrangement is here shown for the movements which are used to indicate the days of the week, the months of the year, and the days of the month relatively to each other and to the center or socket of the hour and minute hands of the clock, it will be evident from the description of parts hereinafter given that these several relations, or certain of them, may be modified without changing the invention.

A represents the hollow spindle or socket, within or through which the hour and minute hands of the clock operate, but which hands, and the dial pertaining thereto, are not shown. B is a wheel, which receives its motion in any suitable manner—as, for instance, by a train of gearing, of which C may be one of the wheels—from the hour-spindle of the clock, and is revolved once in twenty-four hours. This wheel B has attached to its spindle *b* an arm, *c*, that operates a seven-toothed wheel, D, which adjusts, once in every twenty-four hours, a cylinder or dial, E, marked with the days of the week, in order to expose each day in succession. A check-wheel, *d*, and spring *e*, operate to restrict the movement of the cylinder E to a day at a time. On the spindle *b* of the wheel B is also a single-toothed driver, *f*, which, once in every twenty-four hours, moves two teeth of a wheel, F, which contains sixty-two teeth, or, if having thirty-one teeth, is moved only one tooth at a time; but it is preferred to construct it with sixty-two teeth, and to move it two teeth each twenty-four hours, so that the hub of the driver *f* serves to enter between the teeth of said wheel, and act as a lock to the latter when not being moved, excepting at certain intervals, as hereinafter described, when the lock is removed, which may be effected by certain teeth, marked *s*, being made shorter, thus allowing for the slip of the wheel. This wheel F is fast to the hollow spindle A, which carries the index G, that serves, in connection with a dial, H, to indicate the dates of the month. Likewise fast to the hollow spindle A is an arm, *g*, which, during each revolution of said spindle and wheel F, adjusts, through a pinion, *g'*, a cylinder or dial, I, having the months of the year marked upon it, in order to expose the months in succession, a check-wheel, *h*, and spring *i* operating to restrict the movement of the cylinder to a month at a time.

In order to provide for indicating the varying number of days in the consecutive months of the year in a three-year term of years, in which there is no leap-year, and in a term in which leap-year does occur, the following means are adopted: Fast to the hollow spindle A or back of the wheel F is a single-toothed cam or projection, J, which, as it comes round once in each month, moves a ratchet-wheel, K, the distance of a tooth. This wheel K, which has its movement restricted by a spring-pawl, has forty-eight teeth, corresponding to the number of months in four years, so that it is only revolved once during

four years. Fast to the spindle of this wheel K is a mutilated wheel, L, constructed with long and short teeth or projections l, l^1, and l^2, with intervening spaces m. Some of these spaces are of uniform width, while others are of irregular width, the object of which, in connection with the long or short teeth of the wheel, will be hereinafter explained. The teeth l are all of uniform size, and are arranged between the teeth l^1 l^2, which latter are four in number, and are at equal distances apart around the wheel. The teeth l^1 are three in number, and are of greater length than the teeth l, but of equal length with each other, while the remaining tooth l^2, which is also longer than the teeth l, is a trifle shorter than the teeth l^1. These several teeth l, l^1, l^2, and spaces m, operate in connection with a notched fixed incline, M, which projects upwardly from a lower scroll or other guide, N, toward and in front of the mutilated wheel L, so that as said wheel is moved or adjusted by the ratchet-wheel K its teeth l l^1 l^2 act as covers at intervals to one or more of the notches in the incline M. The notches in the incline M are three in number, to correspond with the 29th, 30th, and 31st days of a month, but said incline is extended beyond these notches to provide for indicating the 1st of each month. These notches are lettered respectively n n^1 n^2, the lower notch n applying to the 29th day of a month, the next notch n^1 to the 30th, and the third notch n^2 to the 31st day of a month. The teeth l^1 of the mutilated covering-wheel only come round successively behind the notched portion or edge of the incline M some time during the first twenty-eight days of the month of February in those years which have only twenty-eight days in that month, while the tooth l^2 comes round to a like position only during the month of February of each leap-year.

Carried by the hollow spindle A, within the scroll-guide N, in the wake of the arm g, which operates the month-cylinder or dial I, is a spring dog or device, O, which may be variously constructed, but which it will suffice to describe as consisting of a two-armed lever, o, having its fulcrum on a turning pin or pivot, p, and which is controlled by a spring, q, applied to its shorter arm, while its longer arm carries at its outer end a pin, r. The spring q draws on the shorter arm of said lever to keep the pin r of the longer arm pressed outward against the scroll-guide N, when the whole device O is rotating within the latter.

In the operation, the pin r of the spring dog or device O does not reach the end of the scroll N, where it joins the notched incline M, till the 28th day of the month has come round, and supposing this to be the 28th of February, but not leap-year, then the mutilated wheel L will have been so adjusted that one of the teeth l^1 will cover up the notches n n^1 n^2 of the incline M, as represented in Fig. 1. The pin r having come round to the incline M, thus covered up, it, as passing the inner or lower end of said incline, is projected by the action of the spring q up along the edge of the covering-tooth l^1 to the upper or outer end of the incline, and free from interruption by any of the notches n n^1 n^2. This causes the hollow spindle A and index G to be slipped or shoved forward till the index G, jumping over three dates, viz., 29, 30, and 31, indicates the 1st of the month.

Such slipping of the parts is provided for by the teeth s of reduced prominence in the wheel F, having then—that is, at the end of a month or beginning of a new one—come round so that the hub of the driver f on the spindle b of the wheel B fails to lock the wheel F, and admits of its slipping, as described. After this, and as the wheel F is rotated, a crook on the upper end of the pin r is made to ride over a fixed incline, t, and table u, and along a curved rib, w, for the purpose of preventing the pin r from dropping into the teeth of the wheel F, and to direct it into the scroll-guide N, causing the spring q to be contracted again, and the lever o to be adjusted into its former position relatively to the pin p for a repetition in due course of the action, as hereinbefore described—that is, as said pin r again reaches the end of the scroll-guide at its junction with the notched incline on the 28th of the month.

In explanation of the movement of the crooked end of the pin r over the incline t, it is necessary to notice that said pin, while traveling within the scroll-guide N, is kept bearing down on the face of the wheel F by a spring, a', applied to an arm on the turning-pin p of the device O.

Here it may be observed that the arm g operates on the month dial or cylinder I as the pin r is shot by the action of the spring q on the lever o to the upper or outer end of the notched incline M.

When the 28th of February in leap-year comes round, then the tooth l^2 of the mutilated cylinder L covers up the two outer notches n^1 n^2 only of the incline M, so that the pin r, after it leaves its position on the 28th of said month, is next shot by the action of the wheel F into the inner notch n, thus causing the index G to indicate the 29th of the month, after which, or during the next movement of the wheel F, the pin r is projected to the outer end of the incline M, to indicate the 1st of the ensuing month, as before, the month-dial being simultaneously adjusted. The other teeth l of the mutilated wheel L simply serve to cover up the outer notch n^2 of the incline M during those months which have but thirty days in them, so that the pin r, after passing the position it occupies in the scroll-guide on the 28th of the month, is first projected into the notch n, and then into the notch n^1, before and during a succeeding movement of the wheel F, it is projected to the outer end of the incline M, thus causing the index G to record the 29th and 30th of the one month, and then

the first of the ensuing month. When, however, there are thirty-one days in a month, then none of the teeth in the mutilated wheel cover the notches in the incline M, as shown in Fig. 2, so that thirty-one days are recorded by the pin *r* entering successively in due course the notches *n* n^1 n^2 before it is projected to the end of said incline when the 1st of a succeeding month is reached.

The spaces *m* between the teeth *l* l^1 l^2 are of varied width, to provide for the entry of the pin *r* within them free from interruption by said teeth, or change in the exposure of the notches *n* n^1 n^2 during a succession of months having a like number of days in them.

I claim—

1. The combination, with the notched incline M, of the mutilated covering-wheel L and a monthly revolving dog or device, O, for operation of and in connection with the spindle A, which carries the index used to show the dates of the month, substantially as and for the purposes herein set forth.

2. The monthly revolving wheel F, constructed to slip, as described, in combination with the single toothed driver *f*, the spring-dog or device O, the guide N, the notched incline M, the index-spindle A, and the monthly dial I, essentially as specified.

3. The combination of the incline *t*, the curved rib *w*, and the scroll-guide N with the notched incline M and the spring-dog or device O, constructed to operate as described.

4. The toothed driver *f*, constructed to lock the wheel F, with provision for slip of the latter at the end of the month, as described, in combination with the notched incline M and spring-dog or device O, substantially as specified.

5. The combination of the monthly revolving single toothed cam or projection J, the ratchet-wheel K, the notched incline M, and the mutilated covering-wheel L, essentially as described.

THOMAS H. MOTT.

Witnesses:

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BENJAMIN W. HOFFMANN.