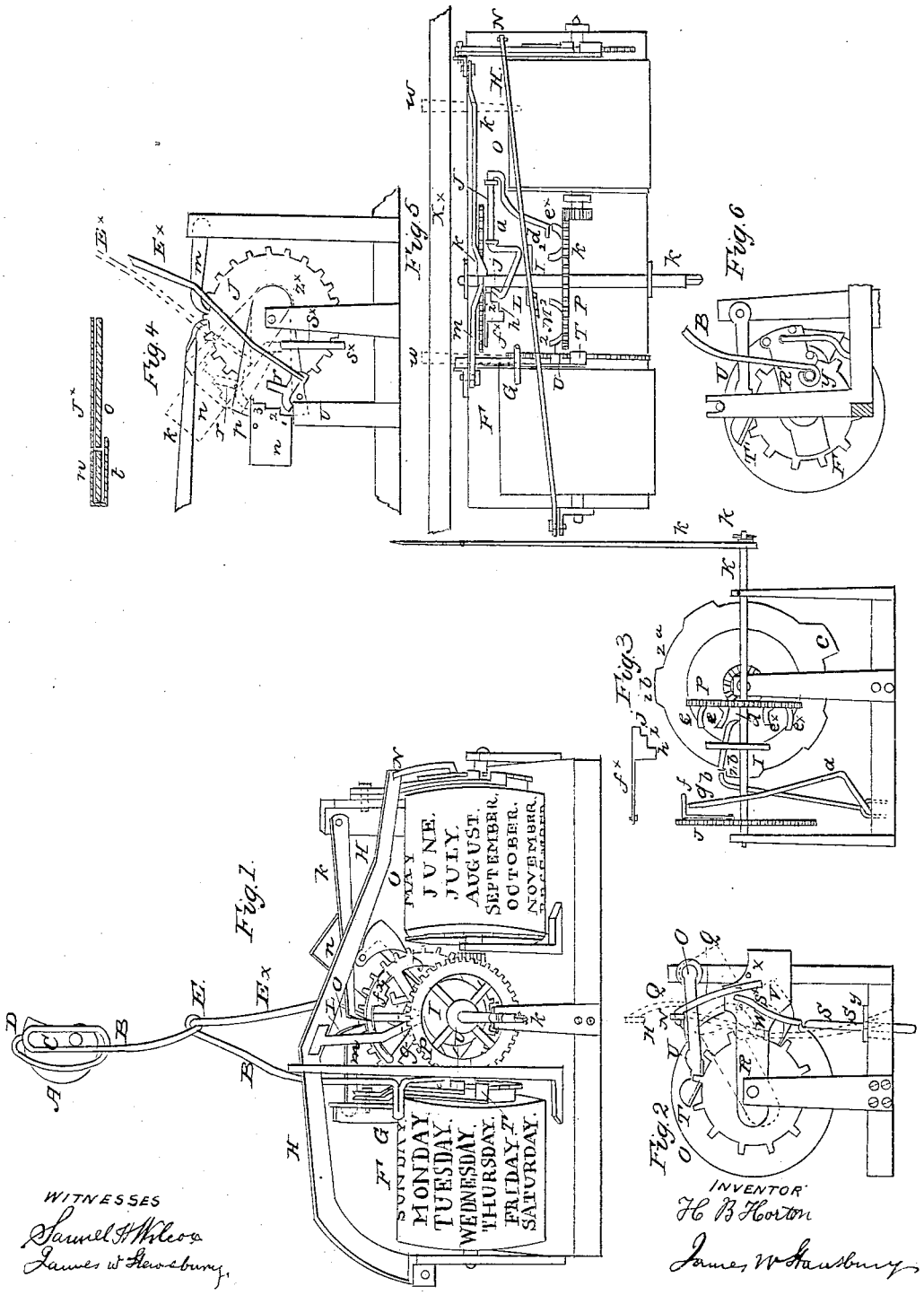
H. B. HORTON.

Calendar Clock.

No. 47,306. Patented April 18, 1865.



WITNESSES

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HENRY B. HORTON, OF ITHACA, NEW YORK.

IMPROVEMENT IN CALENDAR-CLOCKS.

Specification forming part of Letters Patent No. **47,306**, dated April 18, 1865.

To all whom it may concern:

Be it known that I, HENRY B. HORTON, of Ithaca, in the county of Tompkins and State of New York, have invented an Improved Calendar-Movement for Clocks; and I do hereby declare that the following is an exact description thereof, reference being had to the annexed drawings, and to the letters of reference marked thereon.

Figure 1 is a perspective view. Fig. 2 is my improved year-wheel; Fig. 3, my improved way of changing the lengths of the months. Fig. 4 shows how I move the month-wheel, and Fig. 5 is a top view of my calendar. Fig. 6 is an end view of the week-wheel and parts connected therewith.

My object is to show the day of the month, day of the week, and the month, making the changes instantaneously at midnight, and to hold the several wheels at all times, so that no accidental turning of them can occur and that no ordinary motion of a vessel at sea shall displace them, thus rendering the calendar-clock much more perfect than by any former device. This I accomplish as follows:

In Fig. 1, A is an eccentric-wheel, fixed in or to the time-movement of the clock, revolving once in twenty-four hours. To this is attached the bent rod B, and in a slot, C, made by bending the rod, the shaft of the cam-wheel is embraced, and the wire or rod is so recurved that the upper end, D, is raised and is let fall by the cam-wheel A, thus moving the calendar mechanism at midnight instantaneously. The rod or wire B is continued to the circle E, where it receives the rod from the month-wheel. Thence it passes on to the top of the day-of-the-week wheel F, where, at G, it makes an abrupt turn over the pawls of that wheel and immediately back again to the line it had before being bent, for the purpose of locking these pawls at certain periods. The rod B then goes down and is fastened to the weight-lever R of the day-of-the-week wheel at *y*, raising that lever and its clicks and producing its changes.

At H is seen the lever that moves the year-wheel O. This is lifted by an eccentric-cam, I, fixed on the shaft of the month-wheel J. The rod L rests on and is moved by this eccentric, and at M joins this lever, and at N the lever has a rod, 3, connecting it with the weight-lever R of the year-wheel O. The wheel P is the four-year wheel on but loose from the shaft of the month-wheel J. The pointer on the end of the shaft K moves from one number of the dial to another of the month numbers, according to the number of teeth in the month-wheel, which are thirty-one, so that 1 on the dial corresponds to the first tooth of the month-wheel, and so on to the 28, 29, 30, and 31 numbers and the corresponding teeth of the month-wheel.

Fig. 2 shows the movement of the year-wheel O. The lever H, at its end N, when lifted once each month by the cam I on the month-shaft K by the rod Q, draws up the weight-lever R, Fig. 2, so that at the moment previous to the falling of the rod L, Fig. 1, off of the cam I simultaneously with upper end of the rod D off of A, Fig. 1, the several parts appear as represented by the dotted lines.

When I make a marine calendar-clock, it is necessary to fix the upward movement of the levers H and R and pawls T and U by the use of springs or cams or flanges on the wheels or other devices, all acting on the principle of the stop or pawl S, or as simple checks of the sea motion and its contingences, and these I introduce so that each part shall be either checked or restrained so that it cannot be displaced, so that I extend the method of grasping the part as I do the tooth W, so that no accidental movement can take place.

By the falling of the lever R to its lowest place it moves the year-wheel the distance of one tooth or one month—for example, changes from June to July.

When the weight-lever R is down, the stop or rod S has no connection with any tooth of the year-wheel, but hangs free by its upper attachment, *s x*, and in the guide-block or aperture *s y*, which acts as a cam-guide when necessary in either of the wheels to which it is applied; but as the pawl V is drawn up to move another tooth the rod S comes under whatever tooth is at W, as shown in dotted lines just before the pawls T and U change, and just before the pin or projection *x* lifts the pawl U the rod or stop S has fixed the tooth W, and as the pawl U is lifted the pawl V embraces the other side of the tooth W, and thus with the pawls T and U fixes the year-wheel in such a manner that at no time is it for an

instant free from pawls or stops, and thus no mistake can occur in its movements. The day-of-the-week wheel F, Fig. 1, is moved by exactly the same device, the only variations being that the junction of the wire B to the weight lever is at *y*, Fig. *c*, and by the rod B, Fig. 1, from the cam-wheel A, and the wheel has fourteen instead of twelve teeth, arrangements that any one can make.

In Fig. 3, Z is the month-cam on the year-wheel. The cams on its surface move the bent rod *a* by means of the suitable bearing-surface, *b*, which is the only use of this cam-disk, except that the larger cam, *c*, throws back the bent rod *a* so that its end *d* shall clear yet bear upon the February projections of the four-year wheel *e e e* and *e x*, three of which cause the change to be for twenty-eight days, and one, *e x*, is shorter than the others for twenty-nine days in February in leap-year, which changes are made by means of the bent rod *a* and the cam *f*, a top view of which is seen at *f x*. The action of this bent rod and cam is when a blank occurs in the year cam-disk Z, as at *z a*, the bent rod *a* does not touch the cam *f* on the month-wheel, and therefore there are thirty-one days in that month. When the cam, as at *z b*, strikes the bearing-surface *b* of the bent rod *a*, the end of the bent rod *g* goes under the first tooth, *h*, of the cam or slide *f x*, and thus slides the month-wheel by the thirty-first tooth of the month-wheel, so that that month has but thirty days; and when the cam *c* on the year-disk Z strikes the bearing *b* on the bent rod *a*, the cam *c* forces the bent rod *a* outward, so that its end *d* comes against the tooth *e x* of the four-year wheel P, where it rests until the other end, *g*, of the bent rod *a* goes under the tooth *i* of the cam *f x*, and thus slides the pawl *k*, Fig. 1, over the thirtieth and thirty-first teeth of the month-wheel, making leap-year; and when the month of February comes against either of the projections *e e e* on the four-year wheel the end, *g*, of the bent rod goes under the tooth *j* of the cam *f x*, and that month has twenty-eight days.

In Fig. 4 is seen the weight-lever *n*, to move the month-wheel J, composed, as at J *x*, of the long lever bent over the lead weight *t* and lapping a short distance on the shorter and broader lever *o*. This weight-lever turns on the shaft of J, and has on its broad member the adjustable pawl *r*, to which the rod E *x* comes from the twenty-four hour cam in the time-movement of the clock, through the knot or eye E, Fig. 1. On the weight-lever *n* is a pin projection, *p*. The action of the mechanism is, that when drawn up by the rod E *x* a pawl or click behind, and fast to the lever *n*, catches into a tooth of the month-wheel J, and the pin or projection *p* lifts the pawl K, and as this is done the pawl *m* holds the wheel from any backward motion, while the pawl or catch *s x* holds a tooth at the bottom of the wheel from a forward motion, so that the movements of the month-wheel are at all times fixed by pawls against accidental changes. The pawl or stop *s x* can be made substantially as S, Fig. 2, and is so made for a marine clock.

When the cam A, Fig. 1, releases the rod B at its point D, the whole mechanism and wheel J rotate on the axis *z x*. If the month has thirty-one days, the stop *v* checks the movable pawl *r* and the weight-lever stops, so that on the drawing of E *x* again the upper part of *r* catches in the tooth one of *n* and leap-year in the tooth 2; and when February has twenty-eight days in tooth 3; in which last case the weight-lever *n* is seventy-two hours in regaining its full adjustment.

The parts are many of them more clearly seen in the top view, Fig. 5, where they have the same letters as in the other figures.

At X *x* is the wooden back of the clock-case, and through it two pins, *w w*, are put when the clock is to be transported. The one locks the bent-rod projection G of B, Fig 1, which projection bears on the pawls T and U of the day-of-the-week wheel, and thus that part of the calendar is rendered immovable, and the other locks the long lever H, which rests on the corresponding pawls of the month-wheel and makes that immovable, and by the same two pins the pawls *m* and *k* of the month-wheel are secured, so that wheel is also immovable. After transportation these pins are removed, and the calendar is at once in order for use, with no care or time expended to adjust it.

Having described my invention so that those skilled in the art to which it appertains can make and use the same, what I claim as my invention is—

1. The use of the stops or pawls S and *s x* or other equivalent device, for the purpose of fixing with precision the movements of the month, the day-of-the week, and the year wheels, as described.

2. The lever-cam *f* on the month-wheel J, for the purpose of passing the stop or pawl K over the thirty-first tooth of the month-wheel for months of thirty days, and over the thirtieth and thirty-first teeth for February in leap-year, and over the twenty-ninth, thirtieth, and thirty-first teeth of the said wheel when February has twenty-eight days, or otherwise using the said lever-cam *f* for the same purpose.

3. The detached lever *a*, for the purpose of changing the length of the months, and of February in leap-year in a thirty-one-toothed-month-wheel, and also the detached lever when acting in combination with the lever-cam *f* of the month-wheel, the cams on the year-disk, and the projections on the four-year wheel.

4. Putting on, but not fixing fast, the four-year wheel to the shaft of the month-wheel, as described.

5. The wide cam *c* on the corrugated disk Z of the year-wheel, or its equivalent, for the

purpose of carrying the bent-rod lever *a* on the projections of the four-year wheel.

6. Operating the calendar by the slotting of the rod B about the shaft of the cam A for retaining the rod in its place, and also by the combination of the cam A and rod B, producing the changes of the calendar instantaneously at midnight.

7. Securing by the pin W the double flexion of the rod B at G, and thus the pawls T and U, and also holding the lever H by the other pin *w* and the pawls under it, and also by the said pins the pawls *m* and *k*, thereby preventing any displacement of the calendar during transportation.

8. The click *r*, for reducing the labor of bringing up the weight-lever *n* during a period of seventy-two hours or less, according to the distance the lever falls by the length of different months.

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Witnesses:

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