

N. T. WORTHLEY.
Clock-Calendars.

No. 142,975.

Patented September 16, 1873.

Fig. 1.

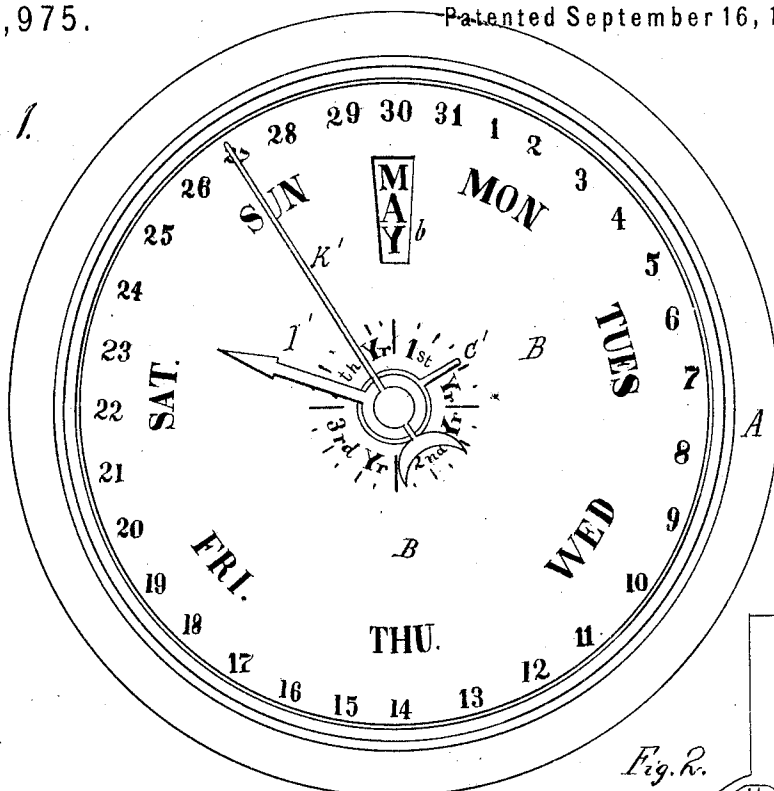


Fig. 2.

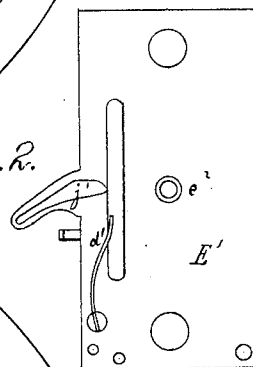
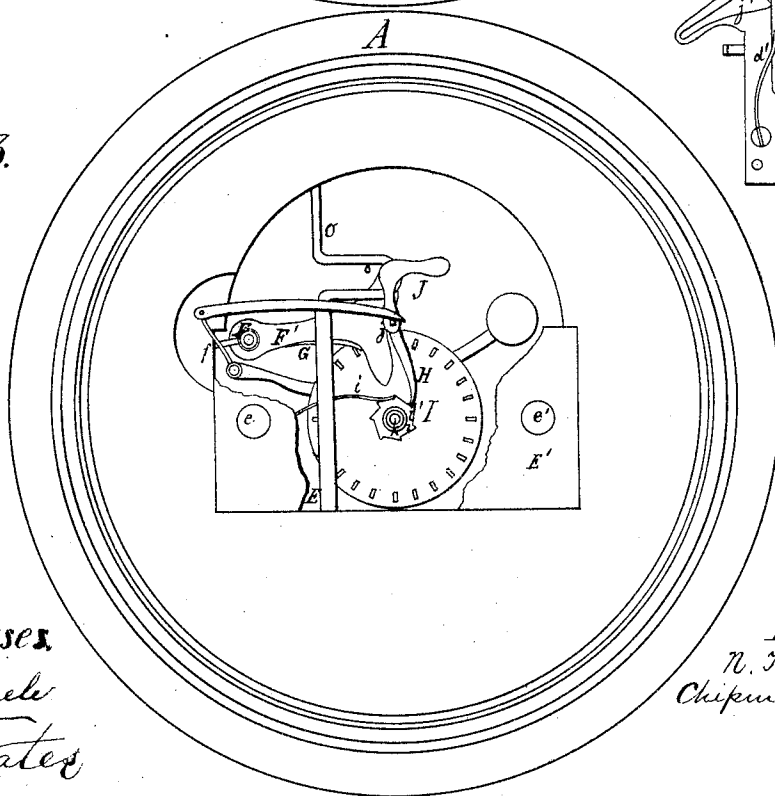


Fig. 3.



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Fig. 4.

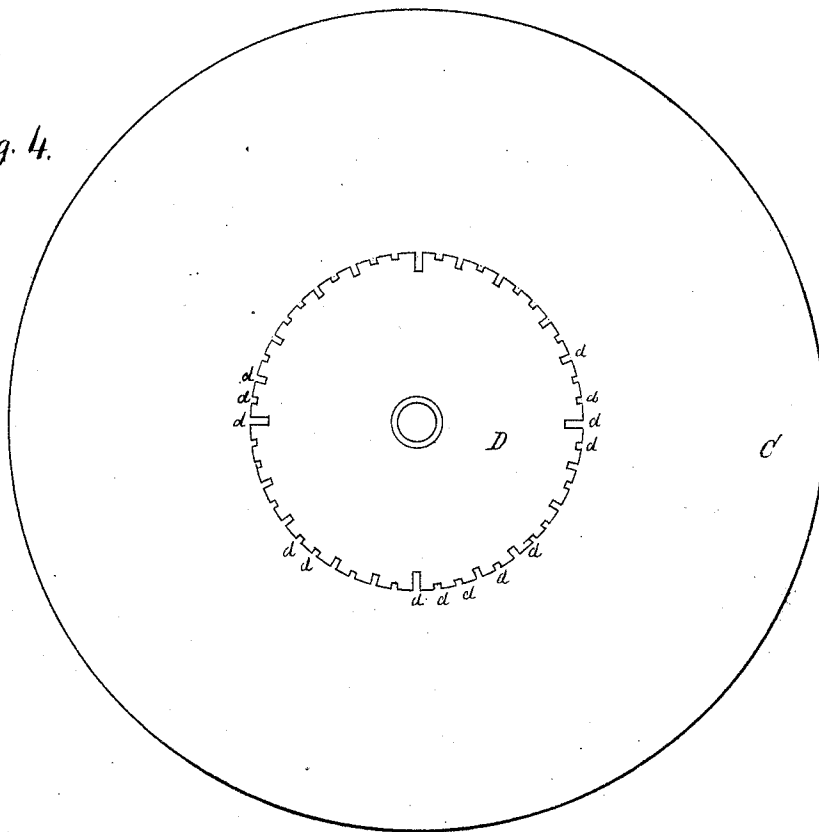


Fig. 5.

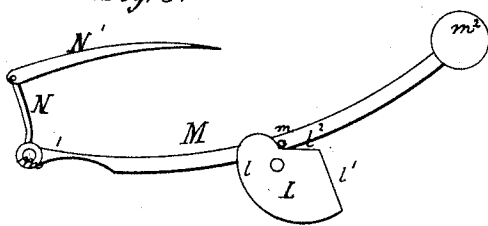


Fig. 6.

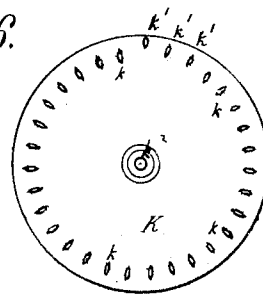
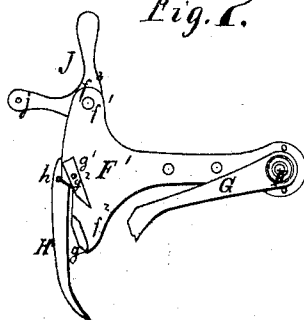


Fig. 7.



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UNITED STATES PATENT OFFICE.

NATHANIEL T. WORTHLEY, OF BRUNSWICK, MAINE.

IMPROVEMENT IN CLOCK-CALENDARS.

Specification forming part of Letters Patent No. **142,975**, dated September 16, 1873; application filed June 14, 1873.

To all whom it may concern:

Be it known that I, NATHL. TRUE WORTHLEY, of Brunswick, in the county of Cumberland and State of Maine, have invented a new and valuable Improvement in Calendars; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a face view of my calendar. Figs. 2, 3, 4, 5, 6, and 7 are details of the same.

My invention relates to calendar-motions; and it consists of a number of wheels, each with an appropriate number of teeth or notches, representing the months in a year, the days in a month, and the days in a week, which are operated by a counting-lever, and show on a fixed dial, with dial-fingers, the names of the days in the week, the date of the month, and through an opening in the dial, by a revolving disk, the name of the month. The object of my invention is to make an almanac, operated by hand or by a clock, which points out the full date of the year, and may be worked without interruption through a large number of years, including leap-years, and which, on account of the simplicity of construction, may be sold at a very low price.

In the drawings, A represents a disk or frame, generally made of wood, to which a dial, B, with a slot, *b*, is fastened. The dial B is marked with all the numbers from one to thirty-one, representing the days of the month. In a circle concentric to that of the said numbers, the names of the days of the week are arranged, as seen in the drawing. In a very small circle at the center of the dial four years are marked, with their forty-eight months. The slot *b* in the dial B exposes the names of the months on a movable dial, C, behind, which is fastened to a wheel, D, with forty-eight notches, representing the months of four years' time. The said notches *d* are of different depths, to answer the purposes hereafter described, and four of these, which answer the representation of the second month in each year, are of very great depth, to effect the release from the counting-wheel, as here-

after more fully described. The whole motion, except the revolving dial C and the wheel D, is inclosed in a frame composed of two parallel plates, E E', which are united by two heavy studs, *e e'*. Motion is received by a hand-lever, *f*, on a shaft, F, to which the double-acting lever F' is fastened. The lever F' has a hammer-shaped head, with two rounded ends, *f*¹ and *f*². To the lower end *f*² a double-edged cam, *g*, is fastened, above which a movable cam-lever, *g*¹, is pivoted to a pin, *g*², to which, on the other side of the lever F, a pawl, H, is fastened, which works a ratchet-wheel, I, with seven ratchets. The upper end *f*¹ is provided with a boss, *f*³, to which a weighted bell-crank lever, J, is pivoted. The lever J has an adjusting-pin, *j*, at its lower end, which works in a slotted guide, *j'*, on the plate E', and dips into the slots or notches *d* on the wheel D, the different depths of which are in accordance with the different numbers of days in the twelve months. The cams *g* and *g*¹ operate the month-wheel K, with thirty-one pegs, representing the highest number of days in a month. Of these pegs, twenty-eight (*k*) are concentric to the axis of the said wheel K, and three (*k*¹) are diverging outwardly from the circle. The wheel K is prevented from moving back by a pawl, G, Fig. 7, swinging on the shaft F, and operating on the pegs *k*. The back motion of the wheel I is prevented by a spring-pawl, *i*, Fig. 3, and the back motion of the month-wheel D is prevented by a similar spring-pawl, *d'*, Fig. 2. The shaft to which the wheel K is attached carries the cam L, Fig. 5, which has an ascending bearing-surface, *l*, beginning opposite the first concentric peg *k*, and reaching its summit opposite the last or twenty-eighth concentric peg *k*, from where it returns to its starting-point by an inclined straight line, *l'*, and a vertical line, *l''*. On the surface of the cam L a pin, *m*, on a lever, M, travels while the cam is revolving, and a weight, *m*², on the end of the lever gives power to it to operate the pawl N' and the lever N, which is fastened to the same shaft, *m*¹, to which the lever M is fastened, and which propels the wheel D. The wheel D revolves on a socket-bearing, *e*², Fig. 2, which protrudes from the plate E', and forms the bearing for a hollow axle, *e'*, to which the

wheel I is fastened, Fig. 3, and through which the shaft k^2 passes. The revolving dial C has a pointing-finger, C' , Fig. 1, pointing to the months and years of four consecutive years marked on the smallest circle of the dial. The shaft k^2 has a finger, K' , which points out the date of the month on the largest circle of the dial B. The hollow arbor or axle i' carries a finger, I' , which points to the names of the days arranged on the second circle of the dial B. When the calendar is to be operated by a clock, the connection is made by a drop-lever, O, with a double crank, o, Fig. 3, which moves the boss f^3 on the lever F' . When the lever F' is moved up the lever H leaves its place and moves along the inclination of the next ratchet-tooth until it slips over its edge. At the same time the cams g and g^1 pass up between two of the pegs k , and as soon as the cam g^1 has got above the said pegs with its lower edge the pin h strikes the lever F' , and keeps the said lower edge in such position that in its descent it glides over the next peg and moves it forward. The said descent of the cam g^1 causes also the descent of the pawl H, by which one ratchet-tooth of the wheel I is moved forward, and the finger I' points to the next day, while the finger K' has moved to the next date, and the pawl G has entered between the next two pegs k . In ascending, the cam g^1 is pushed toward the cam g by the next peg, thereby preventing the wheel K from being moved. The up-and-down movement of the lever F' causes the pin j to slide up and down on the inner curve of the slot j' , the termination of the stroke being the upper end of the slot j' , and the bottom of one of the slots d in the wheel D. If the slot d is deep, the pin j causes the lever F' to descend lower than usual, and the upper part of the cam g^1 passes down to within the centers of the pegs k , but passes below the pegs k^1 . Therefore, as soon as the last concentric peg k is released, and the cam g^1 has finished its down-stroke, the diverging pegs k^1 are caused, by the action of the weight m^2 and the pin m on the inclined surface l^1 of the cam L, to slip forward over the cam g^1 , and to move the finger K' to the number 1 on the dial D. This answers the requirements of the month of February, and every fourth of the deep slots d is of less depth to permit only the last two of the diverging pegs k^1 to slip over the cam g^1 , and thereby include one of the pegs k^1 in the number of the regular working and counting pegs. The finger K in this case points out twenty-nine days, and then moves to the first day again. The months with thirty days are represented

by slots d of less depth than that of the last-named case, and they permit only one of the pegs k^1 to slip over the cam g^1 . The months with thirty-one days are represented by the shallowest slots d on the wheel D, which causes all the pegs k and k^1 to be successively operated, and consequently there is no slip over the cam g^1 , and no skipping of any of the numbers on the dial B by the finger K' . To prevent the forward slip of the pegs k^1 when the cam g^1 is raised, the said cam is made to overlap the cam g , which arrests the progress of the said pegs until the cam g^1 has engaged the following peg. The descent of the lever M causes the forward motion of the pawl N' by the lever N and the turning of the wheel D to the next slot d , in which motion the rotating disk C participates, thereby exhibiting the name of the next month through the slot b in the dial B, and moving the finger C' to the next monthly mark of the small index on the dial B.

This calendar-motion is correct for the term of four hundred years, when the omission of the bissextile day makes a correction necessary, which consists in the skipping over the three diverging pegs k^1 , instead of two, and may easily be effected by moving the cams g and g^1 above the range of the pegs k^1 , and adjusting the wheel K by hand.

What I claim as new, and desire to secure by Letters Patent, is—

1. An automatic calendar-motion composed of the rotating disk C, the four-gear wheel D, the month-wheel K, the cam L, the levers M and N, the pawls N', G, and i , and the lever F' , with the lever J, the pawl H, and the cams g g^1 , substantially as specified.

2. In a calendar-motion, the combination of the wheel D and the lever F' with the lever J, the pawl H, the pin h , the cam g^1 , the pin g^2 , and the cam g , constructed and arranged substantially as and for the purpose set forth.

3. In a calendar-motion, the combination of the revolving cam L with the ascending curve l , the inclined bearing l^1 , and the vertical return line l^2 , and the weighted lever M with the pin m , the shaft m^1 , the lever N, and the pawl N', constructed and operated substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

NATHL. TRUE WORTHLEY.

Witnesses:

AMANDA J. WORTHLEY,
GEO. BARRON.