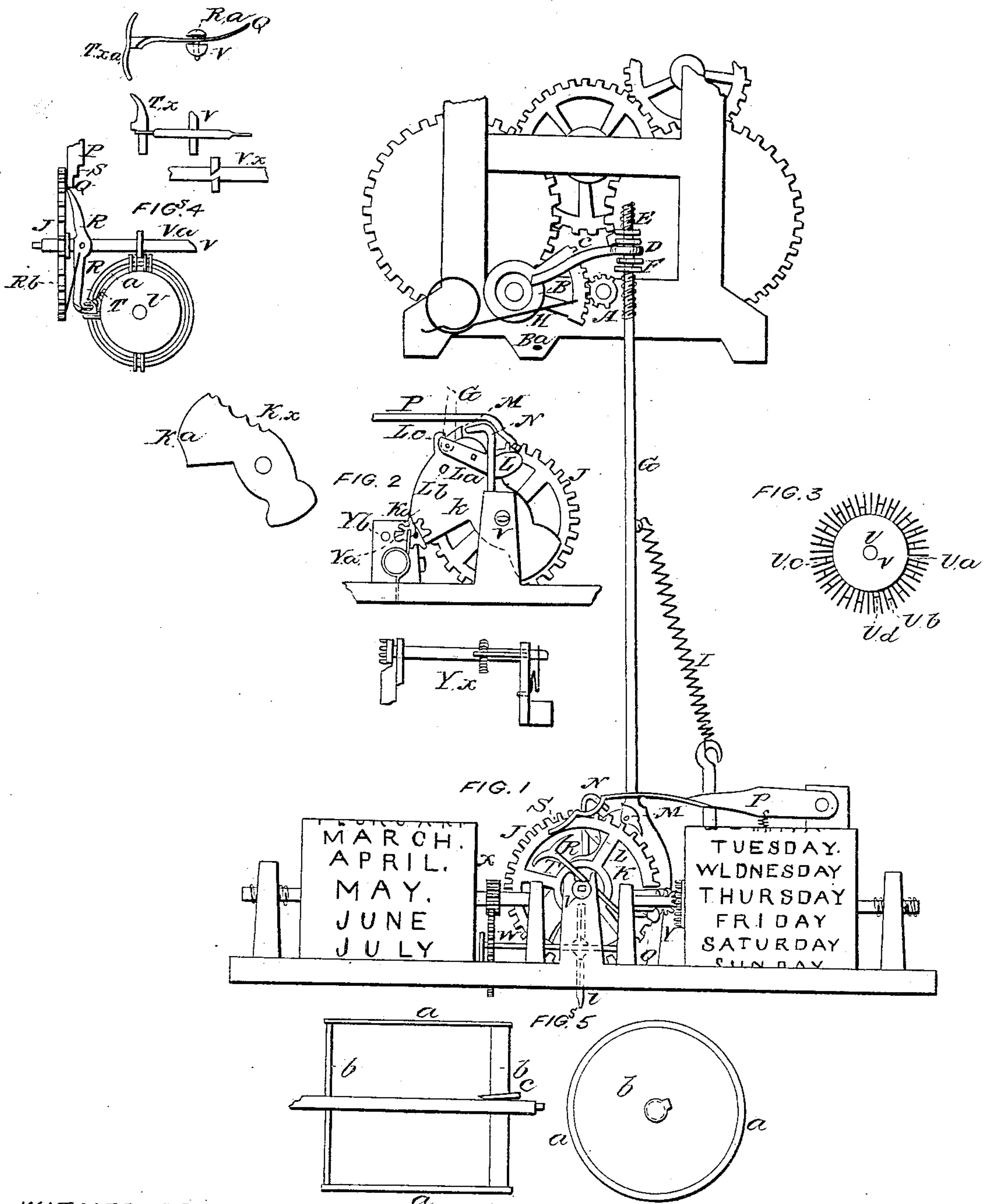


CLINTON & MOOD.

Calender Clock.

No. 66,003.

Patented June 25, 1867.



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CHARLES M. CLINTON AND LYNFRED MOOD, OF ITHACA, NEW YORK.

Letters Patent No. 66,003, dated June 25, 1867.

IMPROVEMENT IN CALENDAR CLOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, CHARLES M. CLINTON and LYNFRED MOOD, of Ithaca, Tompkins county, New York, have invented certain improvements in Calendar Clocks; and we do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings, and to the letters marked thereon.

Our object is accuracy and simplicity in the calendar and its changes. This we accomplish by several devices:

First. A device for the twenty-four hour escapement of the time movement. For this we make a small segmentary wheel, turned once each twenty-four hours by any convenient part of the time-works. This wheel has teeth enough to raise the escape-segment, and at least one tooth blank or wanting. In this twenty-four hour wheel plays a larger segment, having the same or any convenient number of teeth, and secured to it is an arm which rises and falls with it. The action is that after, at or near midnight, the segment and arm have fallen, the first tooth of the twenty-four hour wheel comes in contact with the first tooth of the escape-segment, and raises it and its arm until the last tooth of the twenty-four hour wheel slips off the last tooth of the escape-segment, when it and its arm fall and the connecting-rod of the calendar with it, thus effecting the changes as said, at or near midnight.

Second. A device for making the necessary differences in the fall of the connecting-rod, for the thirty, twenty-nine, and twenty-eight days, adjustable at the arm of the escape-segment. To do this we fasten a bur sufficiently low on the connecting-rod for the full fall of the escape-segment arm, and secure it by a jam-bur against it. Then at the proper but adjustable point above the eye of the escape arm, we put on another bur and its jam-bur above it. Thus the space of rod between the two sets of burs gives the play in the arm-eye or fastening necessary for the unequal length of different months, and also secures the accurate setting of the calendar with the time movement.

Third. We so make our devices that but one rod connects the time escape just described with the calendar. This is effected by the escape described and by other devices to be named.

Fourth. We use the device of making our thirty-one days wheel escape-detent with digitations or variable cam spaces for the twenty-eighth, twenty-ninth, and thirtieth days month diversities, thus placing them on a part of the calendar easily made and little liable to get out of order.

Fifth. We make and use a novel and peculiar hinged lever on the axis of the thirty-one days wheel. This lever has four uses: the first is, the smaller end acts by holding up the escape-detent of the thirty-one days wheel, while that wheel is passing to its place of beginning the month, or to the tooth for the first day of the month, thus freeing that wheel of the supernumerary teeth in the months in which they occur; the second, that its larger end acts as a detent to the month-wheel, so that it locks that wheel whenever it is released by its slotted escape; the third, that by its shoe-shaped cam surface on its larger end, the bearing or action is made by the variable tooth spaces of the month-wheel, so as to guide the smaller end of the hinged lever to its proper place of holding up or not holding up the digitations of the escape-detent of the thirty-one days wheel; the fourth, that a further and convex cam surface on the larger end acts on the teeth of the month-wheel, and revolves that wheel one tooth or one month, just at the instant when the cam-escape of that wheel allows it to act at the end of each month, and that, too, without releasing its detent or lock on the month-wheel until the cam-escape has locked it again.

Sixth. We make a novel movement of the month cylinder or register, by gearing, either directly or by intervening cog-wheels, the said cylinder into the month-wheel teeth, and thus fix the motion of that part of the calendar.

Seventh. Our month-wheel is made for all possible months, and is a very peculiar one. It is made for any convenient number of years, and moves one tooth each month by means of the hinged lever aforesaid, and it moves the month-cylinder as described, and clears the thirty-one days wheel of its supernumerary days. The latter is done by making, for example, the month-wheel with forty-eight teeth, all of the same depth, except as when varied for the different lengths of different months. For months of thirty-one days the spaces between the teeth are of full depth, and no action is had on the sleigh-runner or shoe-shaped cam of the larger end of the hinged lever. In a month of thirty days the shoe-shaped cam is thrown out by the greatest filling of the tooth-space, and that brings the smaller or pointed end of the hinged lever so that it holds up the escape-detent of the thirty-one days wheel over one tooth of that wheel. In a month of twenty-eight days the shoe-shaped cam surface of the hinged lever is thrown out a less distance by a less filling of the space between the teeth of

the month-wheel and the mechanism described. In a month of twenty-nine days, or leap year, an appropriate filling of the tooth space accomplishes the same purpose by the aforesaid mechanism, at which time the wheel has made one revolution, and every possible month change.

Eighth. We make a novel device for revolving the day of the week cylinder. It consists of a vibratory cog-wheel and shaft, playing in and out of the thirty-one days wheel at one end, and geared into cogs on the shaft of the day of the week cylinder at the other end. A perfectly controlled action is necessary. This we accomplish by making the end of the shaft fixed near the cylinder, and by putting the other end of the shaft in a slot in a stud, and by a spring keeping it in gear with the thirty-one days wheel, except when the change of one day has been made. Then as soon as one day change of the week cylinder has been made the cogs on this shaft go out of gear by the action of a cam, and are held from further motion by a detent. That cam is made on the weight lever of the thirty-one days wheel, and that detent is a simple horizontal stud. This makes this device complete, while it allows the thirty-one days wheel to revolve more than one tooth.

Ninth. The weight of solid cylinder for the days of the week and for the months is useless and a detriment. We construct ours wholly or in part of paper, using thin metal or wood for the ends.

Tenth. Convenience for moving the cylinders while the calendar is at rest is desirable. To effect it we make the holes for the shafts of our cylinders a little smaller than the shaft. This gives a friction, aided, when necessary, by wedges or other means, such that intentionally the cylinders can be set or moved while there are no changes or motion of the calendar.

Eleventh. No marine movement can be accurately made without absolute automatic command over all its parts. The same is useful in transportation. We have described all parts of our calendar as thus under automatic control except the connecting-rod between the time movement escape and the calendar, and to a limited degree our time movement escape-segment. For these we use one or more springs, so made as to hold the parts in place against ordinary vicissitudes, and yet move by the mechanism of the clock.

Twelfth. The escape of the month-wheel is peculiar. We make it by a small plain wheel, with one bevelled slot or tooth space in it. The plain portion of it holds the month-wheel at all times except when the hinged-lever holds and moves it, when one tooth of the month-wheel escapes or moves through the slot or tooth space in it. This is apparent in the drawings, in which different colors are used the more clearly to designate the several parts.

Figure 1 is our calendar connected by a rod to the time movement.

Figure 2 is a view of the back part of the thirty-one days wheel and its attachments.

Figure 3, a view of our month-wheel.

Figures 4, our hinged lever; and

Figures 5, views of our cylinders.

In fig. 1, A is the twenty-four hour segmentary wheel connected with the time movement; and B the escape-segment, which falls once in twenty-four hours to the stop-pin B *a*, and gearing at intervals into the twenty-four hour wheel A; and C is the escape-arm fixed in the hub of B; and D the arm-eye playing for the supernumerary days between the burs E and F on the connecting-rod G; and H is the escape-segment spring; and I the connecting-rod spring; and J the thirty-one days wheel; and K the weight-lever of that wheel, with which it is connected by the tilt-lever L; and M is the pawl or dog that turns the thirty-one days wheel; and N is the stop that prevents too great upward motion of the pawl M, and thus of the parts connected with it; and P is the escape-detent of the thirty-one days wheel, showing its digitations or supernumerary days cams at its end S; and R is the hinged lever, by its lesser end Q holding up the escape-detent P, and by its greater end T moving the month-wheel U, seen by the dotted lines just below the axis V of the thirty-one days wheel. At W is the gearing of the month cylinder X into the month-wheel U, and at Y is the vibratory gearing connecting the day of the week cylinder with the thirty-one days wheel. In fig. 2, L is the tilt-lever that receives the action of the time escape-rod G, and which hinged in its centre at L *a*, tilts the thirty-one days escape-detent over the teeth of the said wheel. Its action is restrained by the lower stop L *b*, and by the upper stop L *c*, both on K, the weight lever aforesaid. It is noticeable that at K *a* is a curve or cam on this weight lever, for the purpose of throwing, by its journal, the vibratory cog-wheel Y out of gear with the thirty-one days wheel, just as soon as one day's motion of the day of the week cylinder has been made. The slot for the vibratory motion thus produced is seen at Y *a* in a stud, and Y *b* is the horizontal detent projecting through this stud. A spiral spring is seen bearing on the said journal to keep the cog-wheel in gear with the thirty-one days wheel, as soon as released by the cam K *a*. At Y *x*, just below, is seen a small figure showing a side view of the vibratory journal and its cog-wheels; and at K *x*, at the left hand, is the weight lever, and more clearly its cam K *a* as aforesaid. In fig. 3, U is the month-wheel; and U *a* is the tooth space for thirty-one days; U *b* for thirty and U *c* for twenty-nine days; and U *d* for twenty-eight days in the various months, as described. The length of teeth beyond this is for the purpose of holding the greater end of the hinged lever, and of the slotted escape-wheel at proper times. In figs. 4, J is the thirty-one days wheel; and V its axis; and R the hinged lever, hinged at R *a* to the axis V, and with a spring, R *b*, holding the lesser end Q in contact with the thirty-one days wheel, except when the greater end moves it out to meet the digitations S of the escape-detent described, by the tooth spaces of the month-wheel. At V *a* the month-wheel escape is in the act of releasing a tooth, while the greater end of the hinged lever has just locked the teeth at another point. At V *x*, just above, is a figure showing the slot in the slotted escape-wheel; and at T *x* is the shoe-shaped cam surface of the hinged lever, seen by looking down on it; and at T *x a* the described convex cam surface of the hinged lever which holds and revolves the month cam as described above. In figs. 5 are views of the cylinders which have the names of the months and days of the week on them; and *a a* are the paper sides, and *b b* the thin metal, paper, or wood ends bored as aforesaid for the axes, and with the wedge *c* to aid the friction on the said axes. The other parts and uses of our devices are apparent to those skilled in the art to which they appertain.

Claim.

1. We claim the twenty-four hour escape made by the segmentary wheel A, segment B, and arm C, when substantially made as described.

2. We claim, in combination with the arm C, the use of the eye D or its equivalent, acting in a variable and changeable space between the nuts or burs E and F or their equivalents, both for the purpose of holding and adapting our various devices to each other, and to allow a constant movement of our time escape arm C, while the rod G moves different or diverse distances, according to the variable length of the months of the year, and also for adjusting the calendar and clock-works to each other, as set forth.

3. We claim the springs I and H, acting on the connecting-rod G and the segment B, either one or both, for preventing contingent or unintentional changes or displacements, and yet allowing the changes to be made by the mechanism of the clock and calendar at their appropriate times, as described.

4. We claim the combination of the spring I with the rod G, as described, for the purposes of retracting the said rod, or rod and its connecting parts, and operating the calendar correctly through our other devices, be the position of the clock and calendar what it may, and also for the purpose of obtaining a complete or supplementary driving power for our calendar, as described.

5. We claim gearing the month cylinder into the month-wheel, either directly or by intermediate cog-wheels, as described.

6. We claim the vibratory shaft and cog-wheel, or any similar device, and the gearing the same in any manner with the thirty-one days wheel, or days of the month device, when so made as to revolve the days of the week cylinder one or more days' space, as described.

7. We claim putting or making the cam for throwing out of gear the vibratory shaft, and its cog-wheel on the weight lever or cross-bar of the thirty-one days wheel, and we claim the detent Y b for holding the said cog-wheel and its connected parts fast while out of gear, and we claim the gearing of the day of the week cylinder into the vibratory device, the whole of these just-named parts as a combined whole, or each acting separately by itself, as described.

8. We claim the fixed stop N, for checking the upward motion of the weight-lever or cross-bar by the pawl or dog M, or other convenient part connected with the said lever or bar, as described.

9. We claim making our registers or cylinders of calendar clocks, either wholly or in part of paper or other similar light material, for the sake of their lesser weight and strain on the mechanism of the calendar as described.

10. We claim the specific device of a month-wheel, made by the variable depth of teeth U a, U b, U c, and U d, to accomplish every possible month change reasonably requisite in a calendar clock, as figured and described.

11. We claim the device of putting the month-wheel in direct communication with the thirty-one days wheel shaft, or any part or portion of the thirty-one days wheel or shaft, as described.

12. We claim placing the month-escape cam on the shaft of the thirty-one days wheel, so that one tooth or month of the month-wheel escapes in every revolution of the thirty-one days wheel.

13. We claim a wheel, cam, or escape, so made and operated as to act as a stop or detent to the month-wheel, and yet allow at the proper time that wheel to revolve as described, and also the making of an additional length of teeth to the teeth of the month-wheel, so as to fit and embrace the said cam or escape, as described.

14. We claim the hinged lever substantially made as described, and operating so as to produce the described results on the month-wheel, and escape-detent of the thirty-one days wheel, on either one or both of the said parts, as described.

15. We claim the employment or use of a hinged lever on the shaft of the thirty-one days wheel, when accomplishing any one or all of the purposes described.

16. We specifically claim the shoe-shaped and convex cams, one or both, on the end T of the hinged lever, as described.

17. We claim centring and connecting the devices of the hinged lever R, the cam or escape V a of the month-wheel, the month-wheel U, the vibrating arm and cog-wheel Y, and through the said month-wheel and said cog-wheel, the month and the day of the week cylinders immediately with the axis V of the thirty-one days wheel, or that wheel itself as described, thus simplifying and making more compact our calendar.

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