(No Model.) 2 Sheets—Sheet 1.

T. H. HOVENDEN.

CALENDAR.

No. 551,638. Patented Dec. 17, 1895.

Fig. 4.

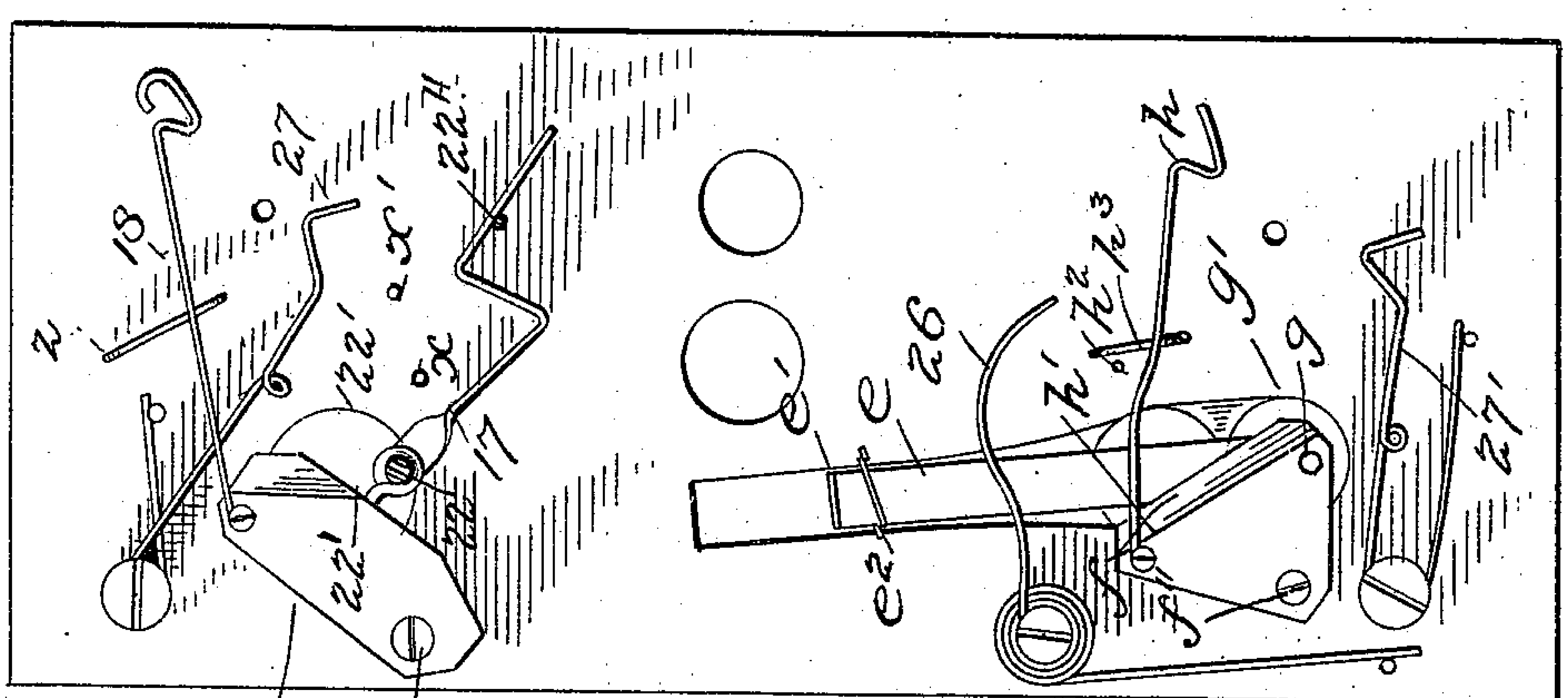
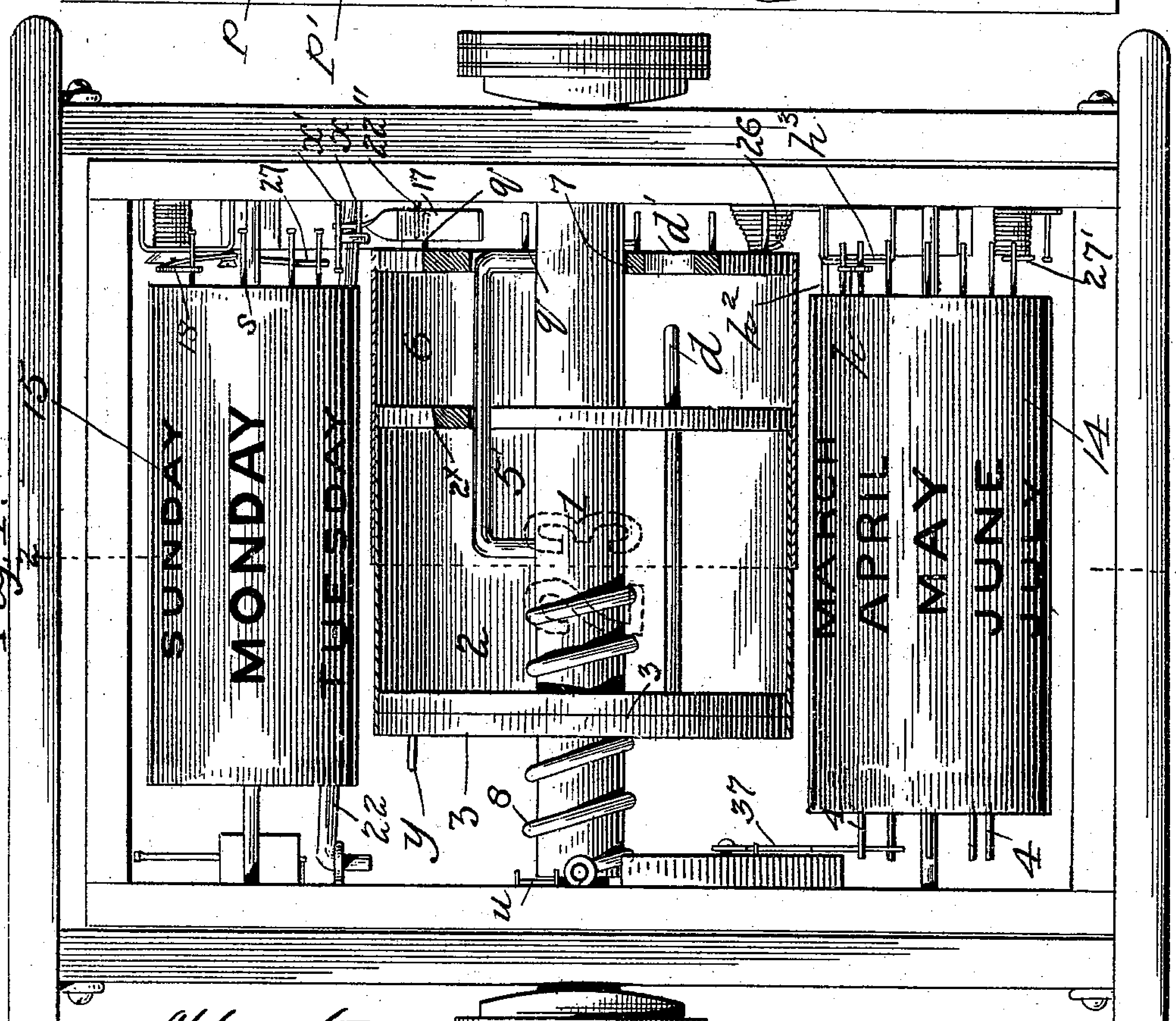


Fig. 1.



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F. L. Middleton

Inventor
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Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

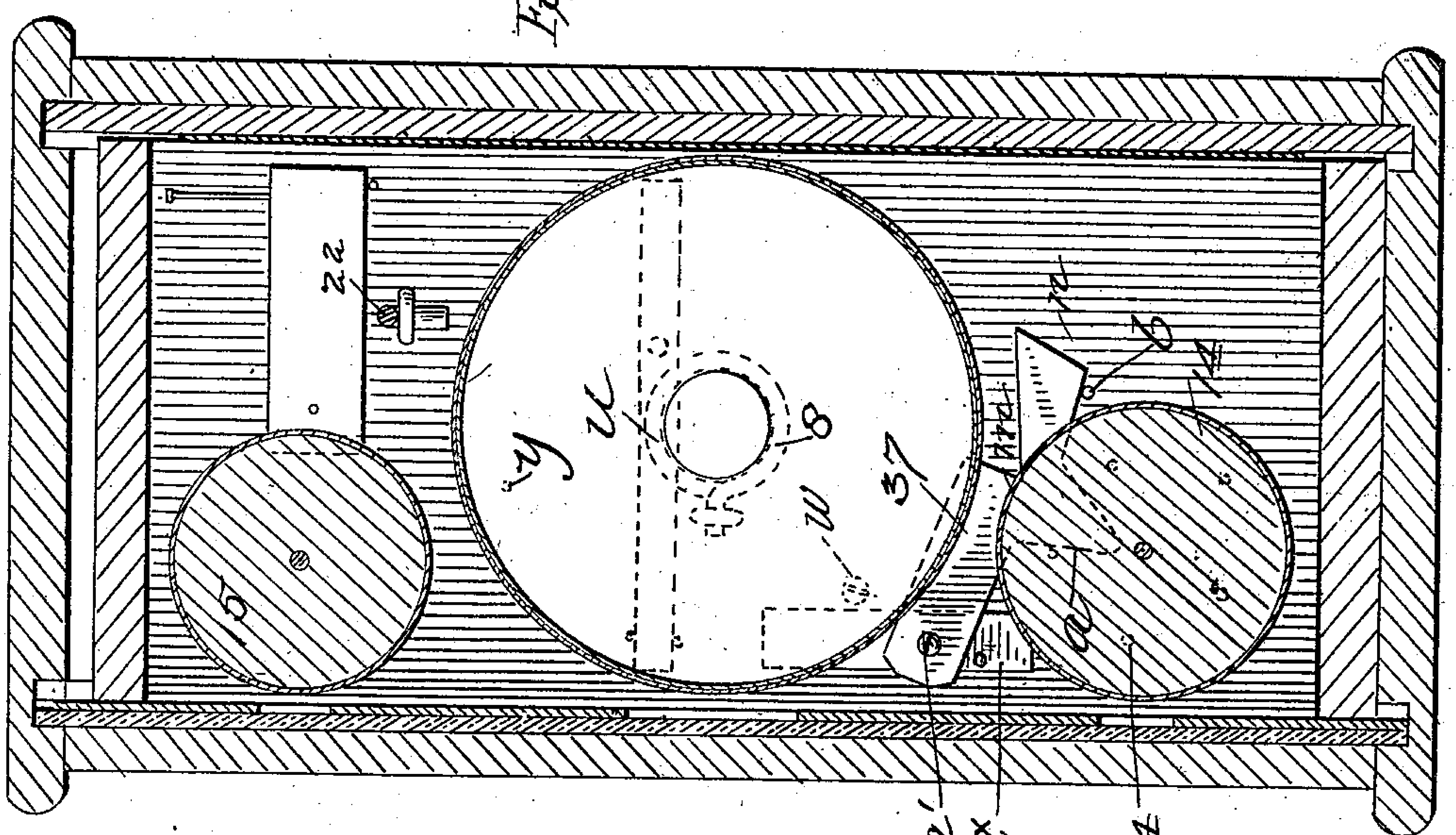
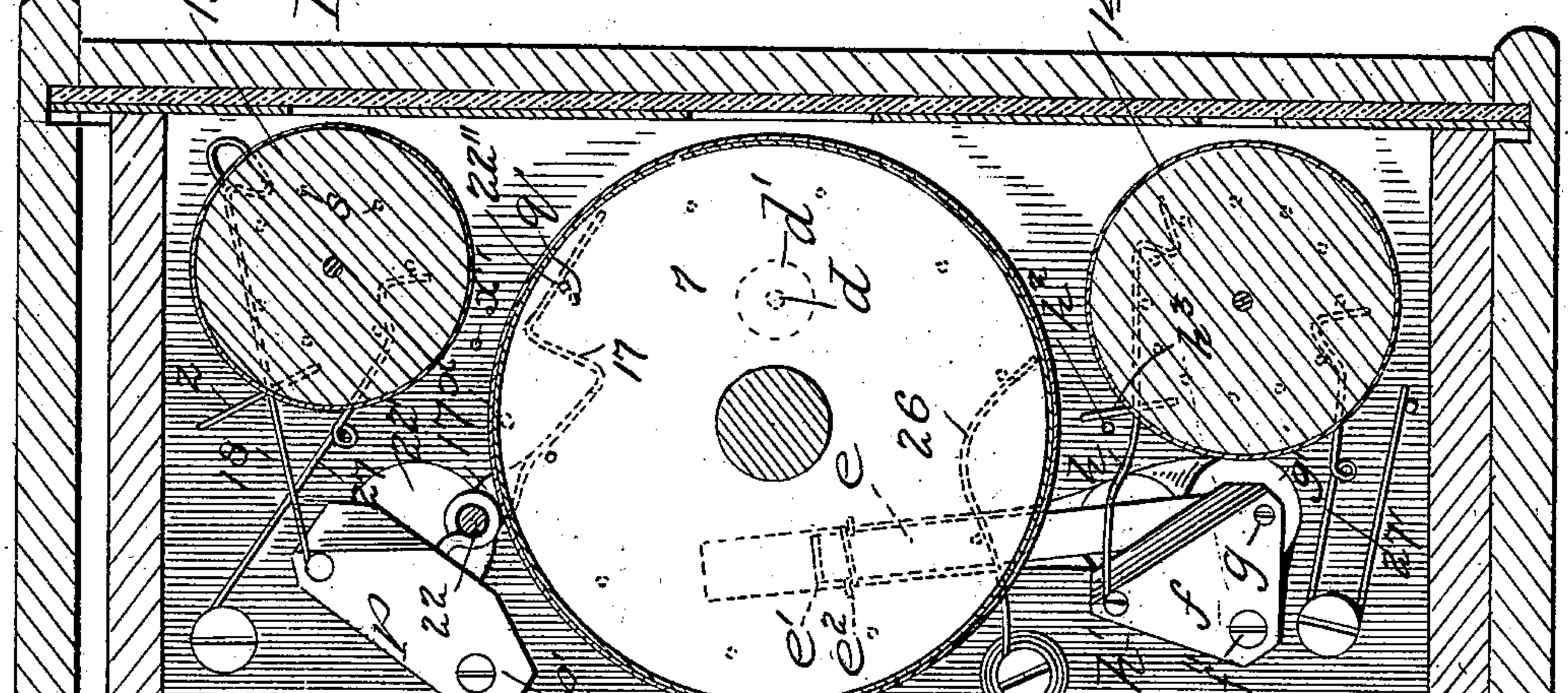


Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS HUMPHREY HOVENDEN, OF INGERSOLL, CANADA.

CALENDAR.

SPECIFICATION forming part of Letters Patent No. 551,638, dated December 17, 1895.

Application filed July 23, 1895. Serial No. 556,935. (No model.)

To all whom it may concern:

Be it known that I, THOMAS HUMPHREY HOVENDEN, a subject of the Queen of Great Britain, residing at Ingersoll, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Calendars, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention, herein particularly set forth, is an improvement upon the perpetual calendar shown in Letters Patent of the United States Nos. 254,014 and 254,015, granted me in 1882. In these improvements I have sought to change the arrangement of the record on the face of the calendar to make it correspond with the more common style of calendar, which change involved change in the mechanisms. I have also at the same time simplified the mechanism, and lessened the cost of manufacture.

I have illustrated my invention in the accompanying drawings, which show my improvements in their relation to and in connection with the old parts and general construction adopted from my said patents.

In the drawings, Figure 1 is a front view with the front plate removed. Fig. 2 is a section on line 2 2 of Fig. 1 looking toward the right. Fig. 3 is a section on said line looking toward the left. Fig. 4 is a face view of right-hand supporting-board. The shells of the telescoping cylinders are shown in section in this view and the right-hand heads of these cylinders are represented as broken away in order to illustrate the splined connection.

The case containing the mechanism and parts consists of a rectangular box or frame, made preferably with sides and top and bottom of thin boards, and back of sheet metal adapted to give a staying effect to it. On the front of it is placed a suitably-ornamented frontispiece, preferably made of pasteboard, having apertures through which are seen the day of the week, figures representing the day of the month, and the month, one above the other in the order named. This case is inclosed in or covered by an outer case of any design and ornamentation or material desired, and can be adapted to either stand on desk or table, &c., or hang on nail or hook. This outer case has a glass front through which the frontispiece with the apertures can be seen.

The calendar is wholly operated by turning by the hand a knob at either side of the case, these knobs being fastened to the ends of a central shaft 1, preferably made of wood, on which the cylinders 6 and 2 carrying the set of figures representing the days of the month are mounted, a knob being so placed at each side of the case for convenience and symmetry, although only one is necessary to operate the calendar.

The method of arrangement by which the series of figures from "0" to "31" representing zero and the days of the month is produced is the same as that shown in my said patents, and fully described in my said Patent No. 254,015, and consists of a combination of two cylinders 6 and 2 of pasteboard or other thin material, their heads being preferably made of thin boards, one cylinder 6 having a single head 7 at its right-hand end, with a central hole, by which it is supported on the shaft 1, being also fixed to it. This cylinder 6, which is called the "units-cylinder," is so placed on the shaft that its left-hand edge is at the middle of the width of the case and of the aperture in the frontispiece, and close to this edge it has on it a series of figures "0," "1," "2," &c., to "9," adapted to act as units-figures and as unital figures to a series of figures spirally arranged on the other cylinder 2, called the "decimal-cylinder," which act as decimal-figures to these unit-figures. This decimal-cylinder 2 is splined by its right-hand head $2^{\times}$ at 5 to the shaft, so as to be revolved by it in unison with the unit-cylinder, but to be capable of lateral movement on the shaft, and telescopes into the unit-cylinder. It is extended from the unit-cylinder, when the shaft is turned to advance the figures, by its left-hand head 3 being engaged by and traversing a screw 8 formed preferably by a wire coiled around the shaft and fixed to the side board of the case, the pitch of said screw being the same as that of the row of figures on the cylinder—it being understood that each figure is placed so as to appear in a vertical position at the aperture—thus bringing to view alongside the unit-figures on the unit-cylinder, as they appear at the aperture, the necessary and proper figures to produce in unison with these unit-figures the series of figures from "0" to "31," the aperture only allowing of the one decimal-figure acting with the unit-figure to be seen in company with it, and during its first revolution only blanks, until the "0" on the unit-cylinder comes to view after one revolution, when the first figure "1" of the set of "1's" appears, forming in combination with it the "10." Successive "1's" then appear until the unit-figure "0" comes around again, when the first "2" of the set of "2's" appears, forming the "20," and so on. On turning the shaft 1 in the reverse or backward direction, the figures appear in reverse order and the decimal-cylinder telescopes into the unit-cylinder, leaving at the last only sufficient of it in view to fill properly its half of the aperture. This combination and the mechanism of it are fully described in my said Patent No. 254,015. The shaft is secured from lateral movement by the side of a metal bar u, which is fixed to the left-hand side board, projecting into a circumferential groove formed in it. The head of the unit-cylinder 7 has inserted in it a set of ten pins q, in a circular row corresponding to its ten figures, and the head and consequently cylinders and shaft are centered and held in proper position to show the figures accurately at their aperture by a wire-spring detent 26 with a bow-shaped end acting on or between any two of the pins q as they revolve to bring them to, and hold them in the proper position, said pins riding over the spring when the shaft is revolved in either direction and depressing it in passing over it, making it revolve in a step-by-step manner corresponding to each figure. The revolution of the shaft and cylinders is limited, by stops hereinafter described, to that extent necessary to show the series of figures from "0" to "31," but is further limited in its forward revolution by a variable stop, hereinafter described, acting to stop it at "30" and at "29" when months having these numbers of days are presented to view.

The cylinders carrying the seven days of the week and the twelve months, respectively, and marked 15 and 14, are preferably made of solid wood with central shafts of wire. They are supported by holes in the side boards, forming bearings in which they revolve. These cylinders have inserted in their right-hand ends a set of seven and a set of twelve pins, respectively, corresponding to the words they bear, set in a circular row in each, respectively. They are centered and held in proper position at each step as they are revolved in their step-by-step revolution, so as always to show their words accurately at their apertures, by spring-pawls 27 27′, made of wire, with Λ-shaped ends, adapted to act on the pins in the same manner as the spring acting on the unit-cylinder pins already described. These cylinders are suitably revolved by connecting mechanism operated by the revolution of the day-of-the-month cylinders. That operating the week-day cylinder is somewhat similar to, but not identical with, that for the same purpose shown in my said patents. A pawl, called a "push-pawl" 17, is held pivotally on a rod 22 called a "swinging rod," having a loose support at its other end in the left-hand side board where it is held in place by its bent end being hooked in an eye fixed therein. The end of this rod supporting the push-pawl projects into a large hole or recess 22′ in the side board, and when in its normal position rests on the lower side of it. The outer leg of the push-pawl 17 is supported by and slides on a pin 22″ set in the side board slightly above the path of the pins in the unit-cylinder head, and the lower projection of the pawl rests between any two of these pins of the unit-cylinder when it and the unit-cylinder are in their normal positions. There is also connected with the swinging rod a block p pivoted at p' to the side board, being connected to and moved by the rod 22, which passes through an eye formed in or fixed to the block. At the upper part of the block is pivotally connected to it a wire pawl 18 adapted to act on the pins s of the week-day cylinder and on which its outer portion rests. The action of these parts is as follows: As the shaft is revolved in a forward direction to advance the figures, the pin then in front of the push-pawl strikes it and forces it backward and upward until it passes under its lowest corner, when the pawl and everything connected with it fall back to their original positions by their weight, chiefly that of the rod. When the rod rises by the action of the pin on the pawl it swings the block on its pivot, and by the bell-crank action of the block pulls on the pawl 18 acting on the week-day-cylinder pins s, acting to revolve that cylinder one step to show the next day, this taking place simultaneously with and as the new day of the month also appears. When the rod falls back to its normal position, the week-day pawl 18 also goes back, riding over the next pin and falling to place ready for action on it. This action only takes place when the shaft is revolved forward to advance the figures. On turning it backward, the swinging rod is not caused to rise, as the push-pawl then is only flopped by the pins as they pass under it. Pins x and x' are set in the side board to prevent the push-pawl from getting out of its place if the calendar should be turned upside down, &c. The pawl 18 acting on the week-day cylinder is prevented from getting out of its place under similar circumstances by an upward bend formed in the end of it, adapted to strike against the top board, and by a wire staple z placed in the side board beside it.

The mechanism for changing the month is as follows: A metal bar e having a lip or offset e' at its upper end is supported by and slides in a wire loop e^2 fixed in the side board so that the bar is below the level of the board and in a slot or recess formed in it, the offset alone projecting outwardly. At its lower end it is pivoted by a pin or screw g passing through a hole in it and fixed to a triangular block f, which is itself pivoted to the side board at f''. The pin or screw g projects through its hole in the bar into a large hole or recess g' in the side board. At the upper corner of the block at h' a wire pawl h is connected to it pivotally, adapted to act on the pins of the month-cylinder, resting on them and acting on them in the same manner as the week-day pawl acts on that cylinder already described. The movement of these parts is limited by the size from top to bottom of the hole g' in the side board, the bar when lifted up being stopped by the pin g to which it is pivoted striking the upper side of the hole, and when it drops, as it does by its own gravity, by the lower side. The action of these parts is as follows: As the shaft is turned backward, and at its last revolution, as the figures pass from "1" to "0" a pin or rod d, which is fixed in the decimal-cylinder and projects through a hole d' having large clearance for it in the unit-cylinder head 7, engages with the offset e' of the bar e and lifts it to its uppermost limit, coming to a stop with it as the figure "0" appears, and the action of lifting the bar, being transmitted through the bell-crank formed by the block f to the pawl h acting on the month-cylinder pins, revolves that cylinder one step to show the next month. On advancing the figures from "0" the bar and the parts connected with it fall back to their original positions, with the month-pawl ready for action on the next pin. This pawl h is prevented from getting out of its place if the calendar should be turned upside down, &c., by a pin h^2 inserted in the side board acting on it in connection with a certain bend made in the pawl at its middle portion and by a wire staple h^3 also inserted in the side board.

The forward revolution of the day-of-the-month cylinder is stopped at the proper number of days for each particular month by the following means: A latch 37 formed of sheet metal and having shoulders m and n and a lower projection a is pivoted at a' to a block $a^{\times}$ fixed to the left-hand side board. Its projection a is acted on by pins 4 inserted in the end of the month-cylinder. There are five of these pins, four of them being in a circular row and inserted in relation to, and representing, the four thirty-day months. The other pin is inserted in a position farther from the center of the cylinder and in relation to, and representing, the month of "February." These pins act on the latch 37 as the cylinder is revolved to raise and hold it up so that either one or other of the shoulders m and n is brought in the path, in its last revolution forward, of a pin y inserted in the head of the decimal-cylinder, the shoulder n being in the path of the pin when "February" is in view, its pin holding the latch in its highest position and stopping the cylinders from further revolution forward at "29," this being the maximum for February. Any one of the other four pins holds up the latch in a lower position, bringing the shoulder m in the path of the pin y and stopping the cylinders at "30." For the seven thirty-one-day months there are no pins to act on the latch, which then falls to its lowest position, resting on a pin b set in the side board, so that it is entirely out of the path of the stopping-pin y, which is then stopped by the head of a screw w set in the side board when the figures are at "31."

It will be readily seen that by the means shown the whole calendar is very simply operated in every respect, both to advance it day by day in proper order and to set it to any date desired, by either one of the knobs. Turning the knob one step forward always advances the day of the week and the day of the month one day. On arriving at the end of the month it is automatically stopped at the right number of days for each month. Then on turning back until stopped at "0" and advancing to "1" the whole record is in correct order. In the month of "February" it is designed to be stopped at "29," the number of days in that month in leap-year. When it is not leap-year it should be turned back at 28 and not advanced to 29; but if that mistake should be made it can be easily and quickly set right again after the month is changed by turning to and fro between "1" and "2" until the right day of the week appears with the "1." It can be easily and quickly set right at any time if it has been disturbed by being meddled with, or if out of date, or set to any date desired, in the following manner: First, set the month, if that is wrong, by turning back to "0" and then to and fro between "0" and "1" until the month desired appears. Then turn forward to the day of the month desired, and then to and fro with the next one until both the day of the week and the day of the month are right. When once set right, if it is properly operated by turning one step forward each day, and turning it back until stopped at "0" at the beginning of each month, as explained, it will always be right for any length of time.

I claim—

1. In combination with the telescoping unit and decimal cylinders on the shaft, a separate month cylinder a pawl for operating the same, a pin carried by the decimal cylinder and arranged to advance through the head of the unit cylinder, an offset arranged to be moved by the said pin and connections between said offset and the pawl which moves the month cylinder, substantially as described.

2. In combination with the telescoping unit and decimal cylinders and the month cylinder and with mechanism for moving the month cylinder, operated from the decimal cylinder, a variable stop latch regulated by pins on the month cylinder and arranged to oppose a pin on the decimal cylinder, substantially as described.

3. In combination the main shaft, a unit cylinder fixed thereon, a decimal cylinder movable longitudinally of the shaft telescoping with the unit cylinder, and both bearing the month day numbers, and turning with said shaft, a month cylinder separate therefrom, a pin on one end of the decimal cylinder, arranged to operate the turning mechanism for the month cylinder and a pin on the other end of said decimal cylinder arranged to act as a stop for the said cylinders, substantially as described.

4. In combination with the unit and decimal cylinders, having pins on the end of the unit cylinder, a separate week day cylinder having similar pins, a push pawl operated by the pins of the unit cylinder and a pawl operated by the push pawl, to impel the week day cylinder, substantially as described.

5. In combination in a calendar, the casing, the shaft therein, the unit and decimal cylinders carrying the month day numbers and arranged on the said shaft and adapted to telescope, the month and week day cylinders arranged on separate shafts and connections from said telescoping decimal and unit cylinders respectively to the month and week day cylinders, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS HUMPHREY HOVENDEN.

Witnesses:
JAMES MCKAY,
BESSIE PETRIE.