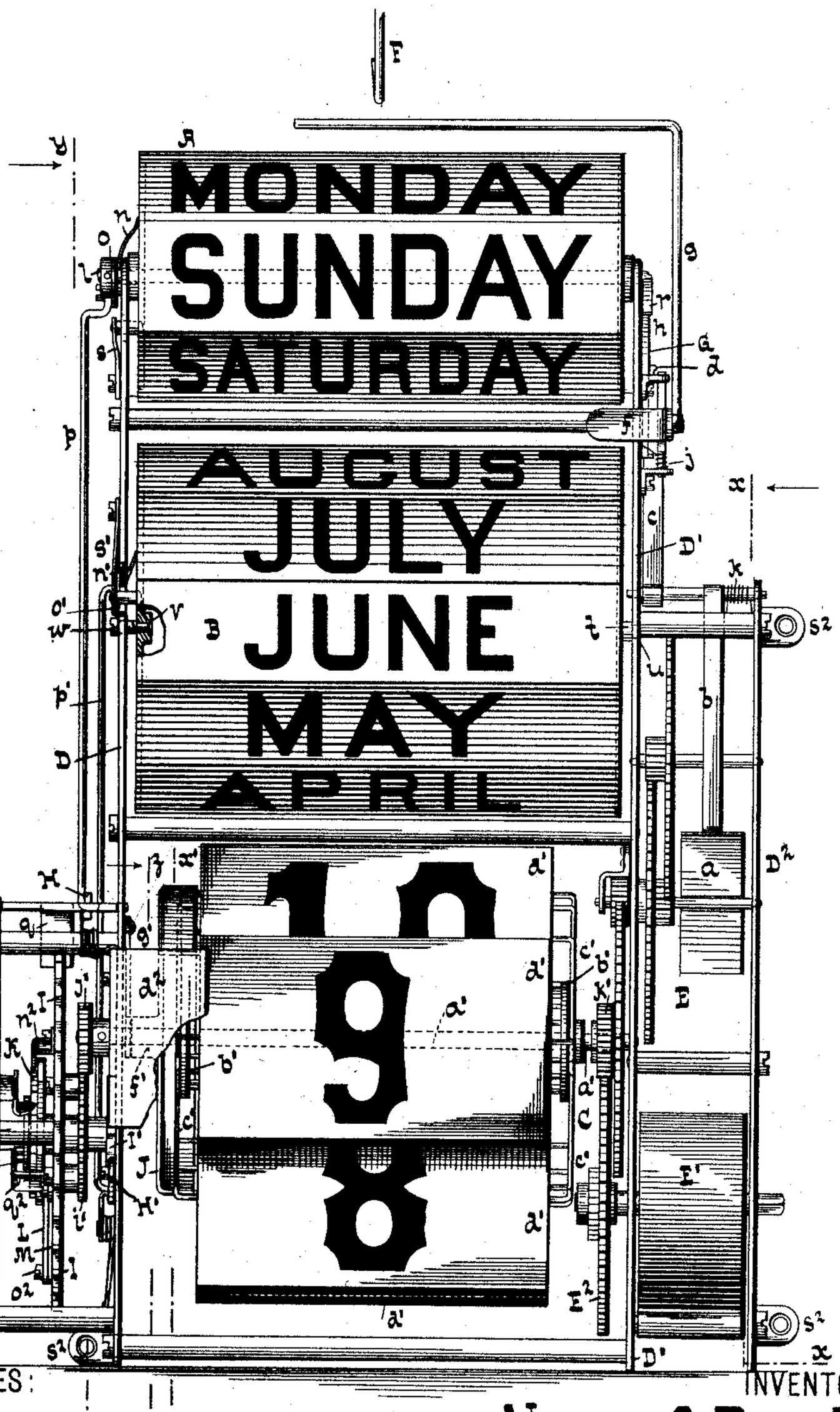
(No Model.) 4 Sheets—Sheet 1.

H. S. PRENTISS.

CALENDAR.

No. 428,318. Patented May 20, 1890.

Fig. 1.



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his ATTORNEY

(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

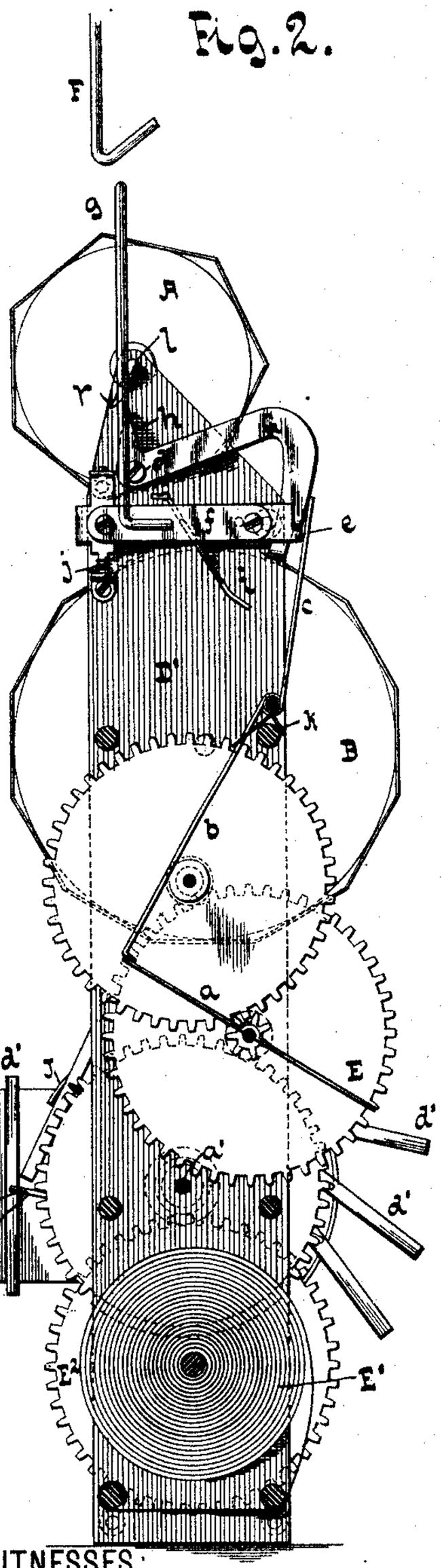
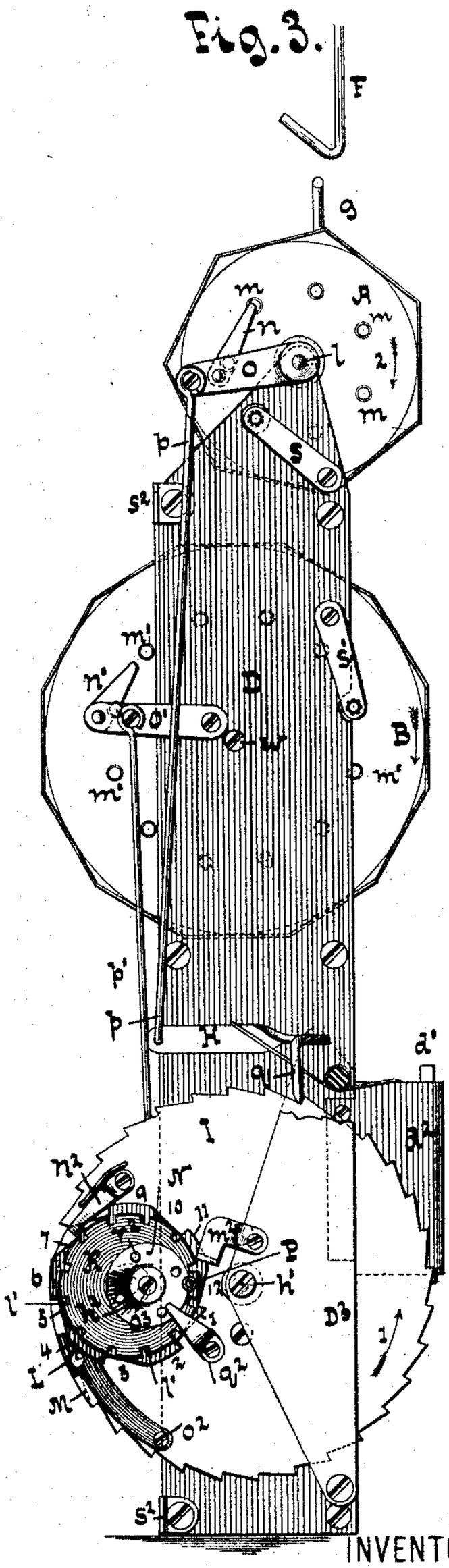


Fig. 3.



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(No Model.) 4 Sheets—Sheet 3.

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Fig. 4.

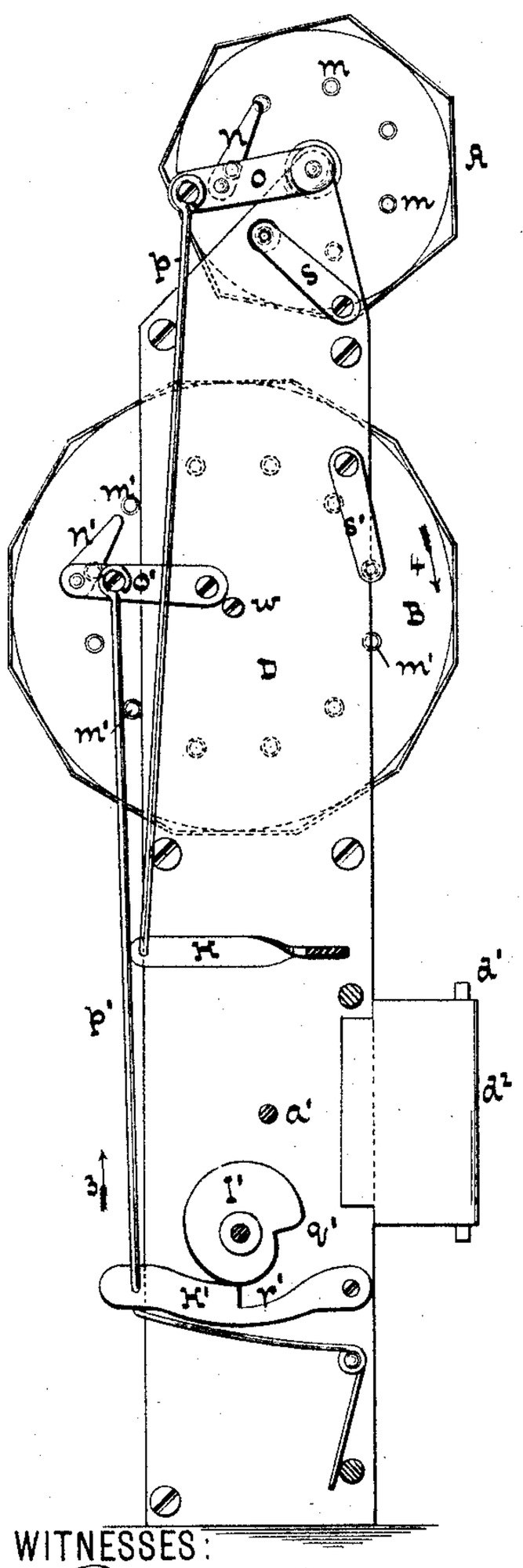


Fig. 5.

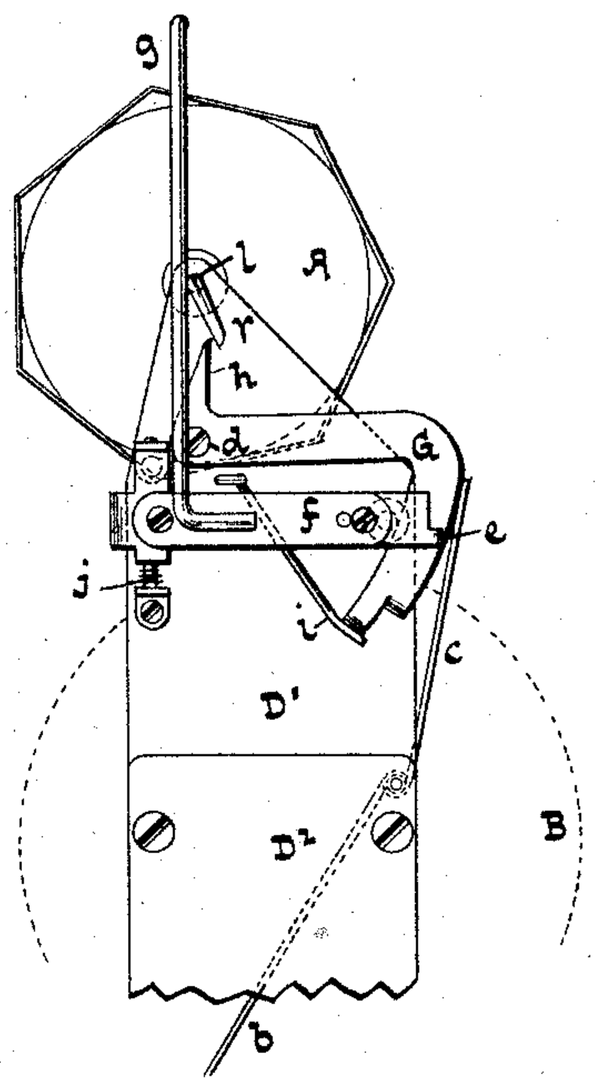
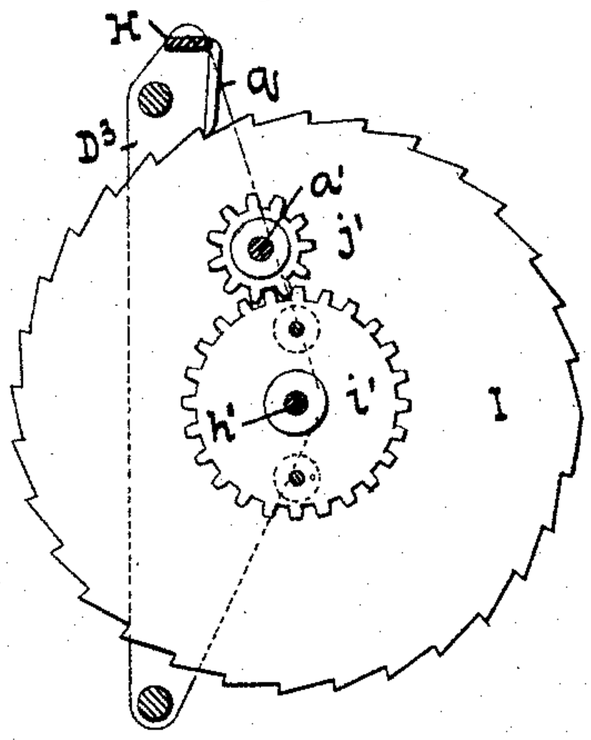


Fig. 6.



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CALENDAR.

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Fig. 7.

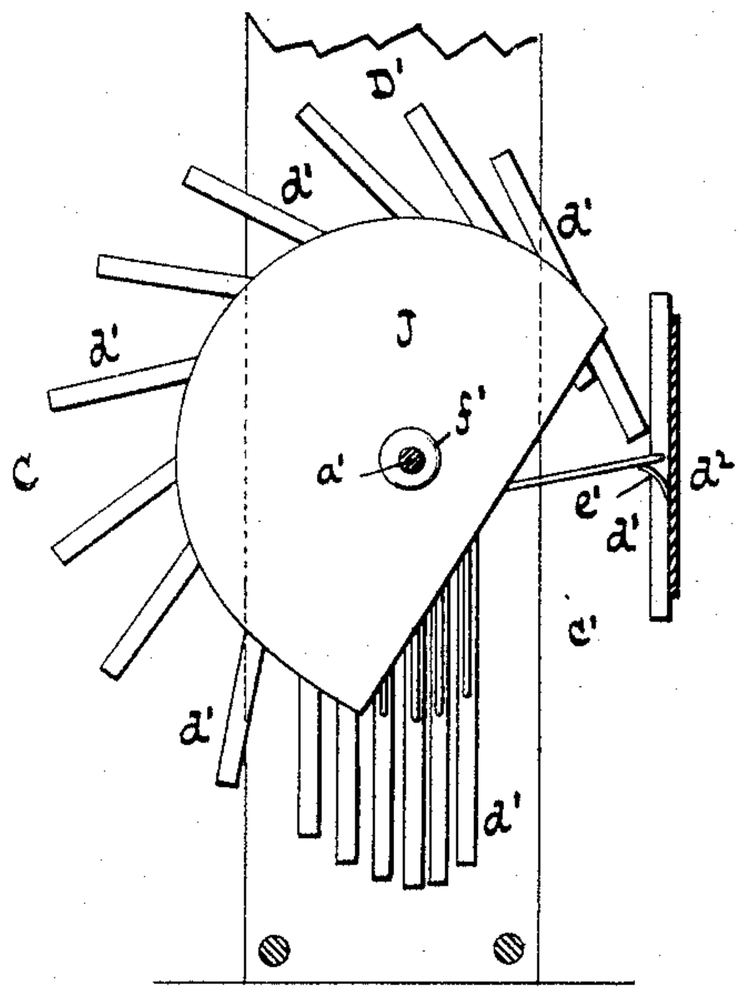


Fig. 8.

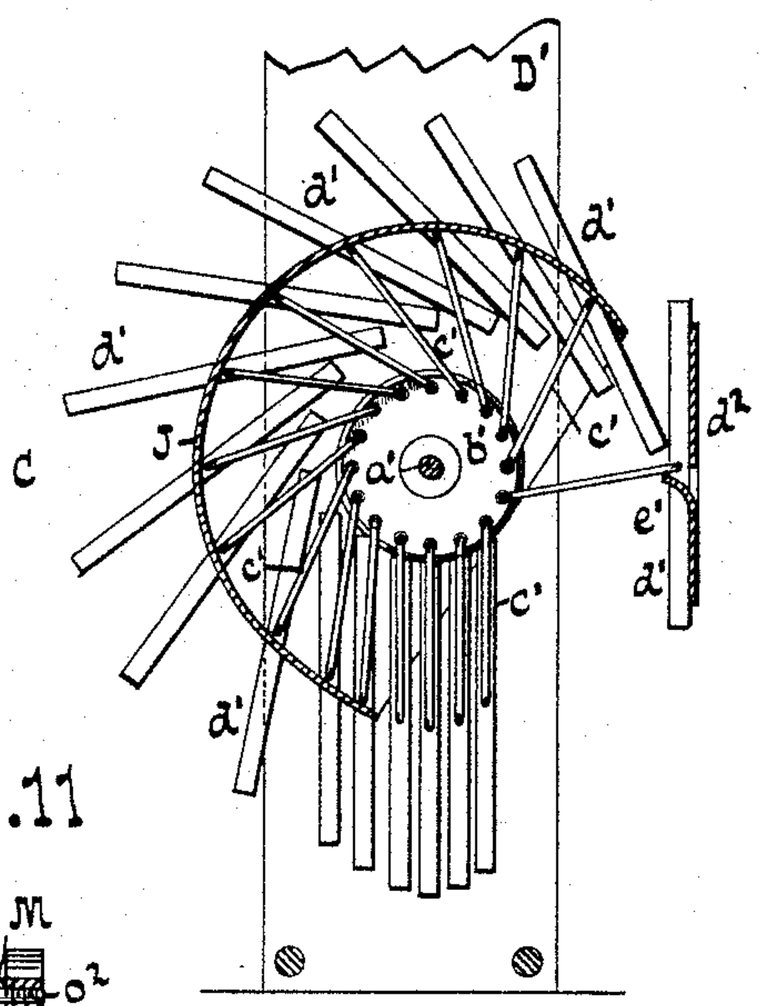


Fig. 9.

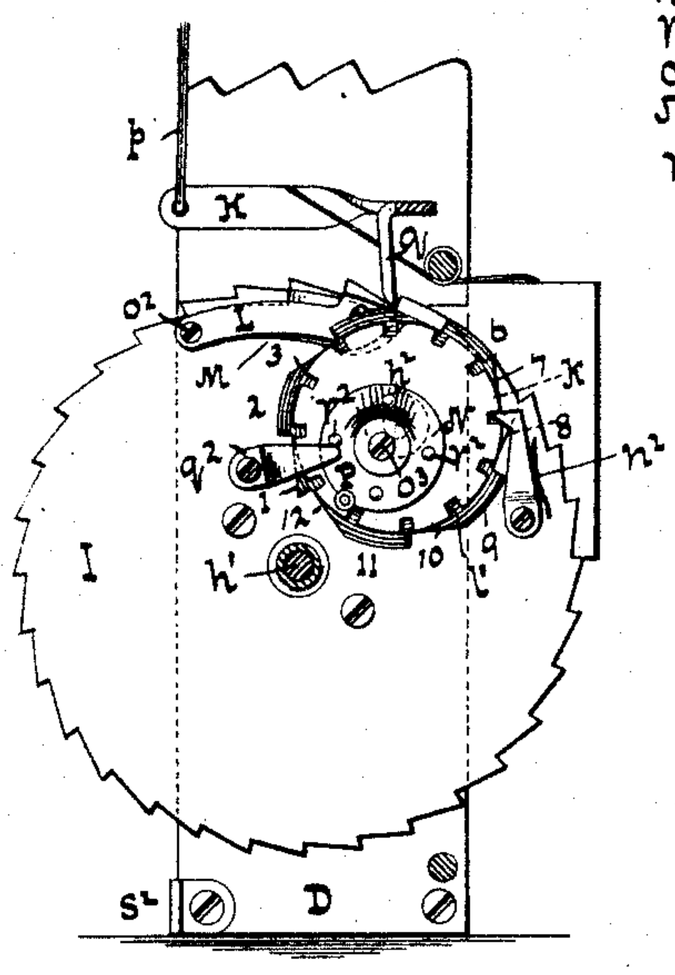


Fig. 11

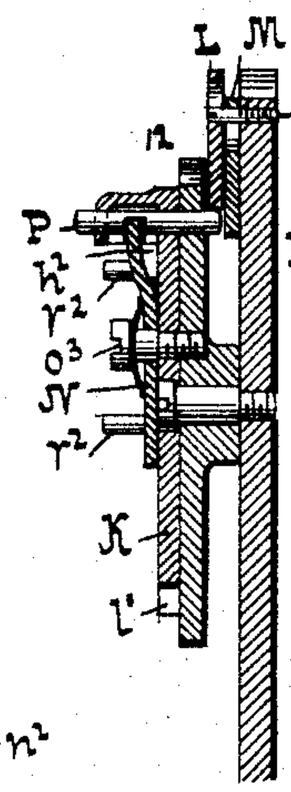
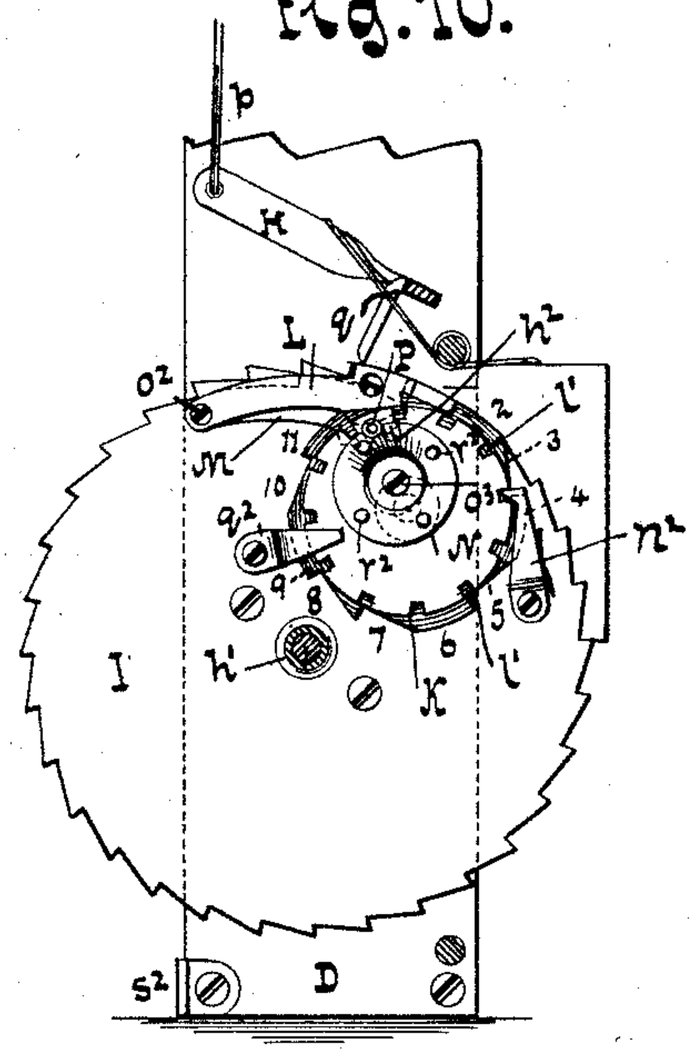


Fig. 10.



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UNITED STATES PATENT OFFICE.

HENRY S. PRENTISS, OF NEW YORK, N. Y.

CALENDAR.

SPECIFICATION forming part of Letters Patent No. 428,318, dated May 20, 1890.

Application filed September 16, 1889. Serial No. 324,037. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. PRENTISS, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Calendars, of which the following is a specification.

My invention has reference to calendars of that class which are adapted to be operated either directly or indirectly by a clock-movement to indicate at all times the day of the week, the day of the month, and the month, provisions being made for all the irregularities of our calendar.

More particularly my invention relates to improvements in the devices described in Letters Patent No. 360,725, dated April 5, 1887, its object being to provide more accurate and reliable means for rotating the various cylinders and for meeting the irregularities in the calendar, all of which is more fully pointed out in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of a calendar constructed according to my invention. Fig. 2 is a vertical section thereof in the plane *x x*, Fig. 1. Fig. 3 is a sectional side elevation of the side opposite to that shown in Fig. 2. Fig. 4 is a vertical section in the plane *y y*, Fig. 1. Fig. 5 is a side elevation showing the parts in positions differing from those shown in Fig. 2. Fig. 6 is a vertical section in the plane *y y*, Fig. 1, looking in a direction opposite to that indicated by the arrow. Fig. 7 is a vertical section in the plane *z z*, Fig. 1. Fig. 8 is a similar section in the plane *x' x'*, Fig. 1. Fig. 9 is a sectional elevation of the day and month wheels. Fig. 10 is a similar view showing the parts in different relative positions. Fig. 11 is a transverse section, on a larger scale than the preceding figures, taken through the day and month wheels.

Similar letters indicate corresponding parts.

In the drawings, referring at present to Figs. 1, 2 and 3, the letter A designates the cylinder carrying the names which indicate the days of the week, B the similar month-cylinder, and C the device for holding and displaying the cards or plates indicating the days of the month, all supported in suitable side frames D D'.

E is the spring-motor, which operates the various parts of the calendar through suitable connections E', being the mainspring thereof. The spring-motor is normally held out of action and is released once in every twenty-four hours—say at midnight—to actuate the various parts to indicate the change in date and day, such release being primarily effected either by a suitable mechanical device—such as F—actuated by the clock-movement or by an electric circuit-closer and an electro-magnet and connections. The clock-movement or other primary device for effecting the release of the calendar-movement I have not illustrated, as my invention has no bearing upon the same.

The motor E is normally held out of action by a stop which engages with the regulating-fan *a* of the same, or with any other part of the motor where the tension is not excessive. This stop I have shown in the form of a lever *b c*, pivoted to the side frame D' and to a supplementary frame D³, the upper arm *c* of said lever being in contact with a cam-surface on the end of a lever G, pivoted at *d* to the side frame E'. The cam-lever G is held in the position shown in Fig. 1 by a stop *e* on a locking-arm *f*, which latter can turn about suitable bearings in brackets secured to the side frame. The releasing device F, when actuated by the clock, engages with a rod *g*, projecting from the arm *f*, and swings the same outward upon its pivots, thereby releasing the cam-lever G, which falls from its inherent weight. (See Fig. 5.) The stop-lever *b c*, vibrated by the fall of the cam-lever G, releases the fan, whereupon the motor is free to act. A suitable spring-stop, as *i*, is provided for limiting the downward movement of the lever G, also a spring, as *j*, for returning the arm *f* to its normal position when released from the device F. A spring *k* holds the arm *c* of the stop-lever *b c* continually in contact with the cam-lever G.

The day-of-the-week cylinder A is mounted upon and can turn about a horizontal shaft *l*, having bearings in the side frames D D', and one head of said cylinder is provided with a series of notches or openings *m*—one for each

side of the cylinder Figs. 3 and 4—arranged concentric with the shaft *l*. These notches are successively engaged to rotate the cylinder by a pawl *n*, carried by an arm *o*, rigidly mounted upon the projecting end of the shaft *l* of the cylinder A. The outer end of the arm *o* is connected by means of a rod *p* with a spring-pressed lever H, the downwardly-projecting arm *q* of which engages with the teeth of the day-wheel I and is vibrated by the rotation of the same. The opposite end of the shaft *l* of cylinder A is provided with a downwardly-projecting finger *r*, which is adapted to engage with the vertical arm *h* of the cam-lever G.

The operation of the calendar in advancing the cylinder A through one-seventh of a revolution each day is as follows: The cam-lever G having been released, and having caused the stop-lever *b c* to release the motor, the latter rotates the day-wheel I in the direction of arrow 1, Fig. 3, and the corresponding tooth of said wheel engages the lever H to turn the same, thereby causing the pawl *n* to advance the cylinder A through one-seventh of a revolution in the direction of arrow 2, Fig. 3. On the completion of this portion of a revolution the lever H is released from the tooth and falls back against the next succeeding tooth, or to its normal position, thereby drawing the pawl *n* backward and into the proper position to engage with the next succeeding notch or opening *m*. In the rotation of the shaft *l* in the direction of arrow 2, Fig. 3, the finger *r* on the end of the same is turned to the position shown in Fig. 5. During the movement of the finger to this latter position it necessarily must engage with the arm *h* of the lever G, and in so doing turns the latter about its pivot *d*. The elastic or spring stop *i* permits such a movement of the lever G, and then returns the same to the position shown in Fig. 5. During the retrograde movement of the lever H the finger *r* again engages with the cam-lever G from the opposite side (see Fig. 5) and returns it to its normal position Fig. 2, thereby arresting the movement of the motor. A suitable spring-lock, as *s*, is provided, which snaps into the respective opening or notch *m* as it is brought in line with said lock, which prevents the position of the cylinder A from being disturbed by the retrograde movement of the pawl *n*.

It will be seen that by my present mechanism the forward movement of the cylinder A is a gradual one, as it receives this motion from the day-wheel I. Consequently the danger of turning the cylinder too far, owing to the momentum obtained, is avoided. It is evident that the notches or openings *m* in the head of the cylinder could be replaced by projections to the same end.

The month-cylinder B is arranged to turn about bearings in the side frames D D′, and in order that the same can be readily inserted or removed I provide one head of the same with a journal *t*, which fits into a bearing *u* in the side frame D′, Fig. 1, and the other head with a hub having a bearing *v*, into which extends the end of a stud *w*, having a threaded portion passing through the side frame D. One head of the cylinder B, Fig. 4, as in the case of the cylinder A, is provided with a concentric series of notches or openings *m′*—one for each month—which notches or openings are successively engaged by a pawl *n′*, carried by an arm *o′*, pivoted to the frame D. The arm is connected by means of a rod *p′* with a spring-pressed lever H′, engaged by a cam I′, secured to the hub of the day-wheel I and participating in the rotation thereof. At the end of each month the nose *q′* of the cam is brought into a position opposite a notch *r′* in the lever H′, so that the latter gradually moves upward, whereby the pawl *n′* is caused to advance the cylinder B through one-twelfth of a revolution in the direction of arrow 3, Fig. 4. A suitable spring-lock *s′* is provided to prevent retrograde motion of the cylinder as the pawl is gradually drawn back to its normal position by the cam I′.

The device C, for displaying the cards which give the day of the month, consists of sixteen cards *d′ d′*, &c., and each card has a date upon each side, with the exception of one. Each card shows one side and the other alternately as it is brought to the front. Thus, there being sixteen cards, the card having 1 on one side has 17 upon the other, that having 2 on one side has 18 on the other, and so on, each card being reversed as it passes around the shaft or axis *a′* which carries it. The shaft or axis *a′* has two disks *b′ b′* arranged thereon at the proper distance apart. These disks have each sixteen holes, through which are passed the wires *c′ c′*, the ends of the latter being turned outward at right angles and then turned inward to form pivots, upon which the cards *d′ d′* are suspended at their centers. The front card *d′* is brought against a flat stop d^2 into a vertical position, and is held by a stop *e′*, engaging with the respective wire. At each release of the motor E a new card is brought against the stop d^2 by the rotation of the shaft or axis *a′*.

I will not enter further into the operation of the card-displaying device C, that being fully described in my prior patent.

In practice I have found that the movements of the cards are liable to be irregular, owing to the possibility of the cards becoming confused or entangled when the calendar is laid down. To avoid this, I make use of a guide J for the same, (see Figs. 1, 7, and 8,) which is best made in the form of an approximately semicircular plate or shell having its rim in engagement with the horizontal portions of the wires *c′ c′*, carrying the cards. The rim of the plate J is so formed as to positively guide the wires. The plate may be held rigid by any suitable means. In the drawings I have shown it provided with a hub *f′*, through which the shaft *a′* passes, while it

is held stationary by an adjustable arm g', attached to the side frame D, Fig. 1.

It now remains to describe the means for providing for the varying days of the month and the manner in which the extra day of February in leap-year is indicated.

The day-wheel I has upon its periphery thirty-one teeth and one blank, the use of the blank being necessitated by the fact that the sixteen cards d' d' used in the device for indicating the day of the month would present thirty-two sides. Consequently this side must be passed by every month. The day-wheel is mounted upon an arbor h', and connected with the shaft a' by gear-wheels i' j', the shaft a' being connected with the great wheel E^2 of the motor by a gear-wheel k'.

The month-wheel K is mounted upon the day-wheel I and eccentric with respect to the arbor h' of the same. It consists of two plates rigidly united or of one plate turned to have a step-like periphery. The outer plate is provided with twelve peripheral notches l', arranged equidistant apart. The inner plate is provided with recesses corresponding to the teeth of the day-wheel I, and with blank portions, all numbered from 1 to 12, the recesses representing the months having thirty-one days and the blanks those having but thirty days. The month-wheel is so arranged that its periphery is tangent with that of the day-wheel just above the blank of the latter. Consequently it will be readily understood that when one of the recesses in the month-wheel is directly opposite the corresponding tooth of the day-wheel thirty-one days will be indicated by the device displaying the cards. If, however, one of the blanks of the month-wheel is brought opposite the tooth of the day-wheel, but thirty days will be indicated, since such tooth will be virtually bridged over, and the lever H rides over a space corresponding to two teeth.

On the bridge or supplementary portion D^2 of the frame D is secured a pawl m^2, which is bent inwardly to engage at certain intervals with the notches l' of the month-wheel. Once every month as the month-wheel revolves about the arbor h' it comes into a position where pawl m^2 will engage a notch l', thereby advancing the month-wheel through one-twelfth of a rotation about its pivot. In Fig. 3 I have shown the month-wheel in a position where it has just been turned by the pawl. A suitable spring-detent n^2, engaging with the notches of the month-wheel, prevents it from being inadvertently moved. The month-wheel thus provides for the varying days of all the months with the exception of February, for which latter I provide as follows:

Near the periphery of the day-wheel I are located two movable teeth L and M, which are preferably arranged to swing about a common pivot o^2, and when in coincidence with the periphery of the day-wheel they bridge over two successive teeth of the same, said teeth being those next following the blank space of said day-wheel. When in this position, the month will have but twenty-eight days, corresponding to February for three years; but when only the tooth L is coincident with the periphery of the day-wheel the month will have twenty-nine days, corresponding to February for leap-year. The teeth are arranged one above the other, and to hold either one or both of the same coincident with the periphery of the day-wheel I make use of the following means: On the month-wheel K is eccentrically mounted to turn about a central pivot o^3 a small wheel N, which engages with a pin or stop P, passing through the month-wheel K and having suitable guidance therein. (See Fig. 11 especially.) The periphery of the wheel N is provided with a raised portion or cam-surface h^2, and whenever said surface is opposite the pin or stop P the latter is drawn outward to such a position that one of the teeth L M is retained thereby in its outer position, while the other tooth can fall inward. The wheel N is turned through a quarter of a revolution each year by a pawl q^2, secured rigidly to the day-wheel and adapted to engage with pins r^2 on the said wheel. For three years, consequently, the pin or stop P is held depressed, and both teeth L M are held in their outer positions, corresponding to February of the three years, but in the fourth year the pin is elevated to permit one tooth to pass corresponding to February in leap-year.

It will be observed that in the month of February in each year the pin or stop P is opposite the teeth L M and is adapted to engage one or both of the same. In the remaining months of the year the pin or stop is out of the range of the said teeth, and consequently both teeth can fall inward.

The side frames D D′ D^2 D^3 are provided with suitable brackets, as s^2, for fastening the same to the case, the whole being so constructed that the calendar can be completely set up before its insertion into the case.

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

1. In a calendar, the combination of a motor, a positive stop for holding the motor out of action, a lever engaging with said stop, a locking device for the same, and means for actuating the locking device to release the lever, substantially as described.

2. In a calendar, the combination of a motor, a stop for holding the motor out of action, a gravitating cam-lever engaging with said stop, a hinged locking-arm for holding the cam-lever in an elevated position, and means for turning the locking-arm about its hinge to release the cam-lever, substantially as described.

3. In a calendar, the combination of a motor, a lever positively engaging with the motor to hold the same out of action, a lever engaging with the stop-lever, a hinged locking-arm for holding the cam-lever in an elevated po-

sition, a rod projecting from the said locking-arm, and means for vibrating the same, substantially as described.

4. The combination, with the motor, the day-wheel, and the day-of-the-week cylinder mounted loosely upon its shaft, of a stop for holding the motor out of action, a lever engaging with said stop, a lock for said lever, a releasing device, a pawl-bearing arm secured to the shaft of the cylinder and engaging with the cylinder, a lever engaging with the day-wheel and connected with the pawl-bearing arm, and a finger on the shaft, adapted to engage with the lever G, substantially as described.

5. The combination, with the rotary cylinder A, of a pawl bearing arm engaging with said cylinder, as described, a toothed wheel I, and a lever engaging with the latter and connected with the pawl-bearing arm, whereby the said wheel actuates the cylinder during its rotation to gradually turn the same, substantially as described.

6. In a calendar, a cylinder having one head provided with a series of openings or notches, and a spring-pawl adapted to engage the same to rotate the cylinder, in combination with a lock engaging the openings, substantially as described.

7. In a calendar, a day-wheel, a month-wheel eccentrically mounted with respect to the former, and a stationary pawl engaging with the month-wheel, substantially as described.

8. In a calendar, a day-wheel, a month-wheel eccentrically mounted upon the day-wheel and provided with toothed and notched peripheries, and a stationary pawl engaging the notched periphery, substantially as described.

9. In a calendar, a day-wheel, a month-wheel eccentrically mounted upon the former and provided with teeth and notches, as described; a stationary pawl engaging with the notches, and a detent carried by the day-wheel and engaging the month-wheel, substantially as described.

10. The combination, with the rotary day-wheel and the month-wheel carried thereby, of a stationary pawl engaging the month-wheel, a cam actuating the month-cylinder through suitable mechanism, and a lever engaging the teeth of the day-wheel and actuating the day-cylinder through suitable mechanism, substantially as described.

11. In a calendar, the toothed day-wheel, movable teeth located near the periphery of the same, and a device for holding said teeth rigid at certain intervals, substantially as described.

12. In a calendar, the combination of the day-wheel, the movable teeth located near the periphery of the same, and a stop actuated periodically to retain one or both teeth coincident with the teeth of the day-wheel, substantially as described.

13. In a calendar, the combination of the day-wheel, the movable teeth L M, the stop P, the wheel N, engaging with the stop and actuating the same, and means for rotating the wheel, substantially as described.

14. In a calendar, the combination of the day-wheel, the pivoted teeth L M, the stop P, and the wheel N, all combined and operating substantially as described.

15. In a calendar, the combination of the day-wheel, the month-wheel, the movable teeth L M, the stop P, carried by the month-wheel, the February-wheel mounted on the month-wheel and engaging the stop and provided with a raised portion, and means for rotating the said wheel, substantially as described.

16. The teeth L M, arranged upon the day-wheel coincident with two consecutive teeth thereof and adapted to bridge over said teeth at determined intervals, substantially as described.

17. In combination with the card-displaying device C, a rim engaging and guiding the wires or arms, substantially as described.

18. A shaft, a series of cards or plates, arms carried by said shaft, to which said cards or plates are pivoted, a guide for the arms, and means for revolving the shaft, substantially as described.

19. A shaft, a series of cards or plates, arms carried by said shaft, to which the cards or plates are pivoted, a stationary guide for the arms, and means for revolving the shaft, substantially as described.

20. In a calendar, the combination of the pivoted lever G, the elastic stop *i* for the same, and the finger *r'*, engaging the lever, substantially as and for the purpose set forth.

21. The cylinder B, provided at one end with a bearing in the side frame D and at its opposite end with an internal bearing *v*, in combination with the stud *w*, passing through the side frame D' and entering said bearing to support the cylinder at this latter end, substantially as and for the purpose set forth.

22. In a calendar, a day-wheel, a month-wheel eccentrically mounted with respect to the day-wheel, and means for imparting an intermittent rotary motion to the month-wheel about its own axis, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 4th day of September, 1889.

HENRY S. PRENTISS.

Witnesses:
A. FABER DU FAUR, Jr.,
EDUARD WOLFF.