(No Model.) 3 Sheets—Sheet 1.

S. W. RALPH.

CALENDAR CLOCK.

No. 354,346. Patented Dec. 14, 1886.

Fig. 1.

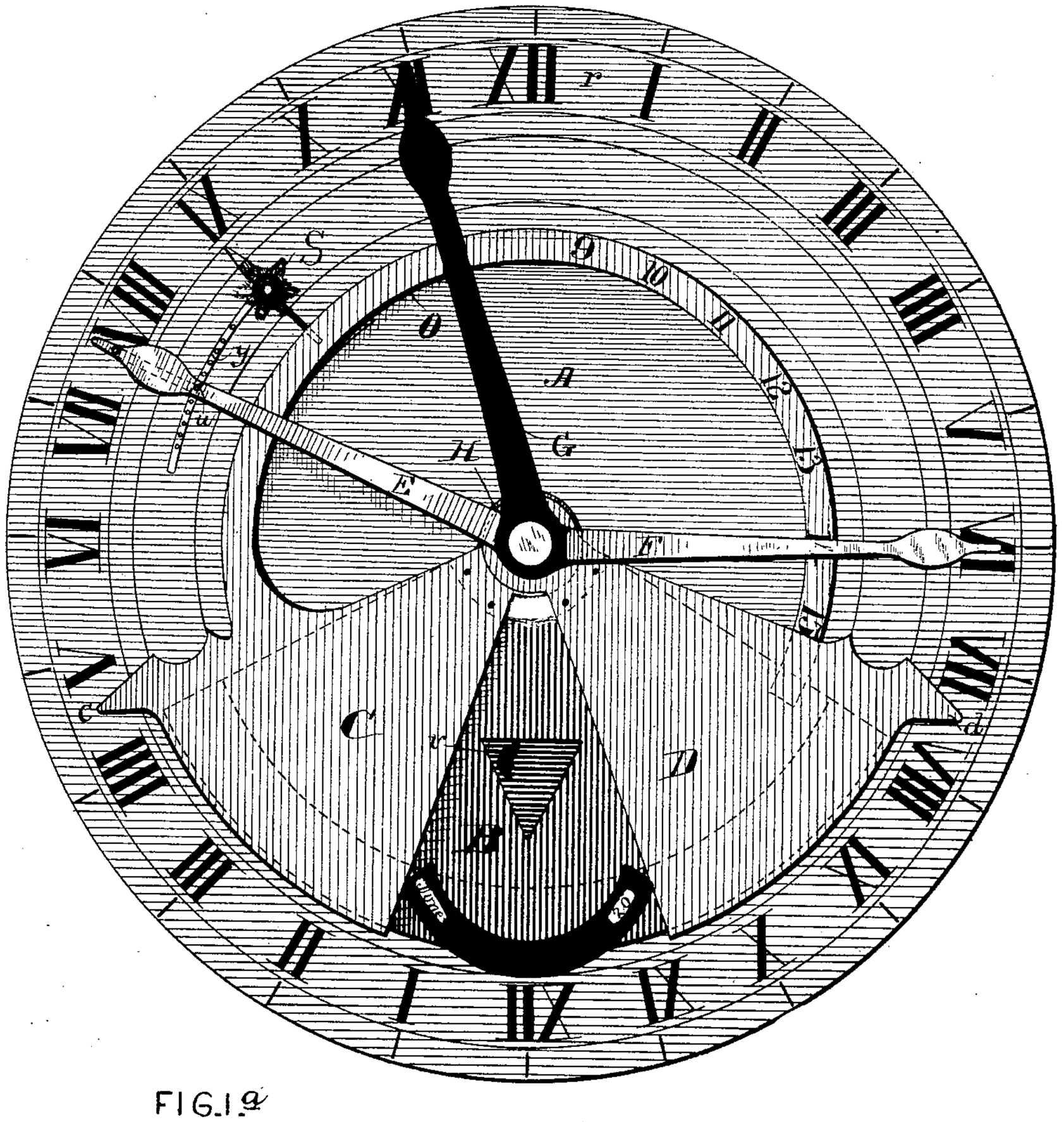

FIG. 1.

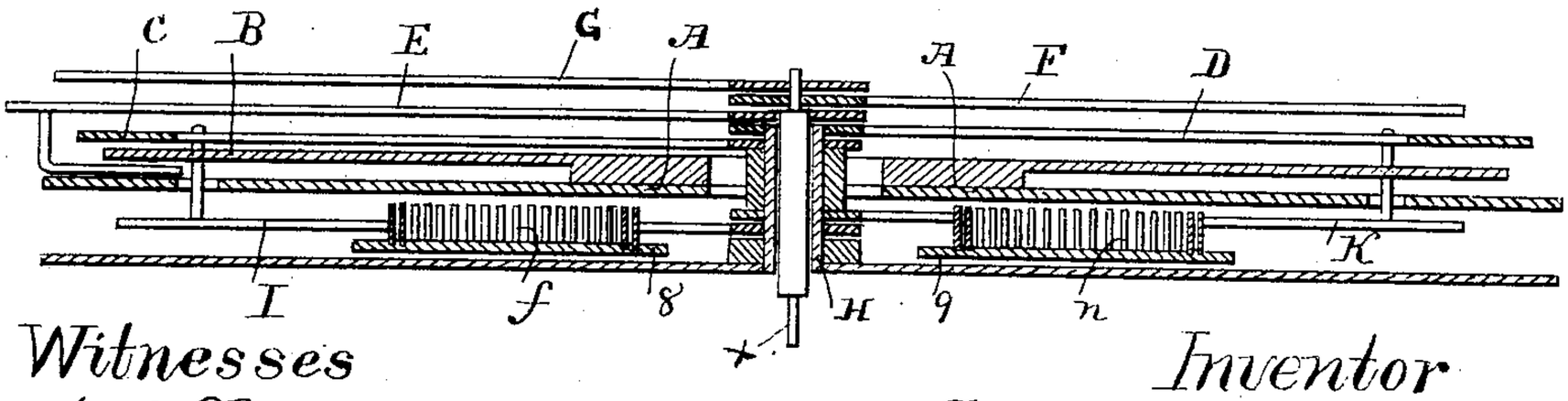

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Fig. 2.

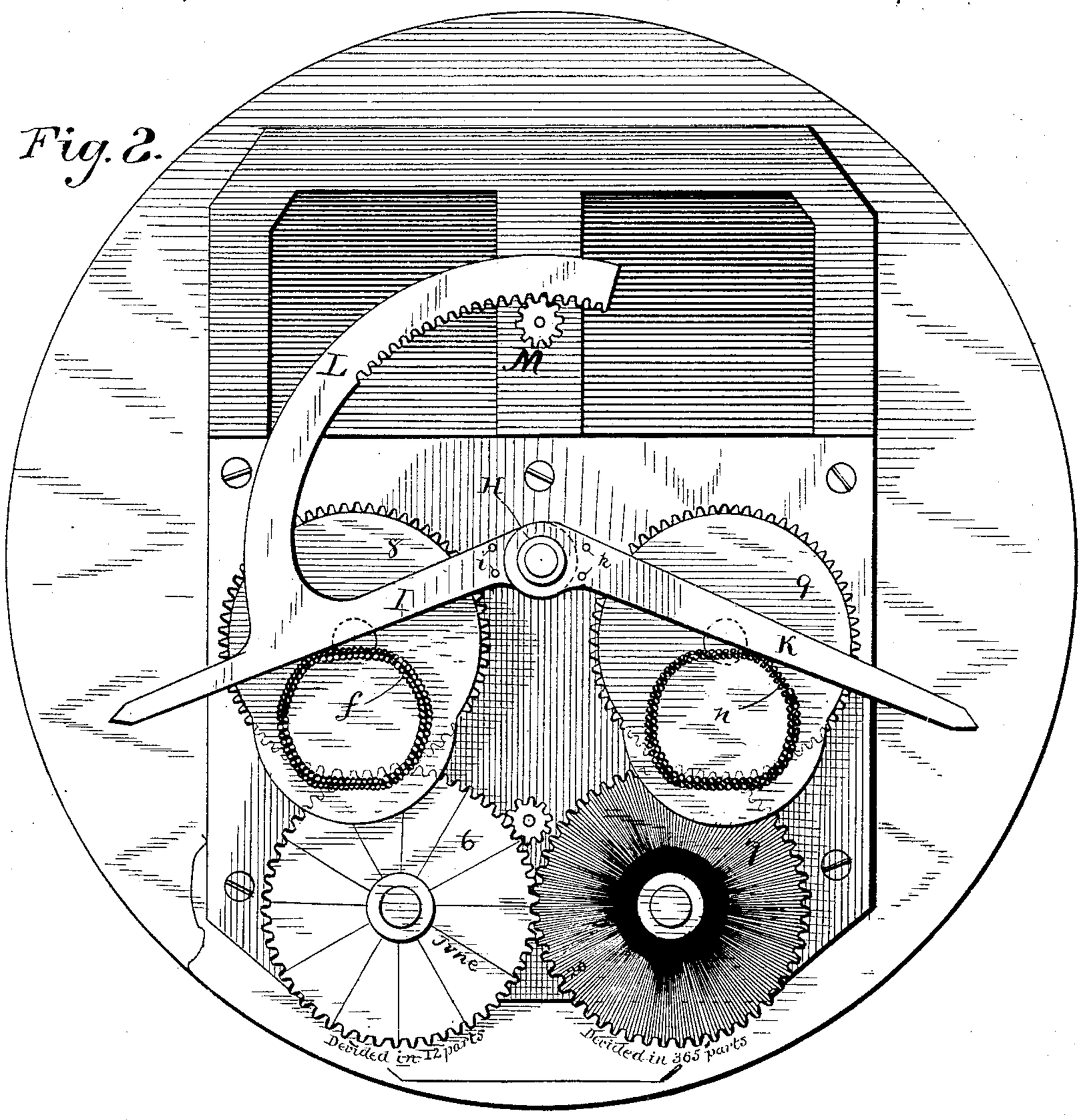
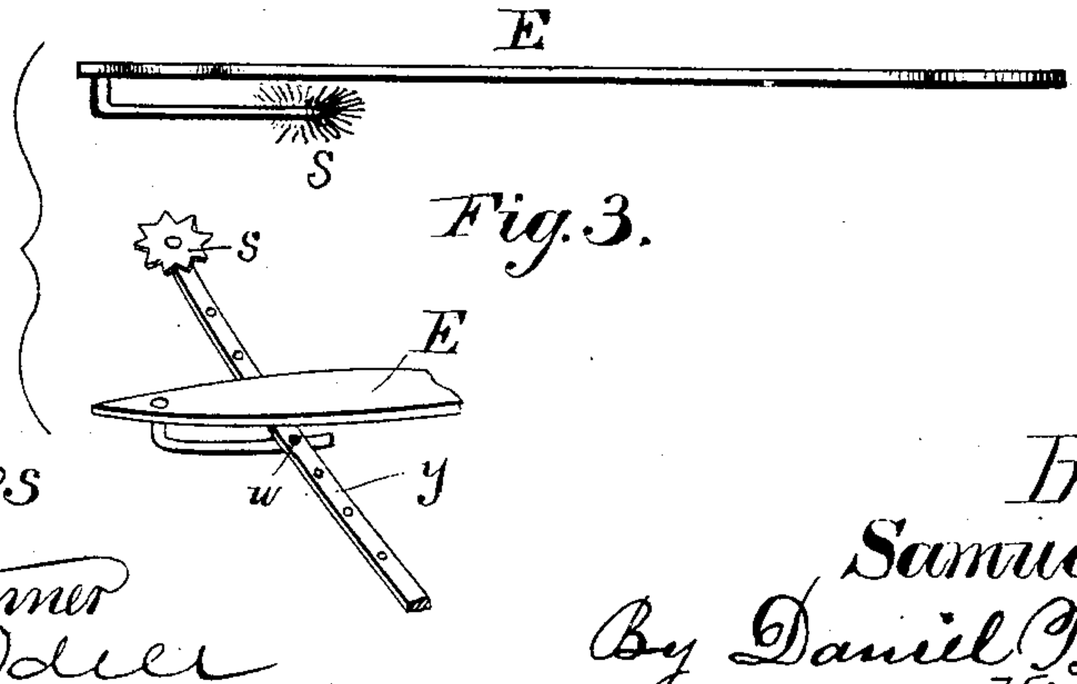


Fig. 3.



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(No Model.)

3 Sheets—Sheet 3.

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FIG. 6.

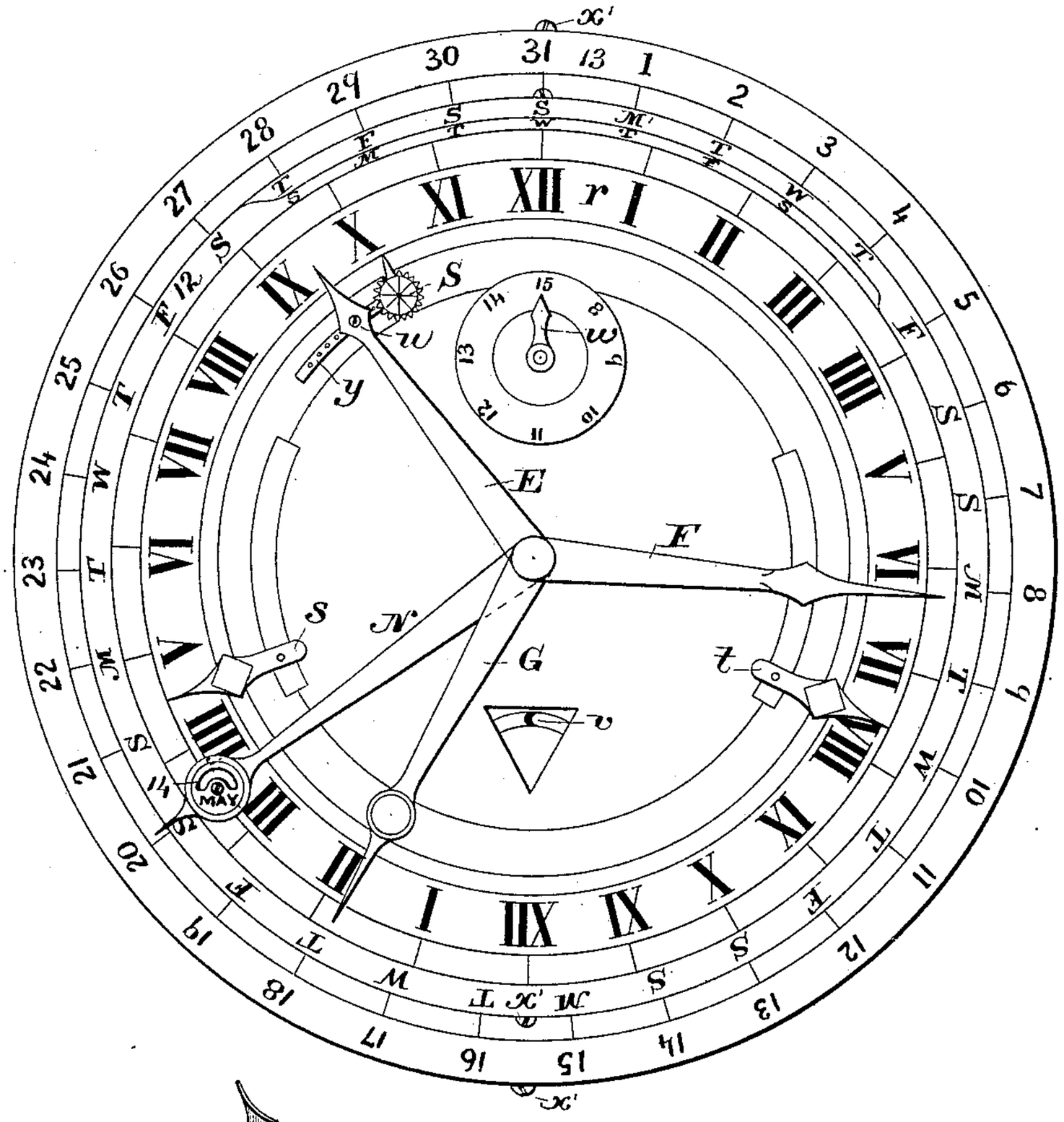


FIG. 4.

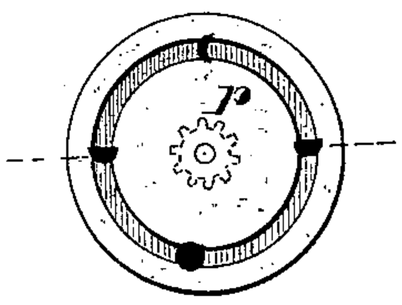
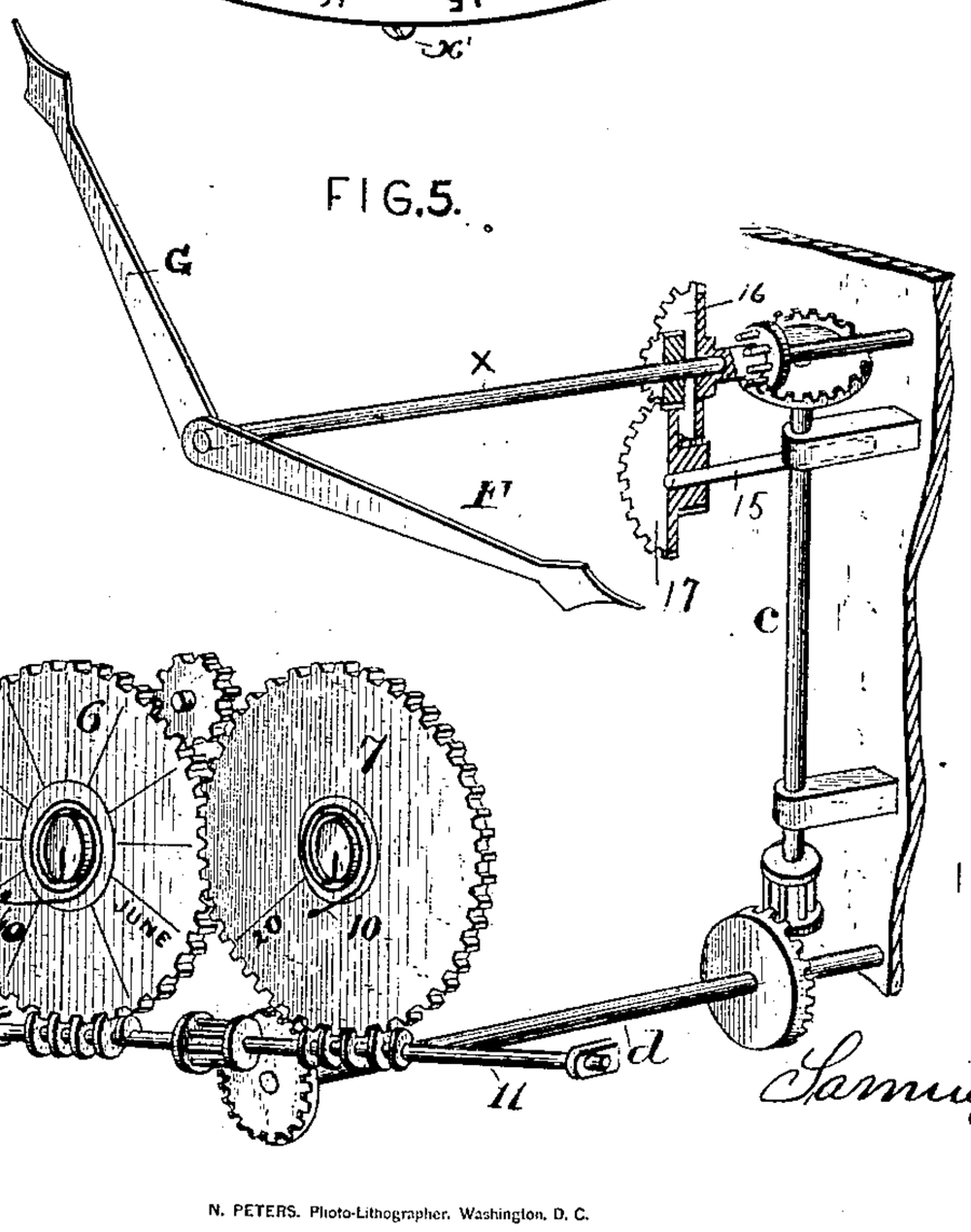


FIG. 4b

FIG. 5.



ATTEST

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UNITED STATES PATENT OFFICE.

SAMUEL W. RALPH, OF MECCA, OHIO.

CALENDAR-CLOCK.

SPECIFICATION forming part of Letters Patent No. 354,346, dated December 14, 1886.

Application filed March 25, 1885. Serial No. 160,124. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL W. RALPH, of Mecca, county of Trumbull, State of Ohio, have invented a new and useful Improvement in Clock Attachments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention consists of a clock attachment representing day and night, the length of the day, the change of the moon, and showing the hour at which the sun rises and sets each day throughout the year.

In the accompanying drawings, Figure 1 represents a front view of a clock-dial with my attachment thereon. The plates B C D represent night, and the part of dial above said plates day. Fig. 2 is a front view of the mechanism for operating my attachments, the dial being removed to show same. Fig. 3 represents a side view of the meridian or railroad hour-hand E, with the sun S and adjustable arm *y* attached to the back side of the meridian or railroad hour-hand by means of a screw at *u*, Fig. 1. Fig. 4 is a front view of a disk, *p*, for carrying the moon and showing the moon thereon. Fig. 5 is a view of a train for connecting my attachment to the train of a clock. Fig. 6 is a front view of a clock-dial with my attachments thereon (modified.) Fig. 1^a is a side view of my attachments and the dial of a clock. Fig. 4^b is a side view of the disk *p* cut in sections.

My clock attachments employ a dial with two sets of numerals to indicate the hours—one set at the right hand running from noon to midnight, and the other on the left hand running from midnight to noon, as seen in the dial A, Fig. 1, at *r*. In front of dial A is a stationary raised plate, B, behind which the sun S passes during the night, and in front of plate B are two additional plates, C and D, which are sector-shaped and attached to a stationary sleeve, H, (which is made to surround the ordinary center arbor, *x*, of a clock,) and made capable of swinging up and down, so that the pointer *c* upon plate C will indicate the time of sunrise and the pointer *d* on plate D will indicate the time of sunset for each day of the year. The above said sleeve is set in and fastened to the frame of a clock. (See Fig. 2.)

Attached to the center arbor, *x*, are three hands, E, F, and G. The hand E is a meridian or railroad hour-hand, to which the sun S is attached and carried in the diurnal circuit with said hand, the sun S being in sight during the day and passing behind plates D, B, and C during the night, or from sunset to sunrise. The hand F is a minute-hand for the railroad-hand E, and the hand G is a minute-hand for the sun S. The wheel 6 is suitably connected with the train of a clock and geared with it, so as to produce one revolution of wheel 6 in one year. In order to do this the hour-wheel makes three revolutions to the shaft 11's one, and the wheels 6 and 7 have each one hundred and twenty-two cogs, which mesh into the worm-gear on shaft 11, as shown in Fig. 5, which is fully described hereinafter. The wheel 6 gears with and transmits motion to wheel 7. These wheels give motion to wheels 8 and 9, which latter wheels give motion to the levers I and K, Fig. 2, by means of cams formed by set-pins in the holes *f* and *n*. These set-pins are set in disks which are fastened to and in front of wheels 8 and 9.

The lever I is fastened to the plate C by screws in the holes *i* and the lever K is fastened to the plate D by screws in the holes *k*, in order to carry the plates up and down with the levers, thus shortening the day as the levers raise until the cams have carried the levers nearly to their full height, and then allowing very little change as the flattened part of the cams supports the levers, after which the levers begin to fall and the day to lengthen.

The plate C, Fig. 1, carries a segment-arm, O, which is graduated to show the length of the day, or from sunrise to sunset, the year round. The end of this arm passes back of plates D and B (more or less) as the days are longer or shorter. The wheels 6, 7, 8, and 9 are set on stationary spindles set in the frame, but the spindles of wheels 6 and 7 are made to receive a coiled spring acting as a pin, 10, to hold the wheels on, and also to assist in giving power to operate my attachment. This power is obtained by carrying the outer end of the spring two or three more times around the spindles than it would naturally stand, and then putting the end of the spring in a hole in the wheel to hold it there. (See Fig. 5 at 10.)

The wheels 6 and 7 are acted upon by arbor 11 having right and left worm-gear, which mesh into the teeth of wheels 6 and 7, and this arbor 11 is geared to the center arbor, *x*, by means of an hour-wheel, 16, crown-wheels, and pinions set on arbors 11, *d*, *c*, and *x*, and a wheel, 17, and pinion on arbor 15. These crown-wheels must have the right number of cogs, (more or less, as the case may require,) in order to produce the desired result—viz., the revolution of wheel 6 in one year.

The dial-plate A has adjacent to the two sets of numerals *r* two circles, 12 and 13. The outermost one, 13, is divided into thirty-one parts, and numbered from 1 to 31, for the purpose of showing the days of the month. The interior one, 12, is also divided into thirty-one parts and marked with the days of the week. (See Fig. 6.) These circles are each made separate and apart from dial A, and are also made adjustable and fastened to dial A by screws *x'*, so that by setting them the first of each month they will give the day of week and month through the whole month.

The pointer N, Fig. 6, carries a small disk, 14, fastened at the center by means of a screw, and one half of said disk is made to exceed the other half in weight, so that the heaviest part will always hang downward. Upon disk 14 is marked the name of the month, and at the end of each month this disk is exchanged for another disk marked with the following month, and so on throughout the year.

The wheels 6 and 7 marked June and 20 are so marked only for the purpose of assisting in setting the cams to the proper time of year. This is done by hand, viz: Let the levers I and K fall to the lowest point, then slip off the wheels 6 and 7 and put them back on, so that the word June and numeral 20 will be directly opposite each other, then turn the wheels until the pointers *c* and *d* will point to the time on dial A that the sun rises and sets, the pins *f* and *n* being first adjusted to the rising and setting of the sun. If properly adjusted, they will give the pointers their proper position throughout the year.

The moon, as seen in the triangular space at *v*, Fig. 1, is carried upon a disk, *p*, behind plate B, and is made to slide by hand in a groove on this disk. The four changes of the moon are represented on this disk, and each one is made to slide in the groove, so that by setting them to their proper time the four changes will be given when their time arrives, and so on around the disk. The cogs on the back of this disk may be arranged by putting less cogs on, so as to produce various numbers of changes as the disk passes around. (For disk *p* see Figs. 4 and 4ᵇ.)

As a modification or substitute for the segment-arm O with the numbers thereon, as seen in Fig. 1, a segment-arm, L, Fig. 2, may be employed in connection with pinion M, having an index-hand in connection with a small dial on the face of a clock, as seen in Fig. 6 at *w*.

As a modification for the pointers *c* and *d* and plates B C D shown in Fig. 1, the end of the levers I and K may pass through the dial and form pointers; or pointers may be attached to the levers, as seen in Fig. 6 at *s* and *t*.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a calendar-clock, the combination, with the dial A, of the attachment of the sun S and adjustable arm *y*, attached to the hour-hand E, so as to distinguish between railroad and sun time on any meridian.

2. In a calendar-clock, the combination, with the dial A, of the plates B C D and segment-arm O and moon *v*.

3. In a calendar-clock, the combination of the train of a clock with the wheels 6, 7, 8, and 9, having two cams, *f* and *n*, in connection with the levers I and K, and arbor 11, with disk *p* and train *d c x*, substantially as set forth.

In testimony whereof I have hereunto set my hand this 14th day of March, A. D. 1885.

SAMUEL W. RALPH.

Witnesses:
D. P. COWL,
DANIEL BREED.