

No. 819,950.

PATENTED MAY 8, 1906.

E. TERRELL.
CALENDAR CLOCK.

APPLICATION FILED APR. 15, 1905.

2 SHEETS—SHEET 1.

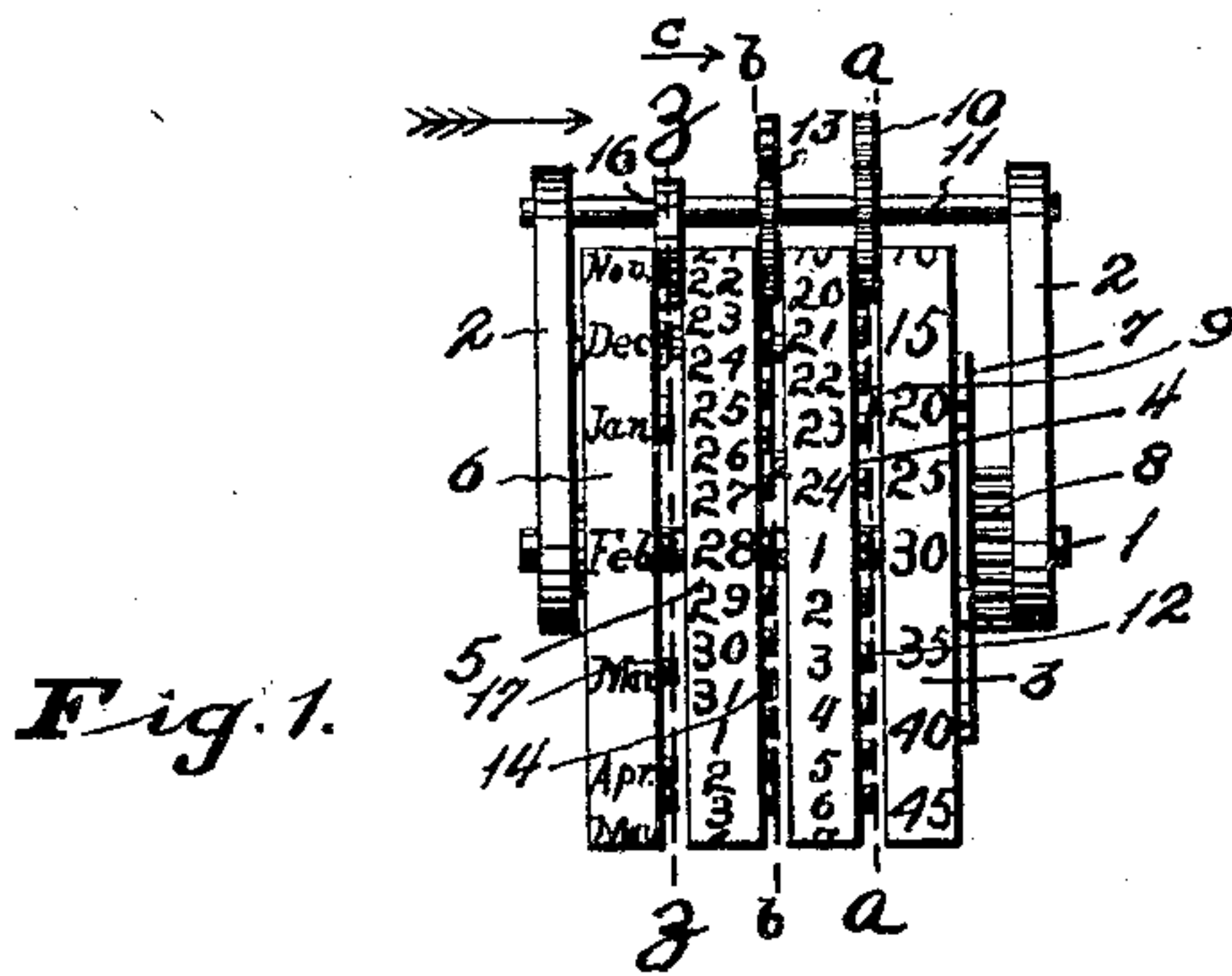


Fig. 1.

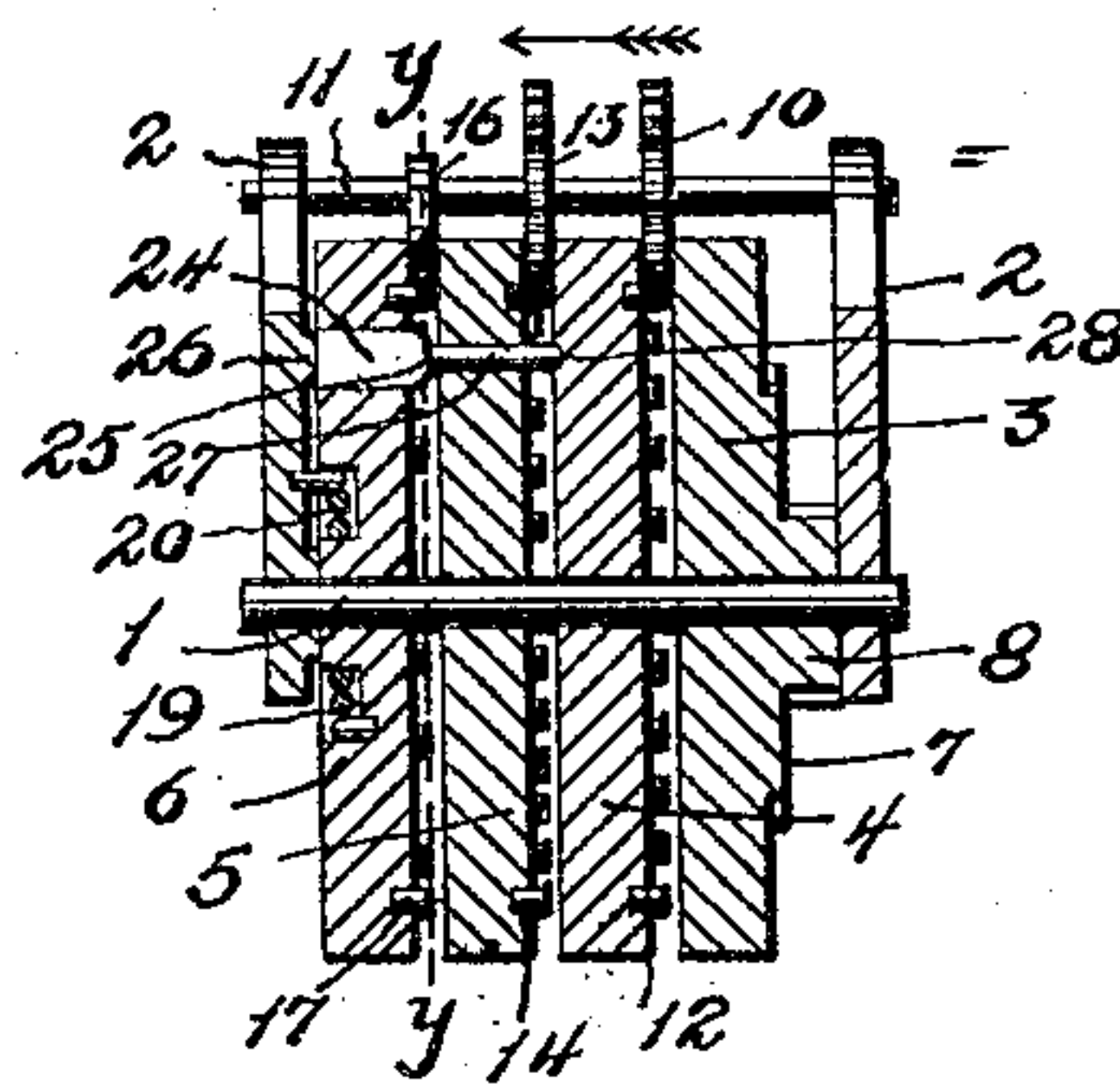


Fig. 2.

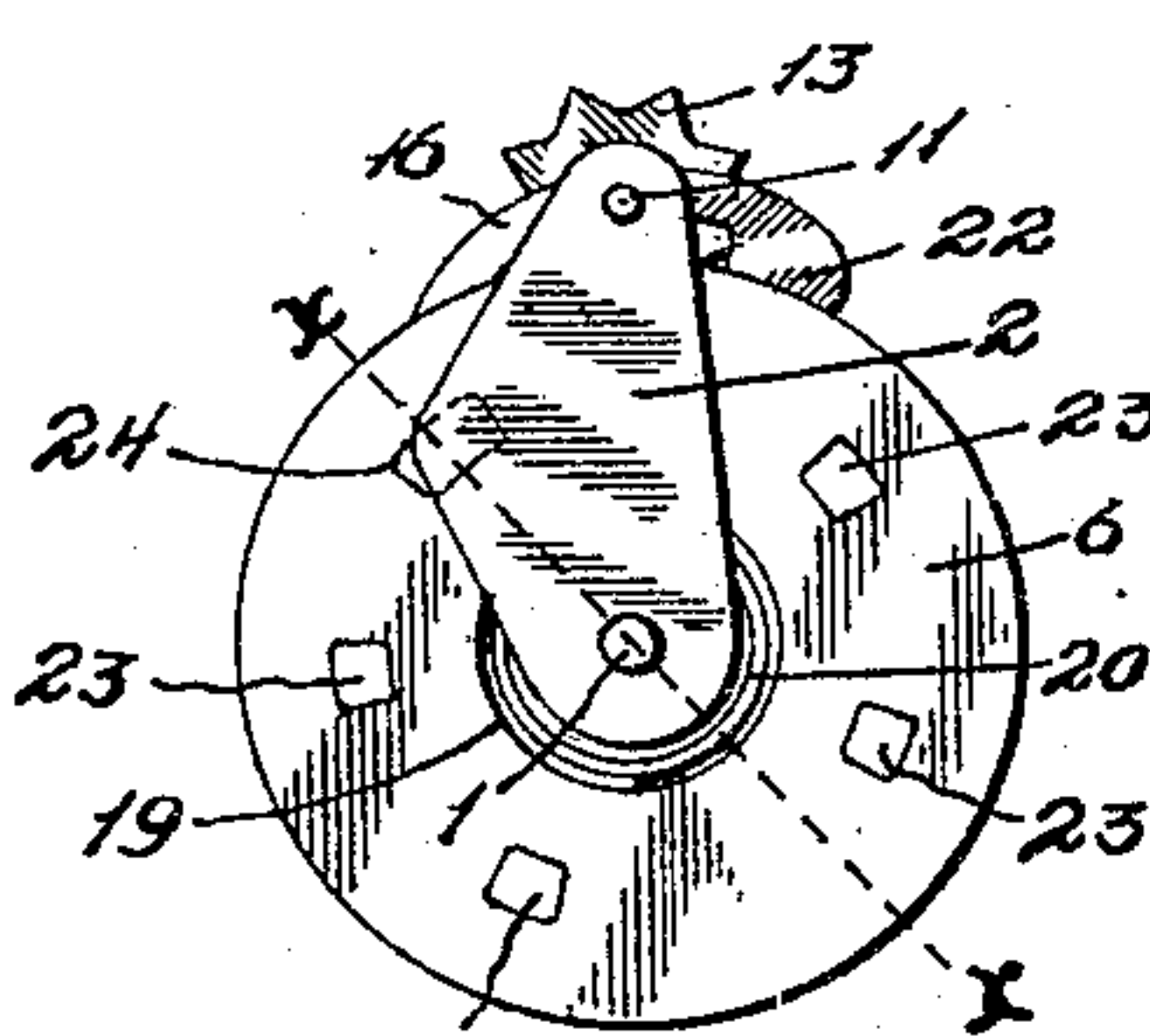


Fig. 3.

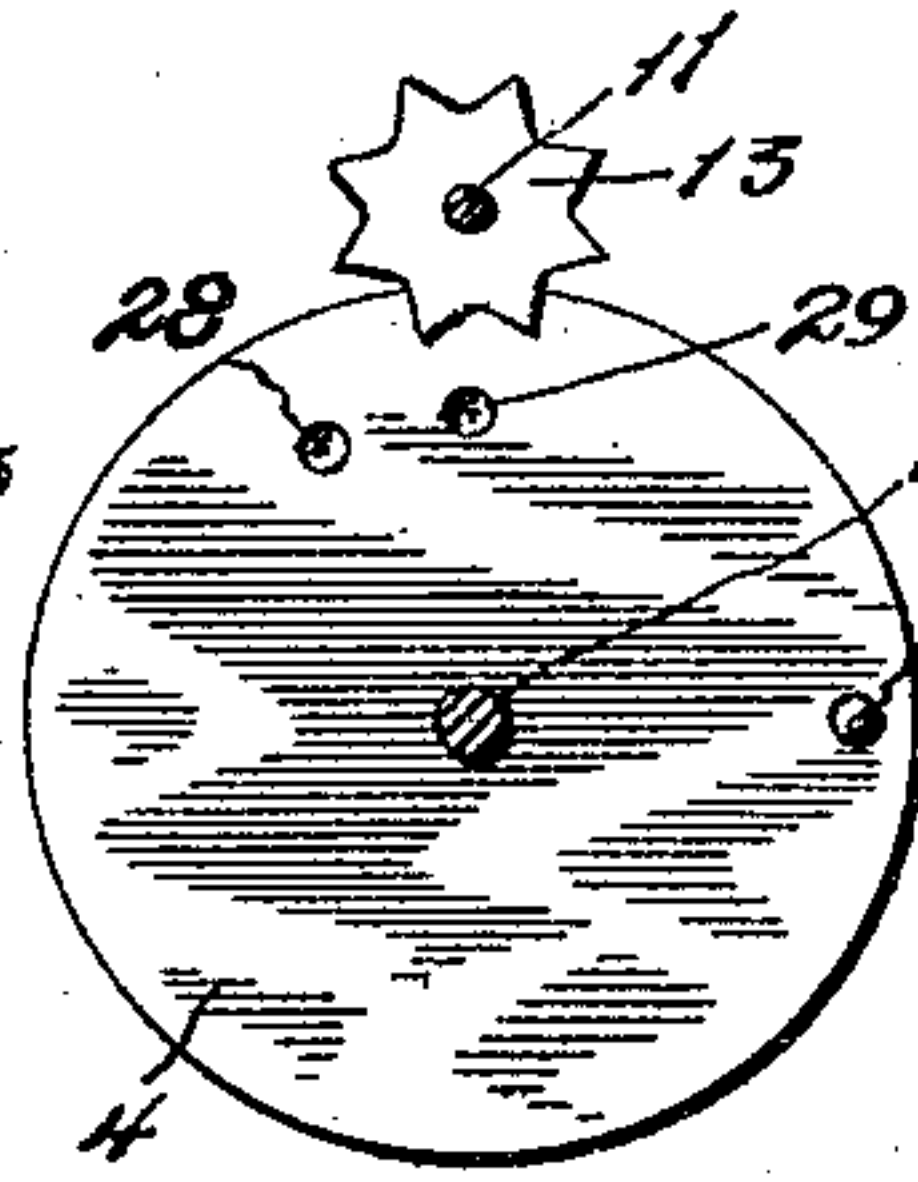


Fig. 4.

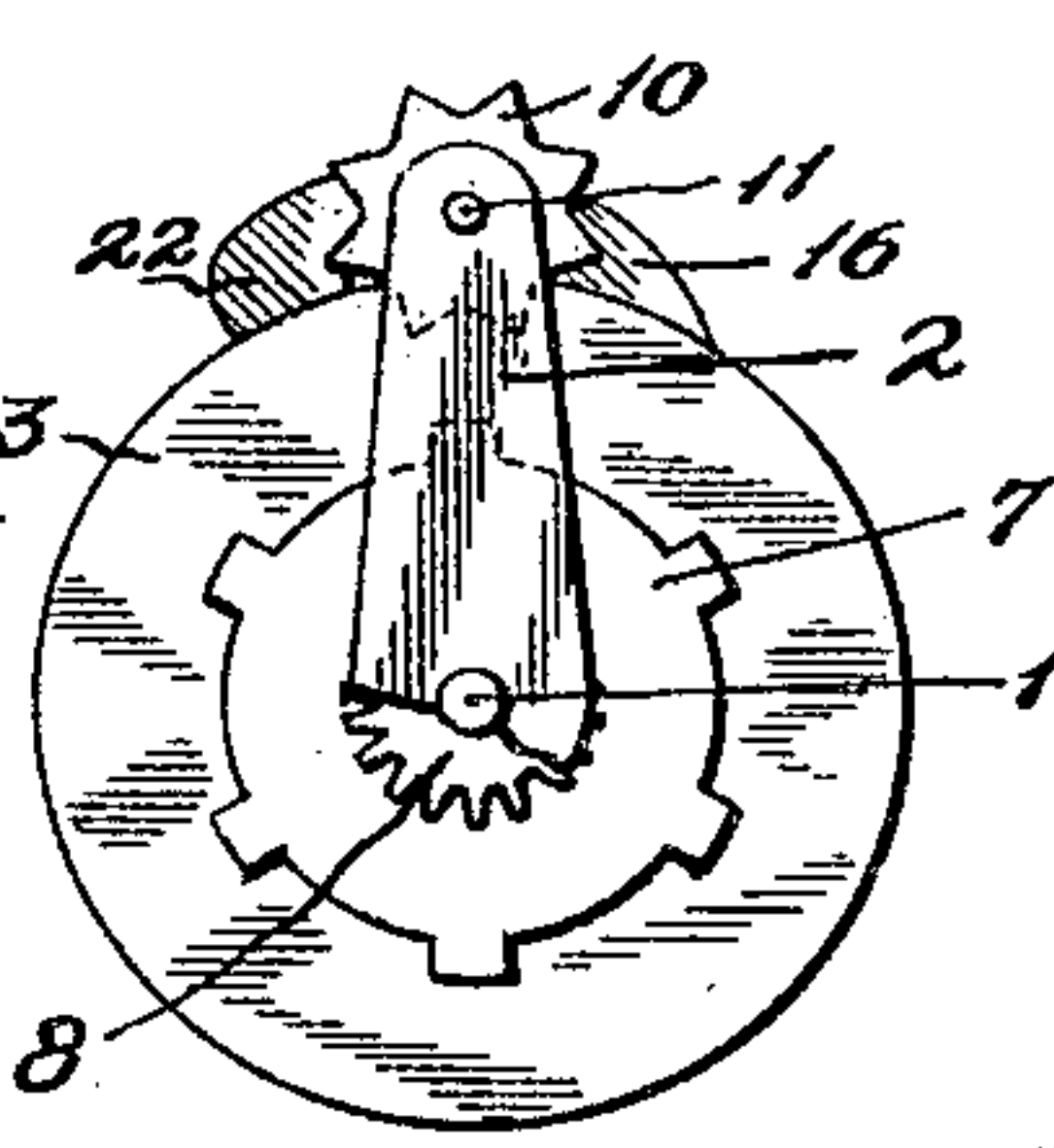


Fig. 5.

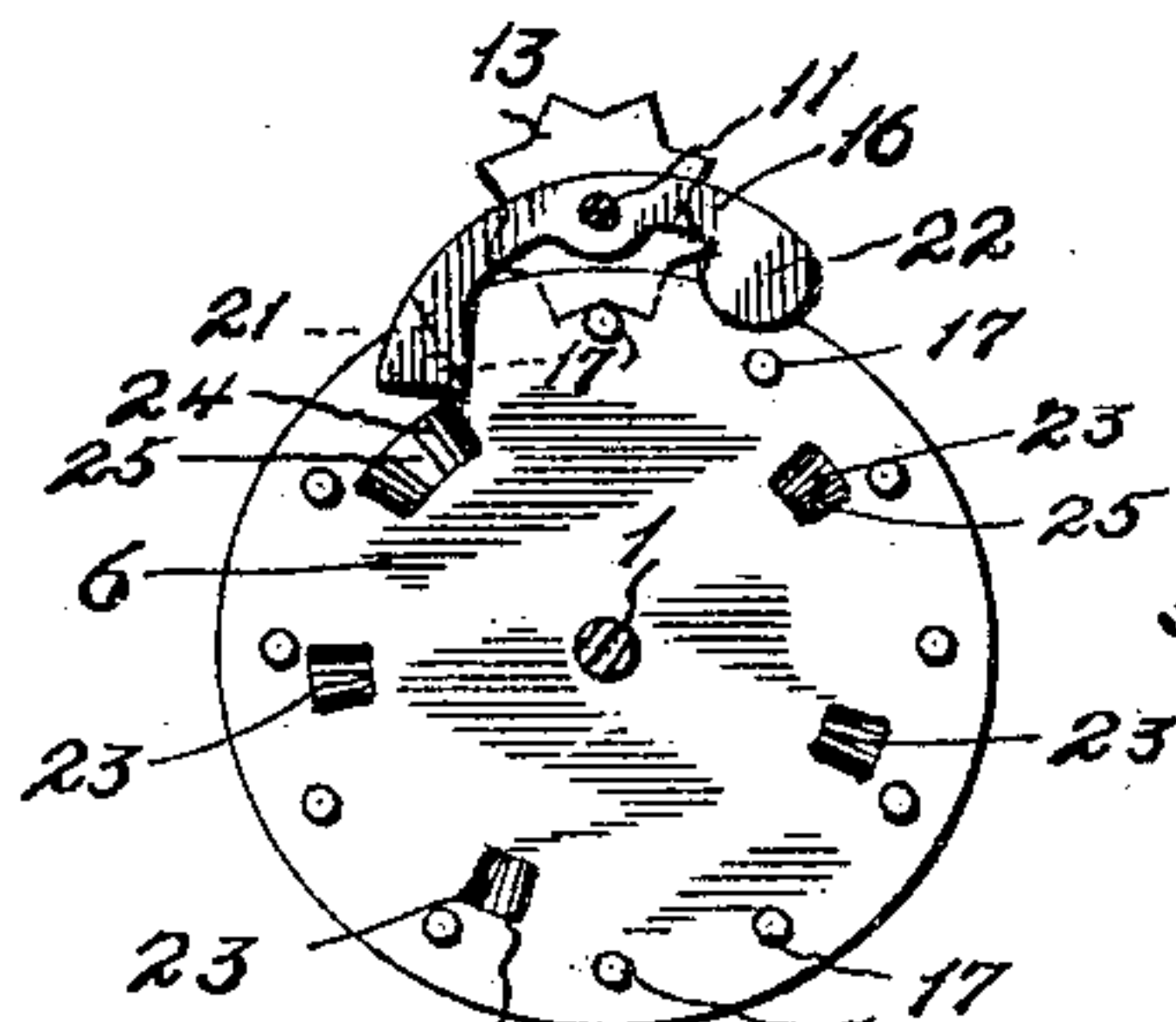


Fig. 6.

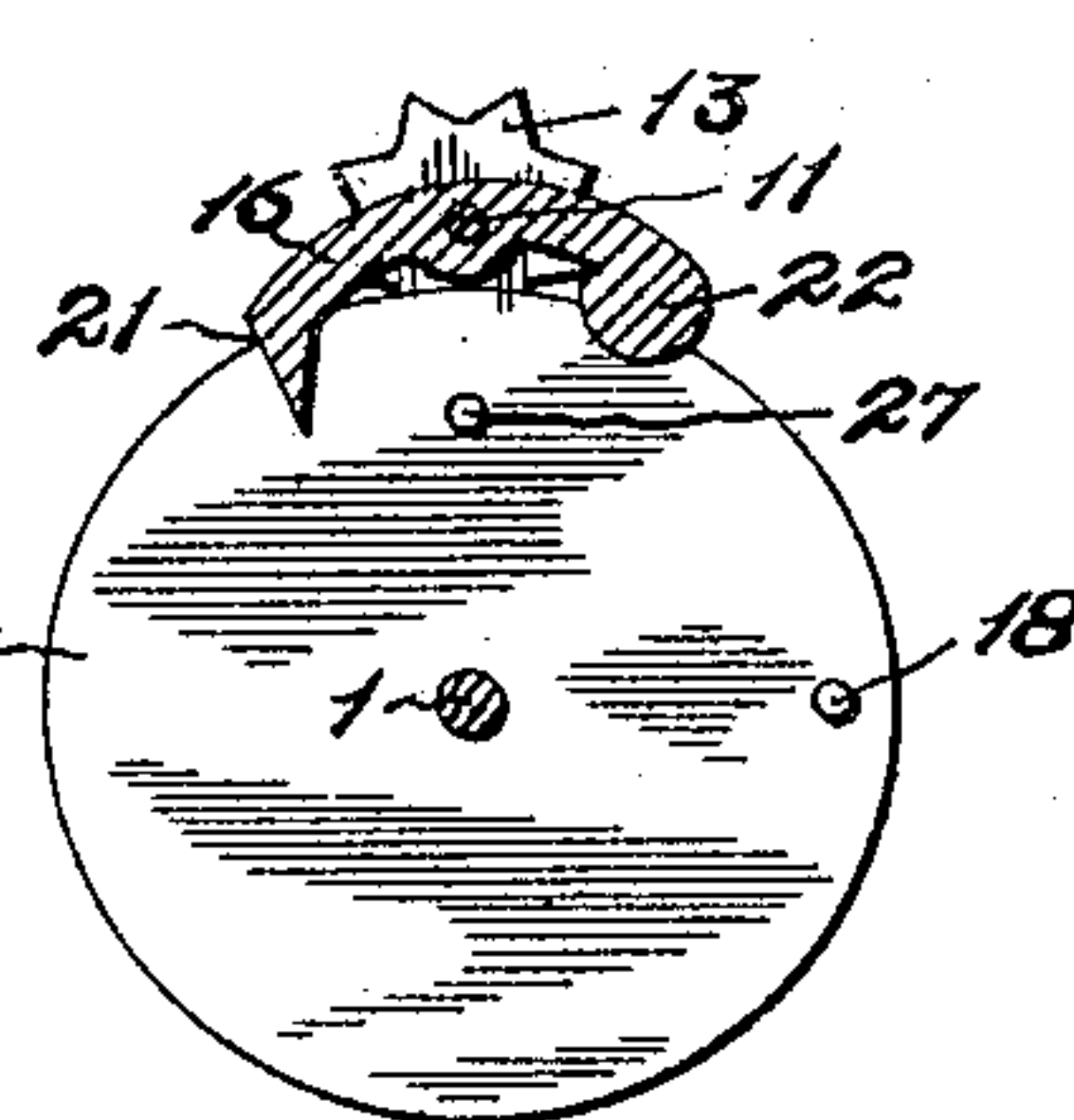


Fig. 7.

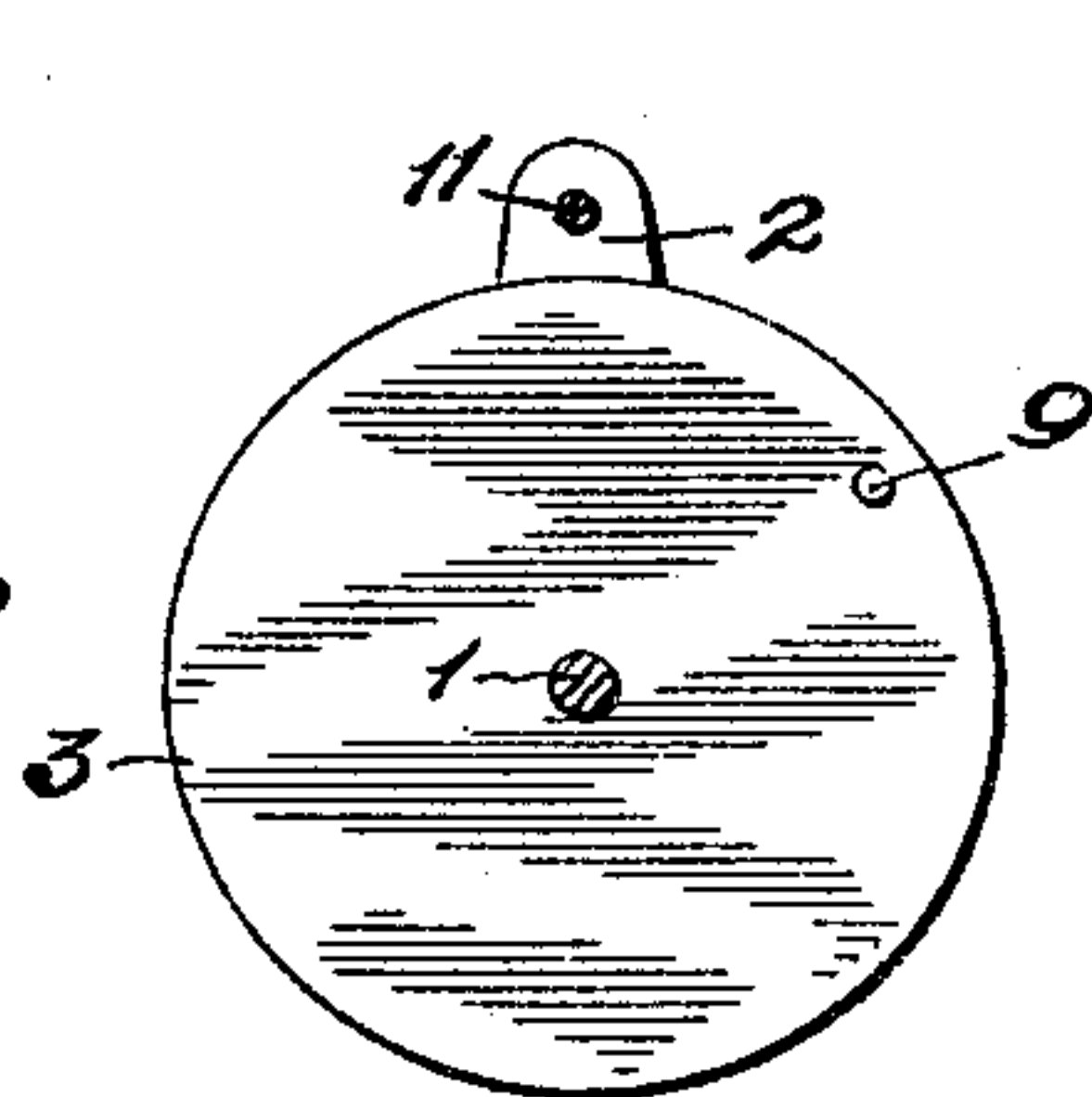


Fig. 8.



Fig. 9.

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2 SHEETS—SHEET 2

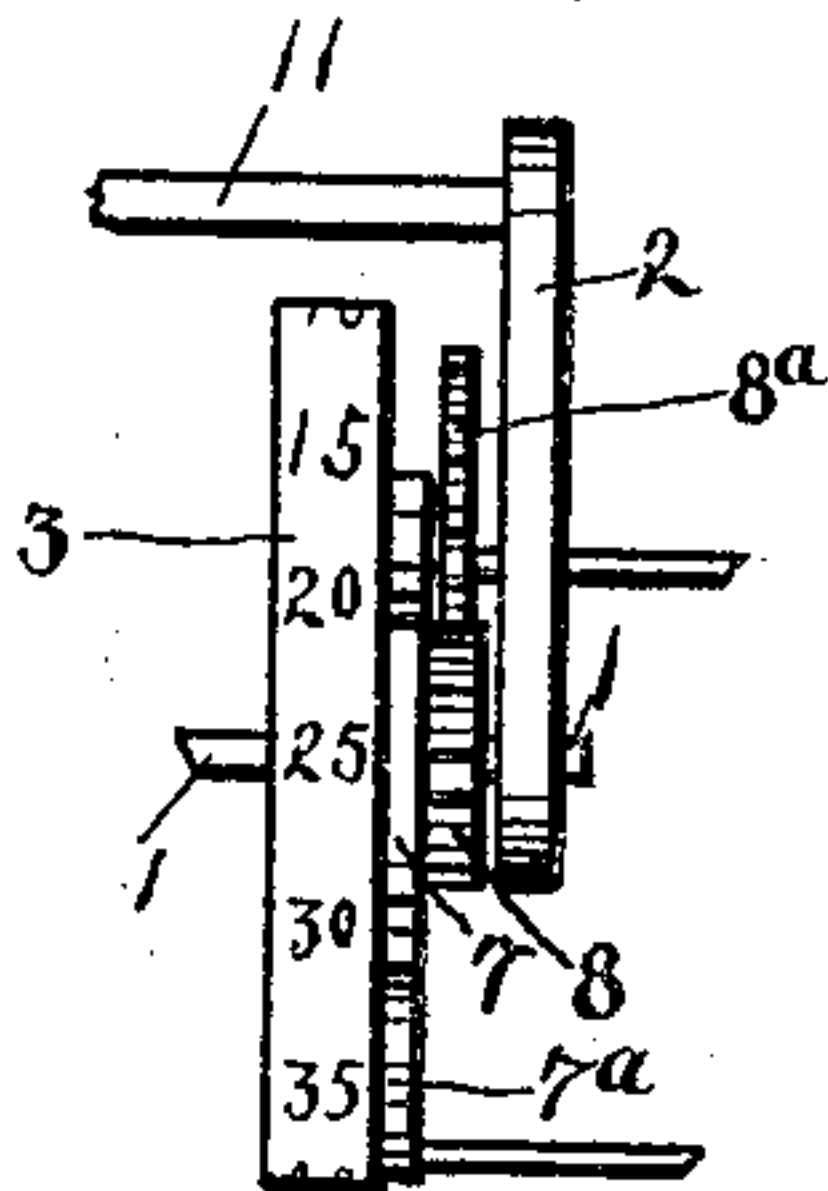


Fig 10

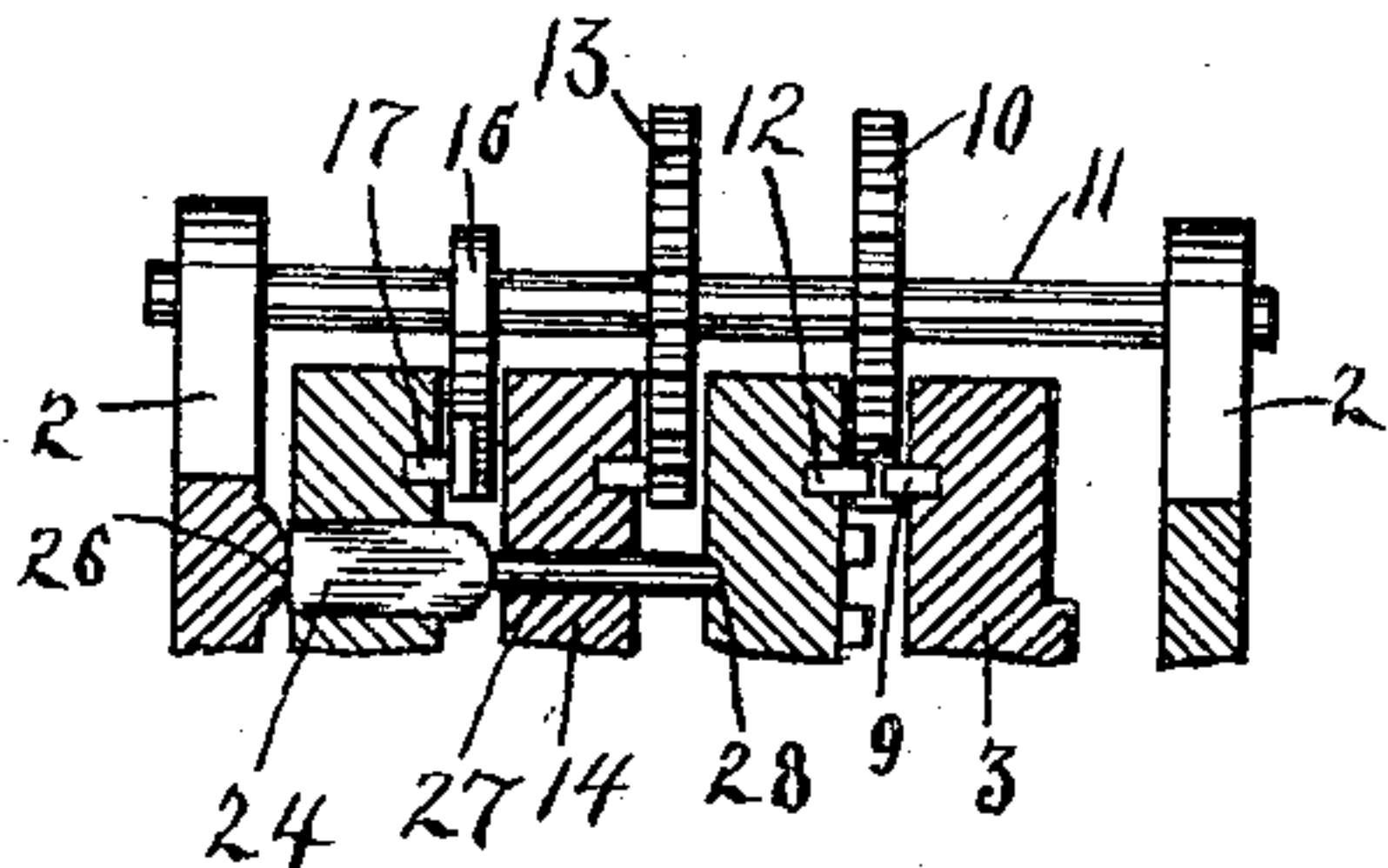


Fig 12

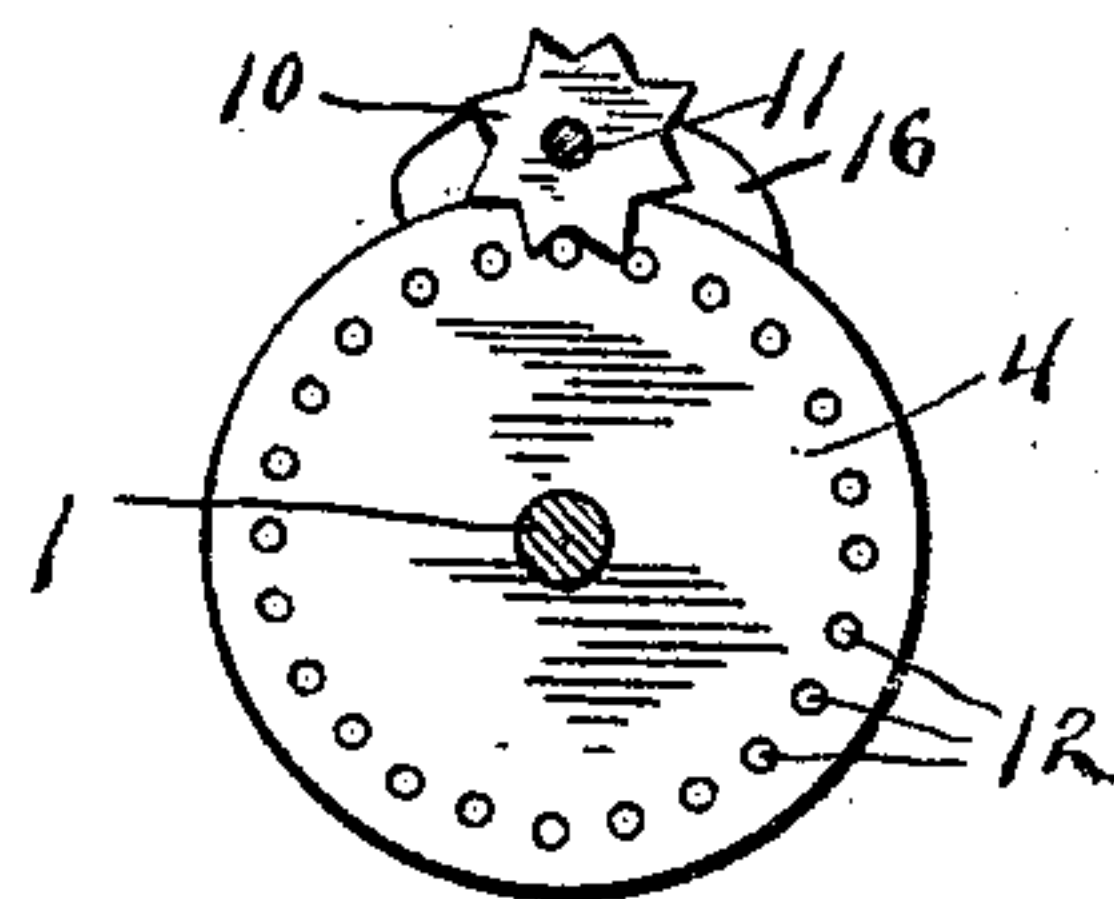


Fig 13

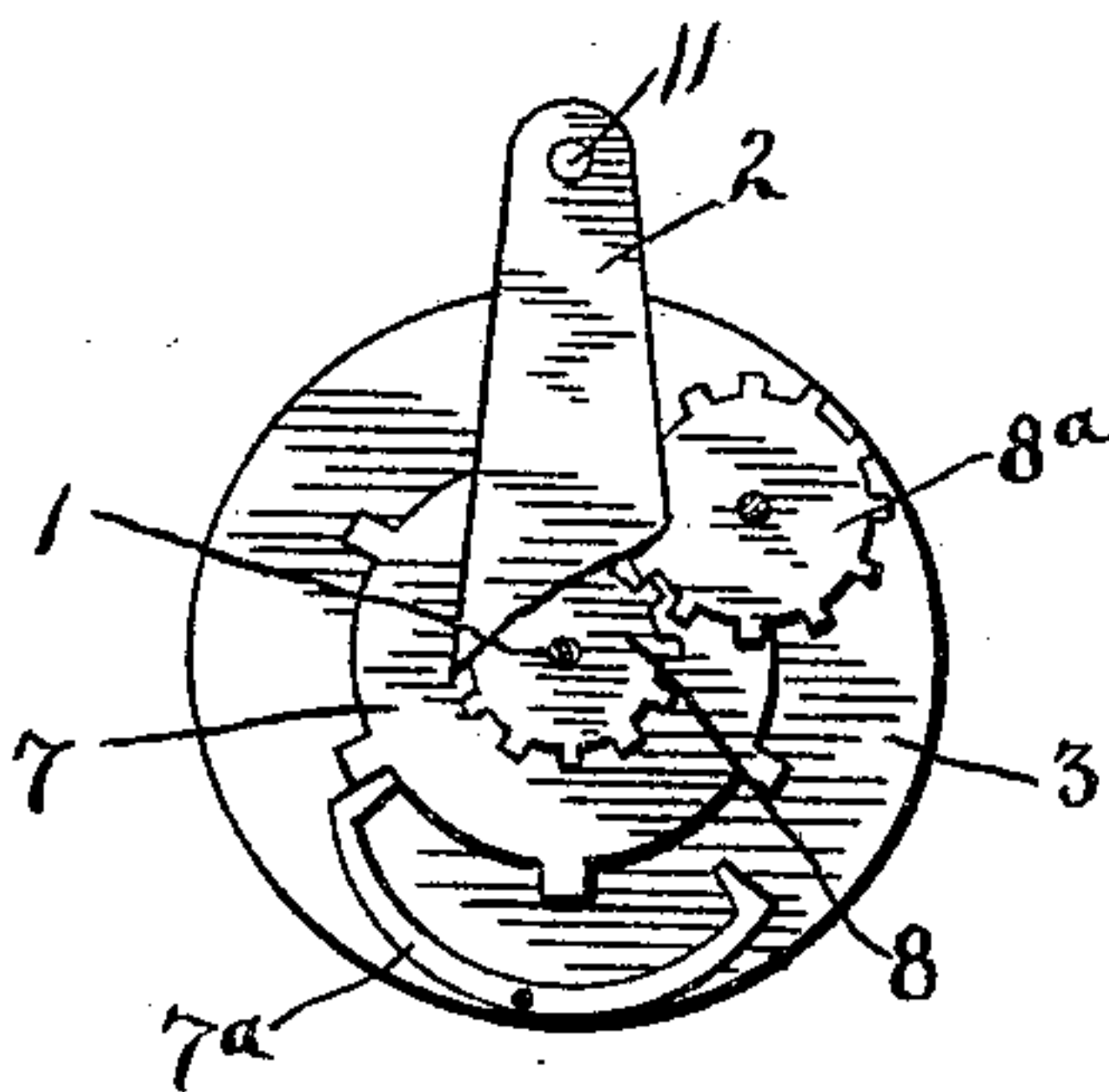


Fig 11



Fig 14

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UNITED STATES PATENT OFFICE.

ELAH TERRELL, OF COLUMBUS, OHIO.

CALENDAR-CLOCK.

No. 819,950.

Specification of Letters Patent.

Patented May 8, 1906.

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To all whom it may concern:

Be it known that I, ELAH TERRELL, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Indicating Mechanism for Calendar-Clocks, of which the following is a specification.

My invention relates to a new and useful improvement in calendar-clocks, and more especially to the indicating mechanism.

The object of the invention is to provide a mechanism of simple construction whereby the month, day, hour, and minute will be indicated correctly and one in which the number of parts is reduced to a minimum and the whole device constructed so as to be produced in a compact and convenient form.

Finally, the object of the invention is to provide a mechanism of the character described that will be strong, durable, and efficient, simple and comparatively inexpensive to make, and one in which the several parts will not be liable to get out of working order.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation. Fig. 2 is a longitudinal sectional view taken on the line *xx* of Fig. 3 and looking at right angles to the said line, the transfer mechanism and a portion of its supports being shown in elevation. Fig. 3 is an elevation of the left-hand end of the mechanism with reference to Fig. 1. Fig. 4 is an elevation of the opposite or right-hand end. Fig. 5 is an elevation taken on the line *yy* of Fig. 2 and looking in the direction of the arrow. Fig. 6 is a transverse sectional view taken on the line *zz* of Fig. 1 looking in the direction of the arrow and showing some of the parts in elevation. Fig. 7 is an elevation on the line *aa* of Fig. 1 looking in the direction of the arrow. Fig. 8 is a side elevation of the month-wheel-retaining dog, and Fig. 9 is an elevation taken on the line *bb* of Fig. 1 and looking in the direction of the arrow *c*. Fig. 10 is a front elevation of the minute-wheel shown in connection with an escapement and driving-gear. Fig. 11 is an

end elevation showing the anchor-escapement and clock-gear. Fig. 12 is a detail sectional view showing the transfer mechanism. Fig. 13 is a side elevation of the hour-wheel and one of the pinions. Fig. 14 is a view of the longitudinally-movable pins.

In the drawings the numeral 1 designates the main or driving-shaft, on the opposite ends of which are vertically-arranged arms 2. Between the arms four wheels 3, 4, 5, and 6, respectively, are mounted. These wheels, beginning with the right-hand wheel 3, constitute the minute, hour, day, and month indicating devices or wheels, respectively. The minute-wheel 3 has arranged on its periphery suitable numerals for indicating each five minutes in the hour, the numerals starting with "5" and ending with "55." On the outer or right-hand side of the wheel 3 I form concentric with the shaft 1 an escapement-wheel 7, which is provided with an anchor 7^a, operated by the clockworks in any approved manner, and between the escapement-wheel and the right-hand arm I arrange a pinion 8, formed integral with or secured to the escapement and the minute wheel. This pinion is connected to the driving-train of the hereinbefore-mentioned clockworks through the gear-wheel 8^a, so that motion will be imparted to the minute-wheel. By this arrangement the minute-wheel is caused to revolve intermittently. These intermittent movements are timed so as to occur every five minutes, thus giving the wheel 4 intermittent movements to each complete revolution, the numerals being so arranged as to indicate the correct time as the wheel moves. On its opposite side the minute-wheel 3 carries a short pin 9, Fig. 7, adapted to engage a star-wheel 10, which projects a short distance between the minute-wheel 3 and the hour-wheel 4, which is next adjacent thereto. The star-wheel 10 is mounted on a shaft 11, supported above the wheels in the upper ends of the arms 2. This star-wheel, which acts as a part of the transfer mechanism, has a width greater than the length of the projecting portion of the pin 9, so as to be engaged on its opposite side by one of the pins 12 of the hour-wheel 4, it being understood that the pins 12 and the pin 9 are of such length as to readily pass each other, but engage with the star-wheel. The periphery of the hour-

wheel 4 is provided with the numerals "1" to "24," indicating the twenty-four hours of the day, or, if it is desired, two sets of numerals each running from "1" to "12" may be employed. However, the hour-wheel must have twenty-four intermittent movements to every complete revolution, and therefore I provide twenty-four of the pins 12, between the uppermost two of which one of the points of the star-wheel always projects, and thus it is apparent that when the minute-wheel 3 has completed a full revolution, which it does every hour, the pin 9 will engage with the lowermost point of the star-wheel and move the same so as to transmit motion to the hour-wheel and cause it to move one twenty-fourth of its revolution, indicating that one hour has passed, and the next point of the star-wheel will be moved downward between the next succeeding pins 12, thus preventing further movement of the hour-wheel until the minute-wheel has completed another revolution.

Between the hour-wheel 4 and the day-wheel 5 I arrange on the shaft 11 a second star-wheel 13, similar to the star-wheel 10 and filling the space and projecting between the wheels, as in the case of the first star-wheel 10. It will be apparent that the day-wheel 5, carrying on its periphery the thirty-one numerals of the longest months, must be moved intermittently thirty-one times to every complete revolution, so as to indicate a day at each movement. Therefore on the side of the day-wheel adjacent to the hour-wheel I arrange thirty-one pins 14, similar to the pins 12 and adapted to engage with the second star-wheel 13 in a similar manner. The hour-wheel 4 is provided with a pin 15, which also engages with the star-wheel, so that every time the said pin passes the star-wheel the same will be moved one point, and thus move the day-wheel one intermittent movement or one thirty-first of a revolution. Between the day-wheel 5 and the month-wheel 6 I arrange on the shaft 11 a dog 16, which has sufficient thickness to fill the space between the said wheels. The month-wheel 6 is formed on its periphery with the proper symbols indicating the twelve months and is provided on its side adjacent to the day-wheel with twelve short pins 17, similar to the pins 14 and 12, so as to provide means for giving to the month-wheel twelve intermittent movements to every revolution, and thus indicating the change in the month at every intermittent movement. These pins project only partially across the space between the day-wheel and the month-wheel, so as to engage with the dog 16 and yet pass without interference with a single pin 18 projecting from the adjacent side of the day-wheel 5 and also engaging with the dog 16. For imparting motion to the month-wheel I provide the

same near its center with an annular recess 19, in which is arranged a coiled spring 20, having one of its ends secured to the month-wheel and its opposite end secured to the right-hand arm 2. The spring being wound, the month-wheel is held against rotation by the dog 16, which is provided on its side adjacent to the said month-wheel with an inclined shoulder 21, which, owing to the fact that the lower end of the dog which is provided with the said shoulder is heavier, will cause the said shoulder to be positioned in the path of one of the pins 17 which abuts the same. The dog 16 is formed at its opposite or upper end with a rounded boss or enlargement 22, which normally lies above and out of the path of the pin 17. As the day-wheel 5 is moved around once in every complete revolution, the pin 18 engages with the lower end of the dog 16 and riding along the same forces or swings the dog upward, thus swinging the shoulder 21 out of the path of the pin 17 and allowing the spring 20 to revolve the month-wheel. The month-wheel is prevented from moving or being moved more than a twelfth of a revolution by the boss 22, which, when the dog is swung upward by the pin 18, is forced downward, so as to provide a stop against which the nearest adjacent pin moving toward the stop abuts, and the said pin 17 riding along the rounded surface of the boss 22 swings the dog upward, so as to swing its end carrying the shoulder 21 downward and into the path of the next succeeding pin 17, and thus preventing further movement of the month-wheel.

It is obvious that as the months of September, April, June, and November have thirty days and the month of February twenty-eight days, except during leap-year, and the other months having thirty-one days some provision must be made for causing the month-wheel to be moved at the proper time. To accomplish this, I arrange in the month-wheel transverse or lateral plungers 23 and an elongated plunger 24. These plungers are arranged equidistant from the center of the wheel and inside of the pins 17. The plungers 23 are so spaced as to be brought into operation at the end of a thirty-day month and the plunger 24 is positioned so as to operate at the end of the month of February, which ordinarily has twenty-eight days. It will be apparent that no special construction will have to be brought into operation at the end of the months containing thirty-one days, as the day-wheel is arranged to indicate thirty-one days and to have thirty-one intermittent movements indicating a day at each movement. The plungers 23 and 24 extend entirely through the month-wheel and are each provided with a curved end 25 adjacent to the day-wheel 5. The plungers normally project slightly beyond and to the left of the

month-wheel, but not far enough to bind against the left-hand arm 2, although passing in close proximity to the inner side of the same. The said arm 2 is provided with a slight rounded boss 26, disposed in the path of the plungers so that when the latter are swung into contact with the boss 26 they will be moved laterally or transversely through the numeral-wheel, so as to cause their rounded ends 23 to project beyond the right-hand side of the month-wheel and in close proximity to the left-hand side of the day-wheel. Of course it is to be understood that the boss 26 is of such length and proportions as to cause only one plunger to operate at a time. A loose pin 27 is mounted to slide laterally in the day-wheel and having such length as to be engaged and forced to the right by one of the plungers 23 or 24 when the same are moved to the right by the boss 26. The hour-wheel on its side adjacent to the day-wheel is provided with two slight depressions 28 and 29, so disposed as to receive the free end of the loose pin 27 when the same is moved to the right. It will be apparent that when the plunger is out of engagement with the boss 26 there will be no pressure on the loose pin 27, and the same will readily ride out of either of the depressions 28 or 29, thus allowing the wheels to move independently. However, when one of the plungers is engaged with the boss 26 the day-wheel, moving around the loose pin 27, will ride up on the rounded end 25 of the plunger, and thus be forced into engagement with one of the depressions 28 or 29, thereby locking the hour-wheel and the day-wheel together, so that as long as the loose pin engages with the plunger the hour-wheel and the day-wheel will have equal movements or move together. By this arrangement every time the hour-wheel is moved one hour the day-wheel is moved one day. When one of the plungers 23 engages with the boss 26, the loose pin 27 will be driven into the depression 29, and the parts will be so arranged that this will occur when the thirtieth day of the month arrives or when the numeral 30 appears at the indicating-point. The rounded ends 25 of the plungers 23 are of such length as to lock the day-wheel and the hour-wheel together for one hour. Thus the day-wheel will be moved with the hour-wheel so as to bring the numeral 1 of the first day of the month into view at the indicating-opening, (not shown,) when the plunger will ride off of the pin and allow the same to ride out of the depression 29 and the parts to operate in their normal manner. The depression 28 is always encountered by the pin 27 or the depression 29; but the pin will not be locked in the depression 28 except when the plunger 24 arrives opposite the boss 26, which, owing to the increased width or length of its end, will force the pin 27 into the de-

pression 28 and lock the day-wheel and hour-wheel together for three hours, so as to cause the numerals 29, 30, and 31 to move past the indicating-opening (not shown) and the numeral 1 brought into view, when the plunger will ride out of contact with the pin 29 and allow the same to pass out of the depression 28. This latter operation, it will be understood, occurs only at the end of the month of February.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a time-indicating mechanism, the combination with a minute-wheel, an hour-wheel provided in its side with a depression, a day-wheel and a month-wheel, and a fixed projection supported in juxtaposition to the month-wheel, of a plurality of plungers carried by the month-wheel adapted to intermittently engage with the fixed projection, a pin carried by the day-wheel and arranged to be engaged by one of the plungers and forced into engagement with the depression of the hour-wheel to lock the hour-wheel to the day-wheel when the said plunger engages with the fixed projection.

2. In a time-indicating mechanism, a day-wheel formed on its periphery with symbols for indicating the days in each month and provided with a projection on its side, a month-wheel provided on its periphery with symbols for indicating the twelve months of the year and provided on its side adjacent to the day-wheel with twelve projections adapted to intermittently aline with the projection of the day-wheel, means connected to the month-wheel for imparting motion thereto, and a device arranged between the said wheels normally standing in the path of one of the projections of the month-wheel to hold the same against rotation and adapted to be engaged by the projection of the day-wheel to release the month-wheel to allow the same a partial movement, but so constructed and arranged as to prevent the month-wheel from moving more than a twelfth of a revolution.

3. In a time-indicating mechanism, a plurality of wheels comprising a day-indicating wheel having depressions in its side, an hour-indicating wheel carrying a sliding pin adapted to engage in the depressions of the day-wheel and a month-indicating wheel carrying a plurality of plungers so positioned as to operate at the end of the months of April, June, November and September and an elongated plunger so positioned as to operate at the end of the month of February, and means associated with the month-wheel to operate the plungers at the ends of the months of April, June, November and September to cause the sliding pin to engage in one of the depressions of the hour-wheel to lock the said wheel and the day-wheel together for simultaneous

movement and also to operate the elongated
plunger at the end of the month of February
to cause the sliding pin to engage with one of
the other depressions in the hour-wheel to
5 click the said wheel and the day-wheel to-
gether for a prolonged simultaneous move-
ment.

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

ELAH TERRELL.

Witnesses:

A. L. PHELPS,
M. B. SCHLEY.