

J. F. ENGLE.
ELECTRIC CLOCK.

APPLICATION FILED MAY 13, 1912.

1,064,137.

Patented June 10, 1913.

2 SHEETS-SHEET 1.

Fig. 1

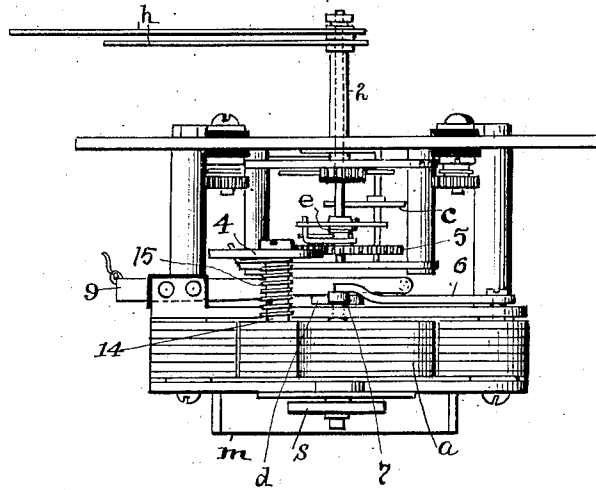
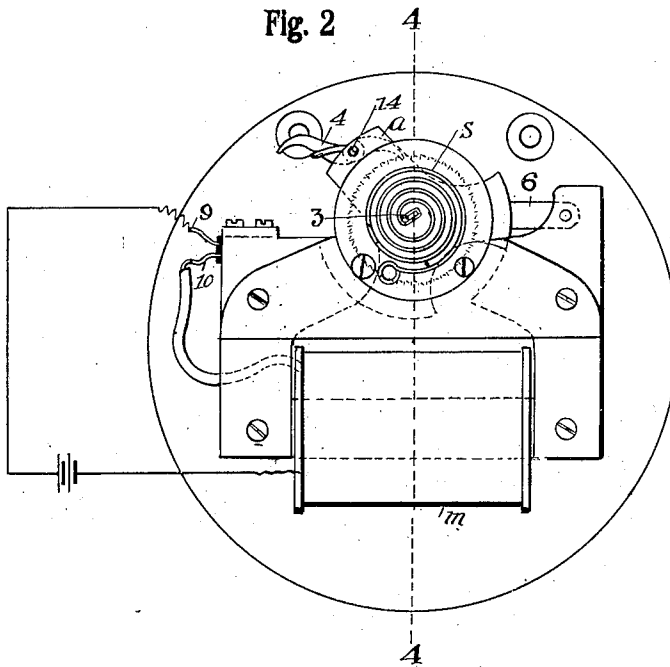


Fig. 2



ATTEST

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Fig. 3

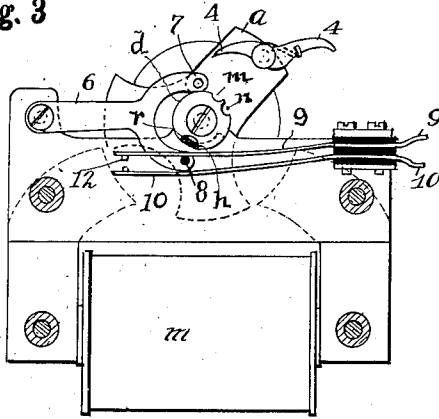


Fig. 4

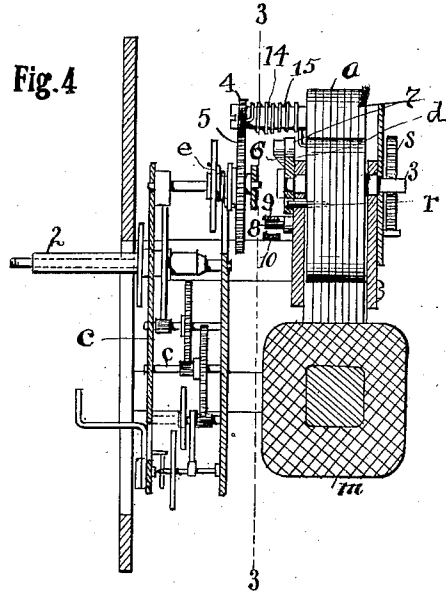
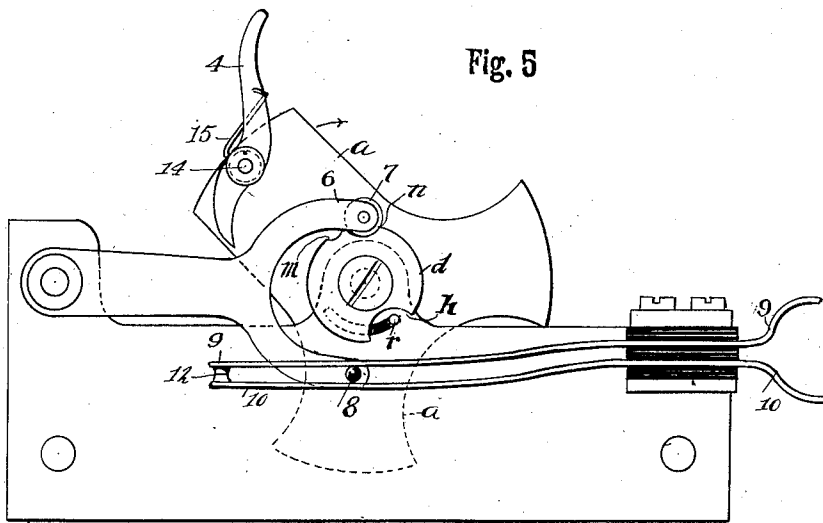


Fig. 5



ATTEST

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JOHN F. ENGLE, OF CLEVELAND, OHIO, ASSIGNOR TO LEE M. PARKER, OF CLEVELAND, OHIO.

ELECTRIC CLOCK.

1,064,137.

Specification of Letters Patent.

Patented June 10, 1913.

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To all whom it may concern:

Be it known that I, JOHN F. ENGLE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Electric Clocks, of which the following is a specification.

This invention relates to a self-winding electrical clock, and the invention consists in the construction and arrangement of parts substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my improved mechanism, and Fig. 2 is a side elevation thereof. Fig. 3 is a side view of the electrical parts more particularly looking to the right from line 3—3, Fig. 4. Fig. 4 is a sectional elevation on a line corresponding substantially to 4—4, Fig. 2. Fig. 5 is a side elevation of the armature and parts associated therewith and enlarged over the preceding figures but corresponding otherwise to Fig. 3 except that the circuit is closed in this view, whereas in Fig. 3 it is open.

In the mechanism as thus shown no claim for novelty is made except in those portions which have to do with the application and use of electricity for keeping the clock properly wound, and this mechanism necessarily comprises the main spring *s* by which the clock is driven and the means for automatically and intermittently or repeatedly at brief and regular intervals winding said spring and holding it at what may be termed a normal tension, the unwinding in any interval being but slight and hence requiring but little winding at any time. I say normal and uniform because the rewindings are so frequent and complete as not to permit the spring to unwind perceptibly before it is re-wound and so on continuously or until the source of electrical energy is exhausted. Usually a suitable dry battery is installed with the clock, and a magnet *m* and the average battery has a life of six months or longer.

The armature is indicated by *a* and is located within the poles of the magnet as usual and fixed on shaft 3, and the magnet is energized and the mechanism operated through said magnet at intervals as will now be seen. Thus, the clock mechanism, which is indicated as a whole by *c*, has the usual arbor 2 and hour and minute hands *h*, and

is operated by the main spring *s* as usual. As an additional spring is needed to tide over the short operating delays incident to the rewinding of the main spring, it is placed at *e*. Operation of the clock mechanism is through the armature *a*, and a pawl 4 thereon adapted to engage a gear wheel 5 of the clock mechanism. Now, since the armature thus serves directly as a means for driving the clock and effects this movement through the wheel 5 by means of pawl 4, it follows that the said parts must rotate together. Incident to this operation I employ a so-called yoke 6, which has a rigid arm pivoted at its outer end so as to afford a vibrating or raising and lowering movement of sufficient stroke for the yoke and which has to do directly with the making and breaking of the electric circuit through which the armature is actuated and the spring *s* rewound. To this end the said yoke has a roller or wheel 7 in one arm and a laterally extending pin 8 in the other arm which reaches between the two contact members or strips 9 and 10. The electrical connections to the battery are with these strips, and the said strips have contact lugs or points 12 on their ends oppositely and adapted to make and break the circuit as the said strips themselves are separated or brought together. Naturally or without interposition the said contacts would meet because the said strips or pieces 9 and 10 are of spring metal and arranged to spring together, and they are separated or spread apart mechanically and for a given or predetermined period through the action of the said yoke and a disk *d* independently rotatable on the inner end of armature shaft 3. The said disk has three several cavities in its periphery as indicated by *h*, *m* and *n*. The cavity *h* is largest and is in working relations with a pin *r* which projects laterally from the armature through a segmental slot in the intervening wall into the said cavity or recess *h* and by engaging the edge thereof causing the said disk to turn on its axis, first in one direction and then in the other according to the rotation or throw of the armature. For example, suppose the parts to be in what may be regarded as their normal position, as when the spring has been wound, Fig. 3, the roller 7 will then be on the circular edge of the disk *d* back of the cavities *m*, *n*, and at such elevation as to

raise or lift the upper contact strip 9 up sufficiently high to separate the contact points 12 and break the circuit. This is the opposite position of the parts from what is seen in Fig. 5 where the circuit is closed. The said disk will hold this position until the armature is rotated far enough by spring *s* to cause the pin *r* to traverse the recess *h* to the opposite edge, and striking said edge, rotate the disk far enough to carry the roller 7 first into the cavity *m* and then directly into *n*, at which latter point the yoke will drop far enough down to allow the contact points to come together and close the circuit. This of course is only a momentary or instant operation, and being done the armature will be instantly rotated forward a limited distance and cause an equivalent winding of the main spring, and the pawl 4 will slide back over the ratchet teeth on wheel 5 correspondingly. Of course this action is exceedingly brief and practically noiseless, and it is in this interval that a supplemental spring may be employed to tide over the action of the clock to avoid any possible break in movements. However, it is also claimed that there really is no lost motion which affects the operation of the clock at these times.

It will be noticed that the contacts are direct acting and made and broken mechanically, the spring in metallic strip 9 closing the circuit when separation is relieved by projection 8. A lateral projection 14 or stud carries the pawl 4, and a spring 15 wound thereon holds the pawl down to work. The moment roller 7 rides over the high point between the two cavities *m* and *n*, a sudden dropping of the roller into cavity *n* is effected by the accommodating independent rotation of disk *d*,—the curved incline of the cavity acting cam-like to rotate the disk under the strong down-pull of spring strip 9 upon the yoke 6 and its pin 8. This pin is preferably of insulating material, say fiber.

What I claim is:

1. An electrically operated clock comprising a main spring, a shaft actuated thereby and an armature fixed on said shaft, in combination with two spring conducting members having contact points at their ends, a pivoted yoke having one arm provided with a lateral projection permanently engaged between the said springs and adapted to separate the same and break the circuit, and a device mounted to rotate loosely on said shaft supporting the other arm of said yoke and adapted to raise and lower said yoke and thus make and break circuit at said con-

tact points, the said disk having cavities in its periphery over which said arm is adapted to pass.

2. An electrically operated clock mechanism comprising a shaft and an armature and a main spring fixed on the said shaft, a disk independently mounted on said shaft and said armature provided with a lateral projection adapted to engage and rotate the said disk, in combination with a pair of direct acting contact springs having contacts at their ends and a pivotally mounted yoke having one arm operatively engaging the periphery of said disk and the other arm provided with a lateral projection extending between said springs inward from the contact points on the ends thereof.

3. In an electrically wound clock, a main shaft and a main spring and an armature on said shaft, a yoke having a supporting stem on which it is pivoted and provided with two arms, a disk adjustably mounted on said shaft having two cavities and a projection between the same, a pair of parallel spring contact members having contact points at their otherwise free ends, and one of said arms having a lateral projection engaged between the said spring contact members and the other of said arms engaging said disk and adapted to ride from one of said cavities into the other over said projection between said cavities and a lateral projection on said armature adapted to engage and rotate the said disk.

4. In an electrically operated clock, a mechanism comprising an arbor and a main spring and an armature thereon, a pair of spring contact members having contact points at their ends, a disk independently rotatable on said arbor and having two cavities of different depths on its periphery and a projection between said cavities and a single cavity in said disk substantially opposite the said two cavities, a lateral projection on said armature adapted to engage the edge of said single cavity and rotate said disk, and a pivoted yoke having an arm with a roller adapted to ride from one cavity into the other over said projection and another arm having a lateral projection extending permanently between the contact members and the ends thereof and adapted to open the same and break the circuit.

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

JOHN F. ENGLE.

Witnesses:

H. T. FISHER,

E. M. FISHER.