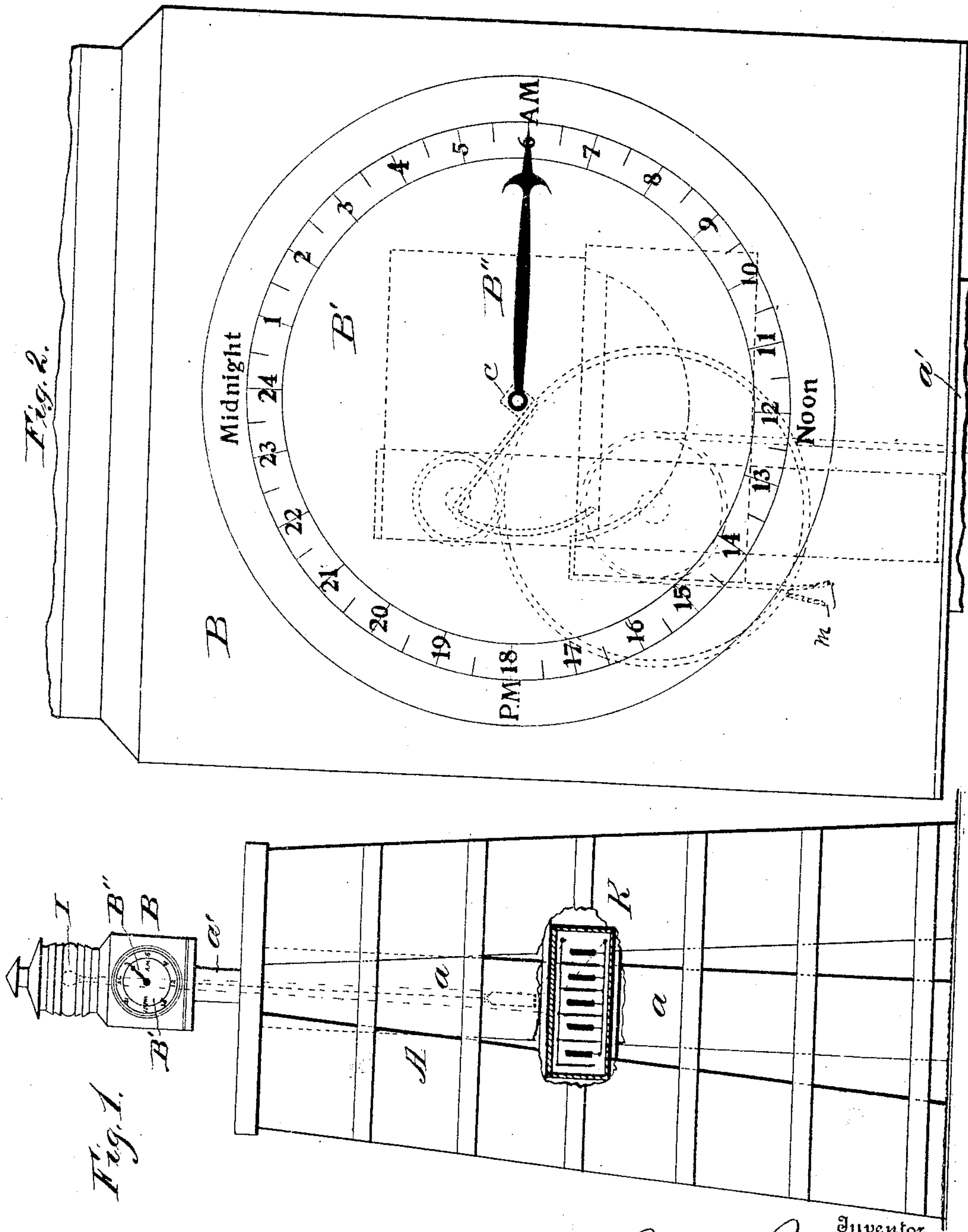


No. 840,646.

PATENTED JAN. 8, 1907.

R. P. NELMS.
ELECTRIC TIME SWITCH FOR BEACONS.
APPLICATION FILED MAR. 20, 1906.

2 SHEETS—SHEET 1.



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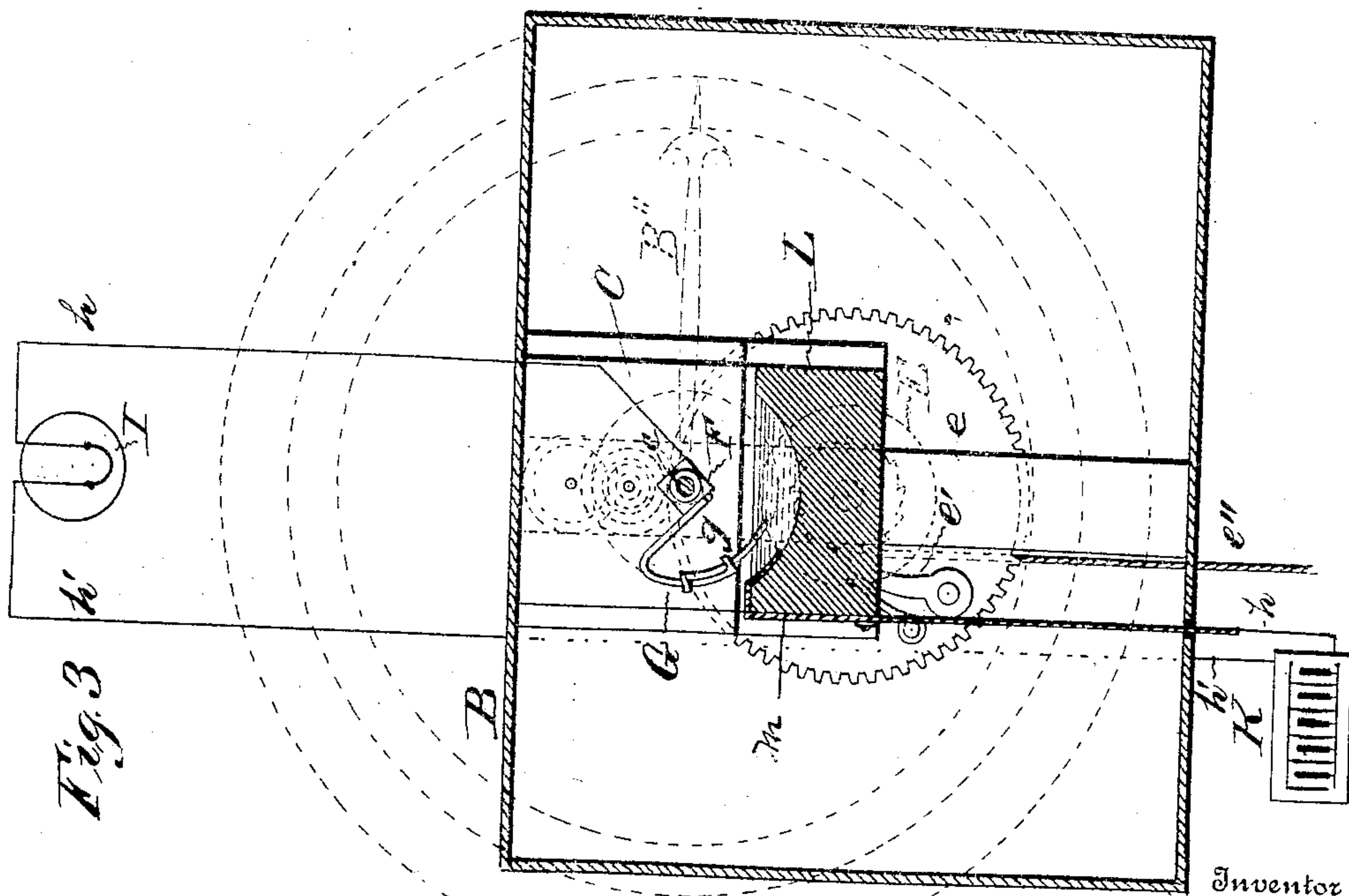
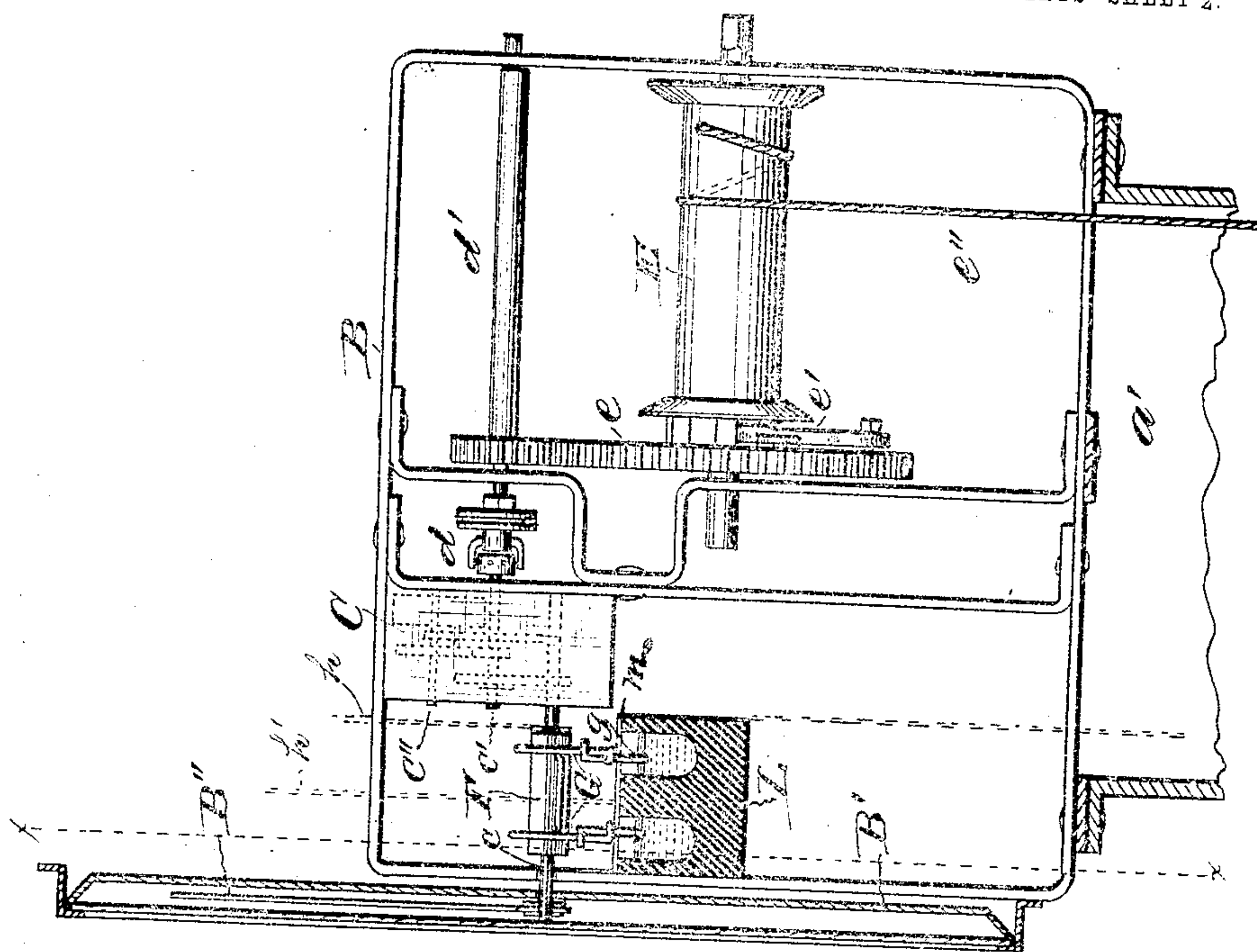
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Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRIC TIME-SWITCH FOR BEACONS.

No. 840,646.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed March 20, 1906. Serial No. 307,125.

To all whom it may concern:

Be it known that I, ROBERT PERRY NELMS, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented new and useful Improvements in Electric Time-Switches for Beacons, of which the following is a specification.

My invention relates to improvements in beacons, the purpose being to provide means whereby an electric lamp may be placed in circuit with a battery during the hours of darkness, the circuit being broken during the hours of daylight, also to provide time-indicating means which coöperates with the circuit maker and breaker.

The invention includes in combination a time-keeping mechanism or clock-movement in which the hand makes a single revolution over a dial in twenty-four hours, the hand-carrying spindle having fast thereon an electrode or an element of a circuit maker and breaker, the power-driven shaft of the time mechanism being connected by a clutch with a weight-actuated or driven drum, so that the spring of the time mechanism will be kept at a constant tension.

The invention also includes an adjustable electrode that may be set to vary the length of time that the circuit is closed to vary the time that the lamp will be lighted to accord with the hours of darkness and light.

The invention also consists in the particular construction and combination of parts, as will be hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a beacon made in accord with my invention. Fig. 2 is a detail front elevation of the dial, the circuit maker and breaker being shown by dotted lines. Fig. 3 is a vertical section on line *x x* of Fig. 4; and Fig. 4 is a vertical section, being taken at right angles to Fig. 3.

The frame or support A for the lamp and time mechanism may be of any suitable construction and carries a vertical tube *a*, in which the weight of the time mechanism is positioned. The frame is also provided with a hollow support *a'* for the casing of the time mechanism and with supports for a box that contains a storage battery.

The hollow support or tube *a'* maintains a casing B, which has on one side a dial B', which is suitably subdivided and marked

from "1" to "24," representing hours, and over the dial moves a hand or pointer B'', that is moved by the time mechanism to make one revolution over the dial in twenty-four hours. The time mechanism is inclosed in a suitable casing, such casing C being secured in the box B. The time mechanism includes a spindle *c*, to which the hand B'' is attached, as well as a winding-shaft *c'* and shaft *c''*, to which is secured one end of the driving-spring *c* of the usual type, as indicated by dotted lines on Fig. 4, of the time mechanism, and in practice the shaft *c'* is connected by a suitable clutch *d* with a driven shaft *d'*, the pinion thereon being engaged by the gear-wheel *e*, that is provided with a pawl *e'* for engagement with a ratchet attached to a drum E, such drum being driven by a cord *e''*, to which a weight is attached. The drum, gears, and weight are so proportioned in relation to the spring of the time mechanism that such spring will be kept wound when the tension of the spring by reason of unwinding in driving the time-train becomes less than normal, and by such arrangement the time mechanism may be better regulated and is kept wound as long as the weight tends to turn the drum, and there is no tendency to retard the movement of the time mechanism when being wound.

The spindle or shaft *c* between the dial and the casing for the time mechanism carries a sleeve F of non-conducting material, and electrically connected with an electrode G, that is carried by the sleeve F, is a wire *h*, which extends to an electric lamp I, another wire *h'* extending from the lamp to the storage battery K. The electrode G comprises a part that is fixedly attached to the sleeve F and is electrically connected with the wire *h*, and this fixed part carries adjustable end members *g g*, there being present loops or eyes which maintain the parts of the electrode in sliding and electric connection. The adjustable electrode provides means whereby by the duration of the contact of the electrode with the medium used to complete the circuit may be varied to accord with the hours of darkness or the time that it is desired that the lamp should be lighted and extinguished.

Beneath the spindle *c* is a receptacle L, made of non-conducting material, such receptacle having chambers in which is placed mercury or quicksilver, the chambers being

concave, so that the expansion and contraction of the mercury under varying temperatures will not materially heighten or lower the level of the mercury in such chambers, and to the receptacle so as to enter the chambers are strips of metal *m*, preferably platinum, such strips being electrically connected to a wire *h'*, that is connected to the battery K. A wire *h* connects the battery with the lamp or series of incandescent lamps I, and as long as the electrode G is in the mercury the circuit will be complete and a visible signal for the beacon will be provided. When the electrode is carried by the time mechanism out of the mercury, the circuit will be broken and the lamps will be extinguished. The time mechanism, including the pointer and the dial, provides for indicating the position of the electrode and the duration of the circuit.

The construction and arrangement of the mechanism provides a beacon which will periodically be lighted and extinguished, and the duration during which the lamp will continue to burn may be varied to accord with the season of the year, and in practice it is proposed to provide a battery, lamps, and clock-winding mechanism which will operate unattended for several months, as the electrode need only be adjusted to change the length of contact to accord with the seasons of the year.

Having thus set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character set forth, time mechanism having the usual means for driving the same, supplemental means for winding the driving means when its power falls below normal, a shaft having thereon a pointer such shaft being driven by the time mechanism, an electrode on the shaft to move in unison with the pointer, an adjustable member attached to the fixed member of the electrode and movable therewith, a receptacle for mercury into which the electrode passes to complete a circuit and electric connections between the electrode; the

mercury in the receptacle therefor; the lamp and a storage battery, substantially as shown. 50

2. In a device of the character described, time mechanism having a fixed dial and a revolvable pointer, a two-part electrode mounted on the shaft of the time mechanism that carries the pointer, one member of the electrode being maintained in slidable engagement with the other member, a receptacle for mercury maintained in the path of the electrode, and connections between the electrode; a lamp, a battery and mercury when placed in the receptacle, for the purpose set forth. 55 60

3. In a device of the character set forth, time mechanism having a driven shaft that carries a pointer or hand, an electrode and contact-points attached to the shaft and insulated therefrom, the electrode carried by the shaft having a part that is concentric to the axis of the shaft, means for increasing or diminishing the length of the concentric portion of the electrode, a receptacle having a concave chamber for mercury, and means for electrically connecting the movable electrode with a lamp, a battery and with mercury placed in the receptacle, for the purpose set forth. 65 70 75

4. In a device of the character set forth, a time-train of gears having means for driving a shaft which carries a pointer one revolution in twenty-four hours, means for maintaining the driving element of such time-train at a constant tension, an electrode carried by the shaft having thereon the pointer and insulated therefrom; the electrode having a member that is maintained in slidable engagement with the fixed member of the electrode to change the duration of an electric circuit, a chamber adapted to contain mercury located in the path of the electrode, electric connections between the electrode; a lamp; a battery and mercury when placed in the receptacle, substantially as shown. 80 85 90

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