

No. 790,267.

PATENTED MAY 16, 1905.

J. & A. N. STEIN.
ELECTRIC CLOCK SYSTEM.
APPLICATION FILED JUNE 22, 1904.

2 SHEETS—SHEET 2.

Fig. 4

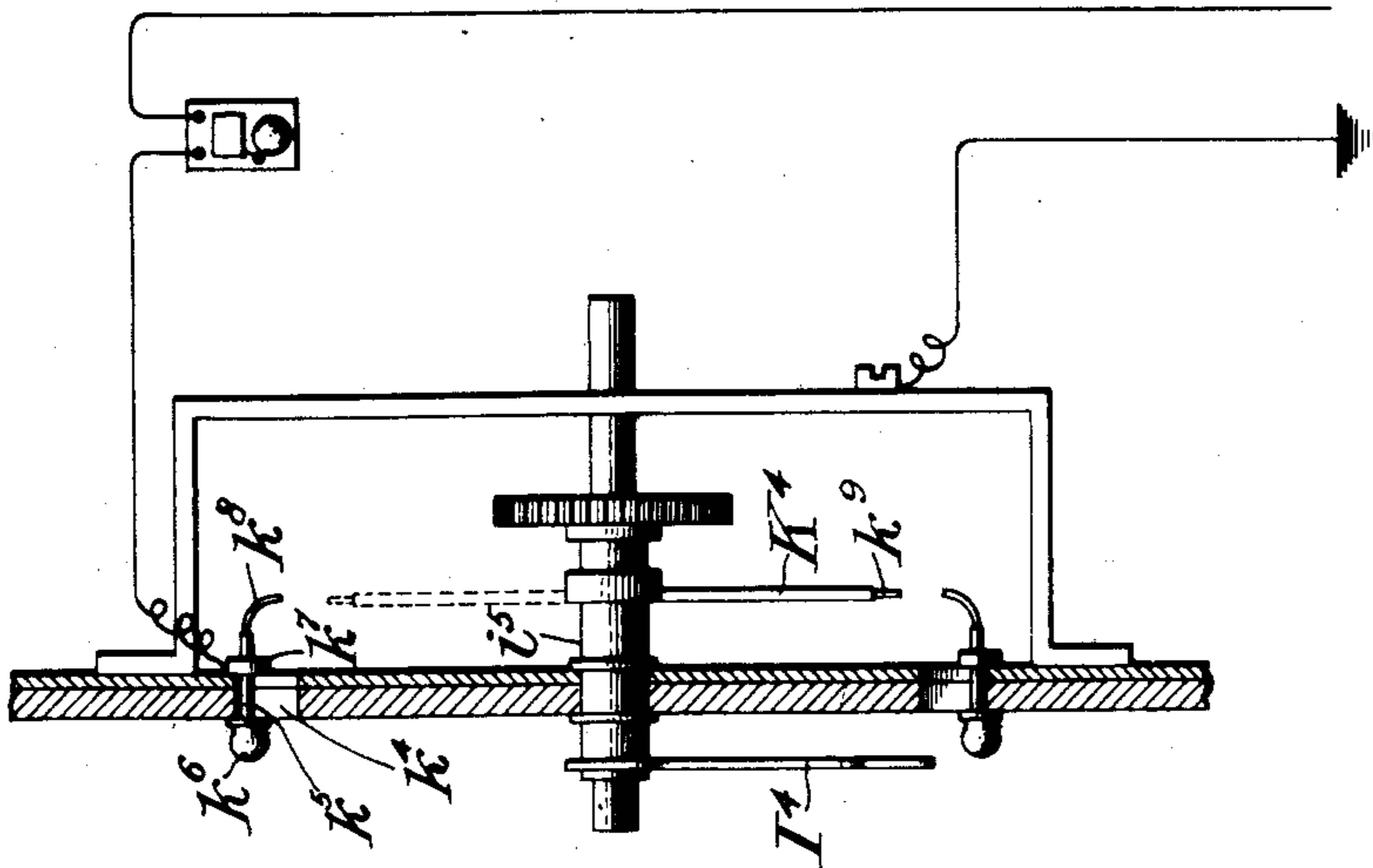
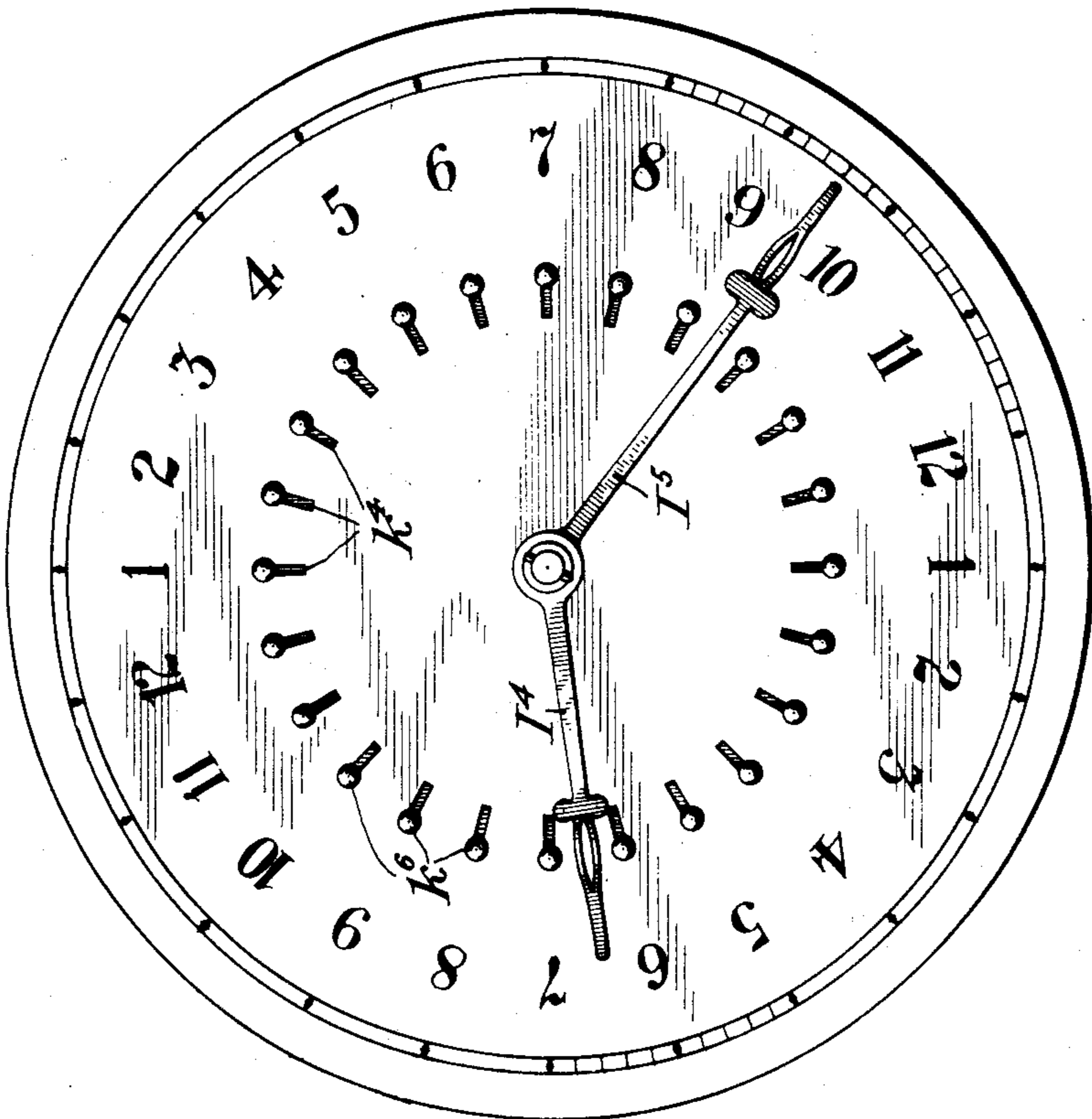


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN STEIN AND ALBERT N. STEIN, OF NEW YORK, N. Y., ASSIGNORS
TO UNIVERSAL ELECTRIC CLOCK COMPANY, OF NEW YORK, N. Y.,
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ELECTRIC CLOCK SYSTEM.

SPECIFICATION forming part of Letters Patent No. 790,267, dated May 16, 1905.

Application filed June 22, 1904. Serial No. 213,638.

To all whom it may concern:

Be it known that we, JOHN STEIN and ALBERT N. STEIN, citizens of the United States, and residents of New York, in the county of New York and State of New York, have jointly invented certain new and useful Improvements in Electric Clock Systems, of which the following is a specification.

This invention relates to electric time systems wherein a master or controlling timepiece of ordinary construction—*i. e.*, spring-actuated and suitably regulated—is employed to induce electrical impulses for the purpose of intermittently energizing the motor-magnets of electromagnetically-operated timepieces in circuit with the master or controlling clock.

Prominent objects connected with the invention are represented by the simplicity of construction and positiveness of operation of the apparatus employed and the provision whereby an audible alarm may be sounded at any predetermined hour by each of the secondary timepieces.

With the above and other purposes in view the invention comprehends the improved system and peculiarly-arranged parts embodied in the subject-matter of the subsequent detailed description and illustrated in the accompanying drawings, in which latter—

Figure 1 is a diagrammatic view illustrating certain details connected with an ordinary clock whereby the same is adapted to uniformly make and break a circuit for the purpose of intermittently energizing the motor-magnets of one or more secondary clocks, one of said latter clocks being disclosed and represented in circuit relation with the primary or associate clock. Fig. 2 is a vertical transverse section of one of the secondary clocks, the plane of section being somewhat to the right of the motor-magnets of said clock and the dial-arm coacting with the alarm mechanism being shown in a different position. Fig. 3 is a face view of the dial portion of one of the secondary clocks and illustrating a modified mechanism. Fig. 4 is a detail sectional view of the construction illustrated in the preced-

ing figure and showing more particularly one of the shifting contacts for hourly closing the alarm-circuit.

Similar reference characters are employed to designate corresponding parts in the several views wherein they occur.

Referring now more particularly to Figs. 1 and 2, A indicates in outline an ordinary timepiece actuated by the spring a^x and suitably regulated, the main arbor a of said timepiece being extended at the rear for the securement thereon of a ratchet-wheel A' , having teeth a' to the number of sixty. Suitably pivoted on this timepiece is a lever B, one end of which has a nose b , while the other end presents a circuit-closing lug b' . It will be observed that the nose b is so configured that it is adapted under the action of a contractile spring b^2 to be normally thrown and retained in engagement with the abrupt edge of one of the teeth a' . A small bracket C has at the extremity of its arm c a short leaf-spring c' , which is so positioned with regard to the lug b' of the lever B that as the ratchet-wheel revolves in the proper direction the inclined backs of its teeth a' will successively vibrate the lever B and result in the lug b' being thrown in contact with the leaf-spring c' with uniform periodicity.

A small metal block d and the somewhat corresponding-shaped base c^2 of the bracket C are electrically connected with the circuit-wires E F, respectively, the contractile spring b^2 being attached to said block d .

As shown, the wire F connects with one of the elements of a battery G, an element of opposite sign of which is connected with a line-wire H. It will be appreciated that the circuit-wires E, F, and H constitute the line, the wire F being employed for the proper inclusion of the battery.

The secondary timepiece I is provided with the customary dial I' , equipped with the hour characters and minute divisions. The main arbor I^2 is shown as being rearwardly extended for the attachment thereon of a ratchet-wheel I^3 , having peripheral teeth to the number of sixty and in reverse relation with re

spect to the teeth of the primary timepiece. This wheel I^3 is intermittently rotated to the extent of one tooth by a spring slip-pawl j on the free end of an armature J , having a spring-tongue connection j' with the end of the angular extremity of a bracket J' , upon which is mounted the electromagnets J^2 . It will be noted that the coils of these magnets are in series with the line-circuit through the medium of the branch wires h h' . Obviously as the line-circuit is made and broken through the vibration of the lever B of the primary timepiece the electromagnets J^2 of each of the secondary timepieces will be alternately energized and deenergized, resulting in such vibration of the armature J as will occasion the slip-pawl to intermittently rotate the ratchet-wheel I^3 to the extent of one tooth at each vibration with a uniformity of movement.

Still considering each secondary timepiece, the forward extremity of the main arbor I^2 carries the minute-hand I^4 , while reducing-gear, (represented by the train i to i^3 , inclusive,) in conjunction with the sleeve i^4 , serves to operate the hour-hand I^5 .

A bearing K , bushed in the dial and in which the main arbor and sleeve i^4 are both revolubly supported, loosely contains the horizontal part k of a hand-operated arm K' , radially disposed in parallel relation with the dial and carrying a forwardly-projecting knob k' for facilitating the circular swinging movement of said arm by hand. Carried by the horizontal part of the arm K' and similarly disposed as said arm, but at the rear of the dial, is a member K^2 , having at its extremity a rearwardly-extending contact projection k^2 . A rod K^3 , having its inner end seated in the sleeve i^4 , is adapted to partake of the movement of said sleeve, so as to describe a circular sweep or path of travel. At the free extremity of said rod K^3 is a small forwardly-bent leaf-spring k^3 .

On a stud l at the lower forward part of each secondary clock is pivotally hung a hand-operable circuit-closing lever L , which latter is adapted to be thrown in contact with a stud l' , located in juxtaposition with respect to said lever. The stud l has a circuit connection L' with the arm K^3 and continuing through the sleeve i^4 connects by a wire L^2 with the coils M of the electromagnets, adapted to actuate the bell M' , the return being made through the branch wire L^3 to one of the binding-posts N , by which connection is made with the main line. It will be readily comprehended that the bell mechanism is in a loop or derived circuit capable of being partially completed by swinging the lever L in contact with the stud l' . Now by turning the arm K' so that the same and its member K^2 will coincide with the predetermined hour the revolution of the hour-sleeve will ultimately bring the rod K^3 in such position as to cause its spring to contact with the rearward projection of the member K^2 ,

and thereby fully complete the bell-circuit and sound the alarm, the final completion alluded to occurring at the exact period of the predetermined hour. The duration of contact between the rod-spring and the projection of the member K^2 will be about the extent of a minute, which will afford a sufficient alarm without the same being unduly prolonged.

From the foregoing description it will be appreciated that a clock system in accordance with our invention is comparatively simple, but not liable to get out of order. The primary apparatus is the only one which is spring-actuated and suitably regulated, the secondary time piece or pieces being exceedingly simple and depending solely for their actuation upon the electromagnet devices, which in turn are controlled by the primary apparatus. Furthermore, it will be possible to set any of the secondary timepieces for a predetermined alarm irrespective of the other secondary timepieces.

We do not desire to be understood as limiting ourselves to the particular details and arrangements of parts shown and described, but may vary the same to a considerable extent and still be within the scope of our invention. For instance, in Figs. 3 and 4 we have illustrated a modification of the alarm-adjusting devices, such modification involving principally a series of radial slots k^4 , which are shown as being twenty-four in number and corresponding with the twenty-four hour periods of a day and night. In each of these slots is slidably mounted a pin k^5 , having a front projecting head k^6 , by which it can be conveniently shifted in its slot. At the inner side of the dial each of the pins has a disk k^7 for retaining it against withdrawal. Also at the inner side of the dial each of the pins has a small bent tongue k^8 . The hour-sleeve i^5 carries a rod K^4 , on the free extremity of which is a spring-tongue k^9 . It will readily be seen that each pin can be inwardly shifted in its slot, having a direct relation with one of the twenty-four hour divisions of the day, so that when the spring-tongue k^9 of the rod K^4 is brought in contact with the tongue of said pin an alarm will be sounded, said contact being coincident with the predetermined hour at which the alarm is to be rung. Any two or more of said pins can be shifted so that the alarm will be successively sounded at the different hours which they represent, and all of said pins can be shifted to cause the alarm to be sounded at periods representing the twenty four hourly divisions of the day.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

In an electric time system, the combination with a spring-actuated primary clock comprising a rotary ratchet-wheel driven con-

stantly by the motor-spring of the clock and
having teeth corresponding in number with
the minor divisions on the clock-dial, of a le-
5 ver pivotally attached to said clock and pro-
vided with a nose, a circuit-contact also at-
tached to said clock, a spring normally main-
taining the nose in engagement with one of
the ratchet-teeth and lever away from said
circuit-contact, a working line having its
10 wires connected with said lever and contact
respectively, an electrically-operated second-
ary clock having its motor - magnet means
included in said working line, an electromag-
netic alarm carried by said secondary clock,

a branch circuit of the working line and in- 15
cluding the magnet means of the alarm, and
hand - adjustable means coactive with said
alarm for predeterminately setting the sound-
ing period of the same.

Signed at New York, in the county of New 20
York and State of New York, this 21st day of
May, A. D. 1904.

JOHN STEIN.
ALBERT N. STEIN.

Witnesses:

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M. BENDER.