

(No Model.)

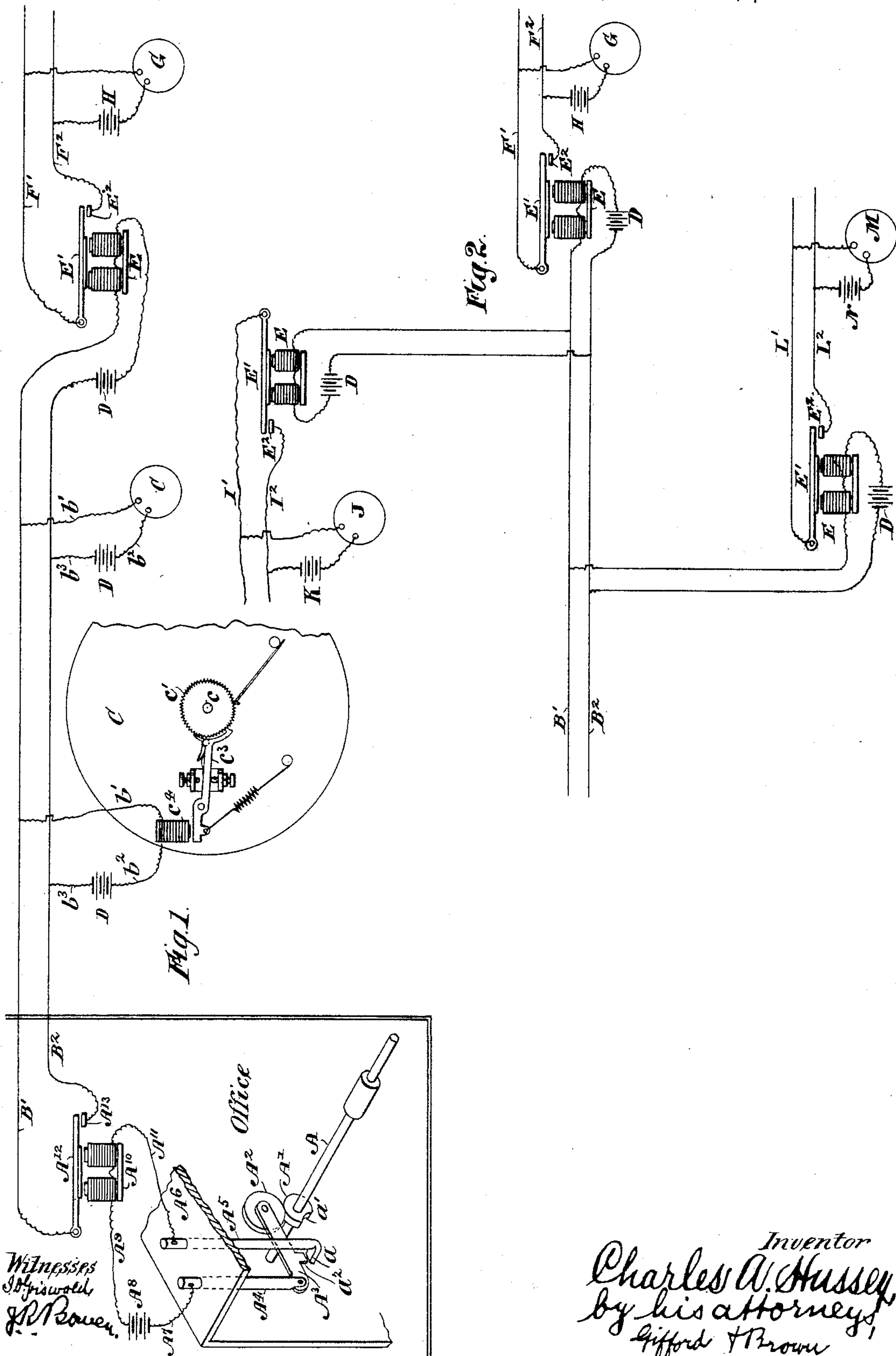
3. Sheets—Sheet 1.

C. A. HUSSEY.

ELECTRIC TIME INDICATING SYSTEM.

No. 350,434.

Patented Oct. 5, 1886.



N. PETERS, Photo-Lithographer. Washington, D. C.

(No Model.)

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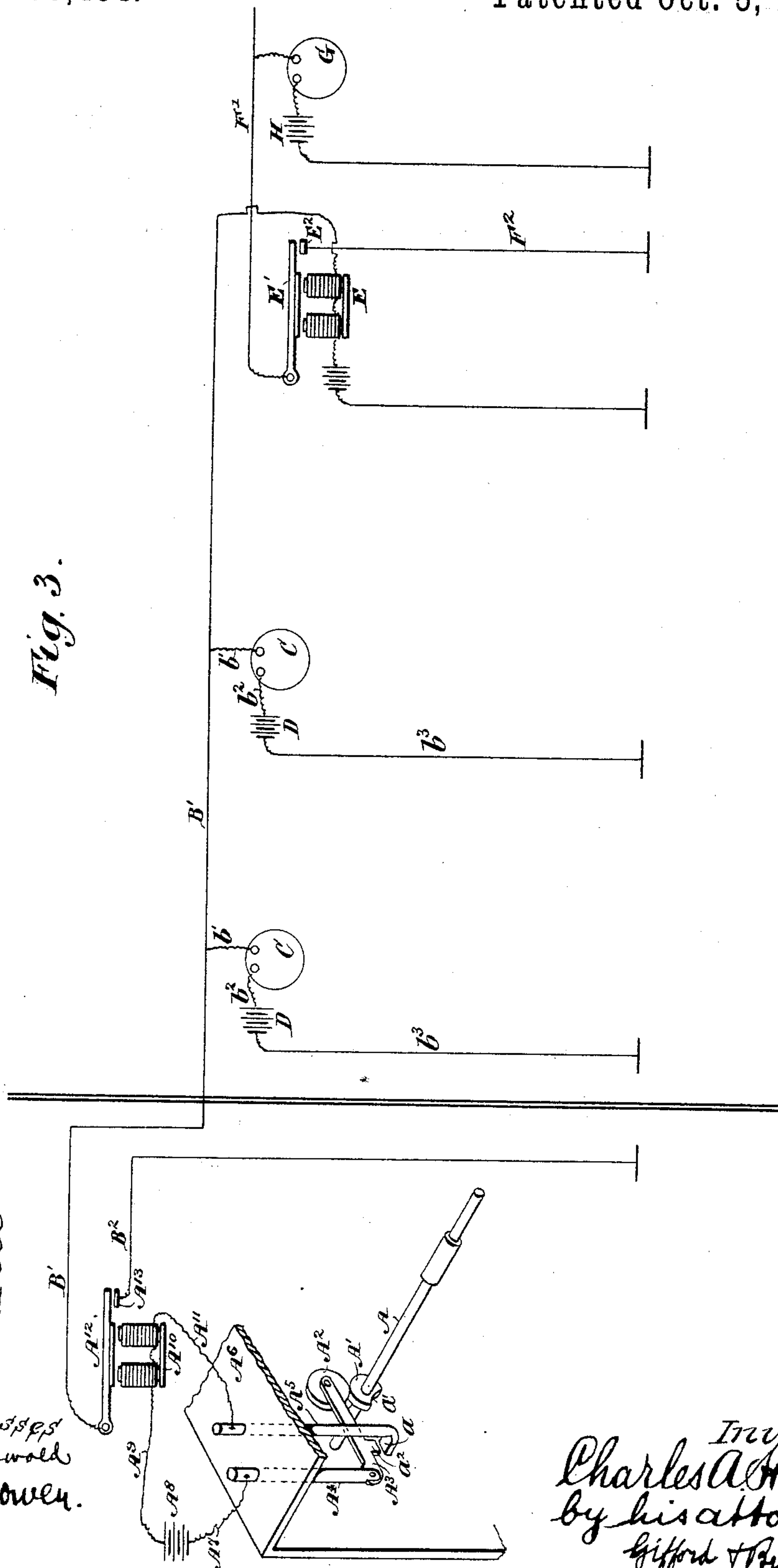
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Fig. 3.



Witnesses
James D. Griewood
Jack Bowen.

Inventor
Charles A. Hussey,
by his attorneys,
Gifford & Brown.

(No Model.)

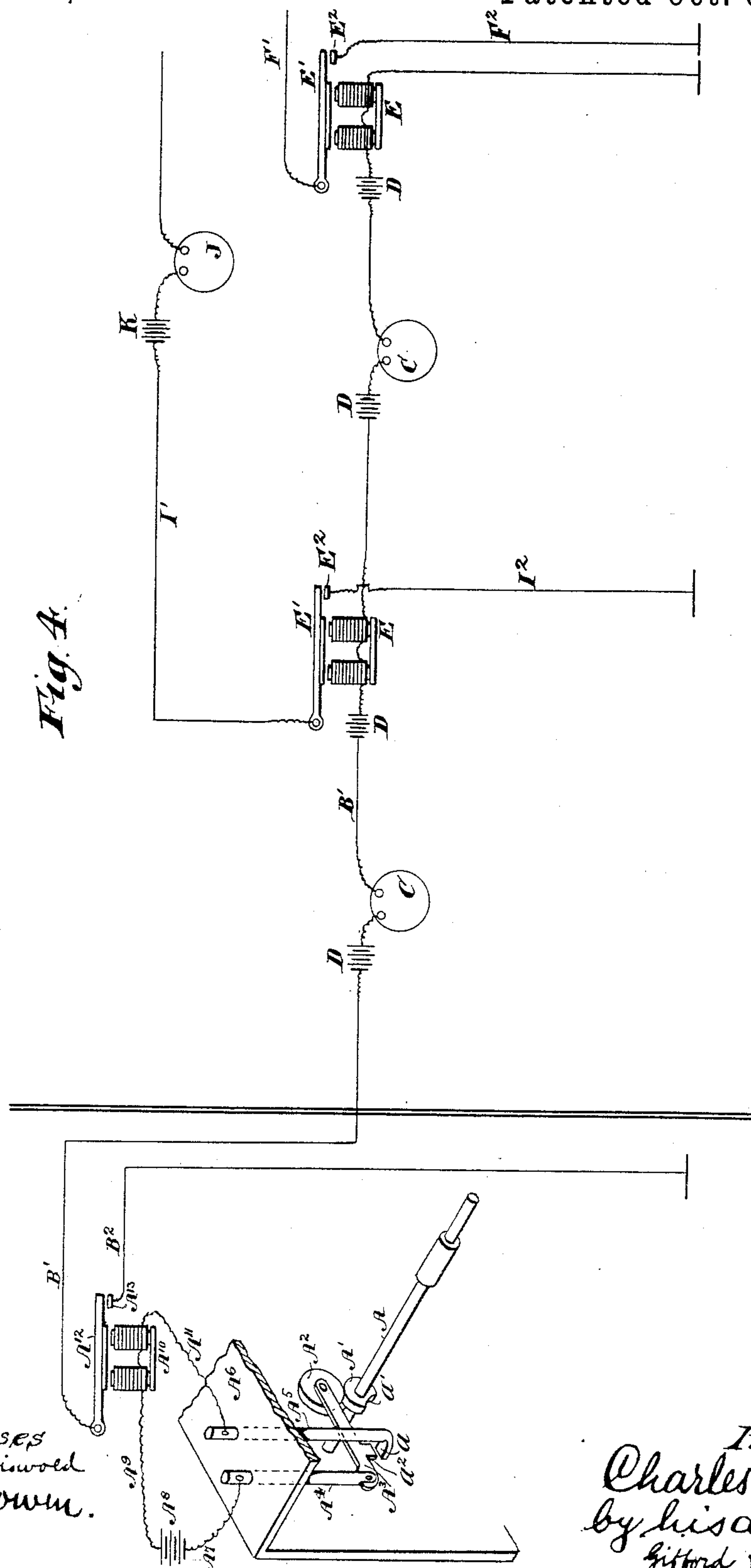
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ELECTRIC TIME INDICATING SYSTEM.

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Office

Witnesses
James D. Griswold
Jas R. Brown.

Inventor
Charles A. Hussey
by his attorneys,
Gifford & Brown

UNITED STATES PATENT OFFICE.

CHARLES A. HUSSEY, OF NEW YORK, N. Y.

ELECTRIC TIME-INDICATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 350,434, dated October 5, 1886.

Application filed June 28, 1886. Serial No. 206,464. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. HUSSEY, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Electric Time-Indicating Systems, of which the following is a specification.

The object of my improvement is to provide for operating any desirable number of secondary or electric clocks in a time-telegraph from a single mechanical clock or regulator.

Heretofore it has been practically impossible to operate a great number of secondary or electric clocks from a single regulator without having so much battery force in circuit as to produce damaging sparking at the contact-points of the regulator. I have devised an apparatus whereby the difficulty is overcome.

I will describe an apparatus or electric time-indicating system embodying the improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view of an electric time-indicating system embodying the improvement, one of the secondary or electric clocks being shown upon a much larger scale than the others for the purpose of illustrating its construction. Fig. 2 is a diagram illustrating my electric time-indicating system, and showing how it may be extended in different directions—as, for instance, through intersecting streets. Figs. 3 and 4 are diagrams illustrating other examples of the improvement.

Similar letters of reference designate corresponding parts in all the figures.

I will first describe the regulator or mechanical clock. It is only partially represented, and such parts as are shown are represented in perspective.

A designates the shaft for a sweep seconds-hand. It is designed to make one complete rotation during each minute. This clock may be operated by a spring or weight. On the shaft A is affixed a wheel, A', having a notch, a', in its periphery. Adjacent to the wheel A' a wheel, A², is arranged. This wheel A² is journaled loosely in a swinging arm, A³, which is pivotally connected to a rod, A⁴. The wheel A² rests upon the periphery of the wheel A'. Whenever the notch a' in the periphery

of the wheel A' comes opposite the wheel A², the latter drops into it, the arm A³ descending with this wheel.

A⁵ designates a rod which has at the lower end an offset or shoulder, a, extending under the swinging arm A³. The arm A³ has a projection, a², opposite the offset or shoulder a of the rod A⁵. When the swinging arm A³ descends, owing to the dropping of the wheel A² into the notch a' of the wheel A', the projection a² makes contact with the offset or shoulder a of the rod A⁵.

The rods A⁴ A⁵ and the swinging arm A³ are to be made of metal. The other parts mentioned may or may not be of metal. The rods A⁴ A⁵ are to be insulated from each other. This may be done by supporting them in a frame of insulating material, A⁶, or by interposing pieces of insulating material between them and the frame, if the latter is not made of insulating material.

I have not deemed it necessary to represent the train of wheel-work between the weight or spring supplying the motive power for the clock and the shaft A, because it may be of any suitable kind.

Having now described the regulator of the electric time-indicating system, I will proceed to explain the circuit shown in Figs. 1 and 2. The rod A⁴ has a wire, A⁷, connected to it. This wire A⁷ leads to one pole of an electric battery, A⁸. A wire, A⁹, extends from the other pole of this battery, and is connected to one end of the coils of an electro-magnet, A¹⁰. A wire, A¹¹, extends from the other end of the coils of this electro-magnet to the rod A⁵. The electro-magnet A¹⁰ is provided with a swinging armature, A¹². From the armature A¹² a circuit-wire, B', extends, and from a contact-point, A¹³, against which the armature A¹² will be vibrated when attracted by the electro-magnet A¹⁰, a wire, B², extends.

C designates the secondary or electric clocks, which are all substantially alike, so that their construction may be understood by reference to the one which is illustrated upon the larger scale. Each electric clock consists of a shaft, c, which will make a complete rotation once every hour. This shaft has affixed to it a wheel, c', having sixty teeth. With this wheel engages a tooth formed at one end of a lever, c², the other end of said lever having affixed

to it an armature for an electro-magnet, c^4 . The ends of the coils of this electro-magnet are connected with binding-posts, from which extend wires $b' b^2$. The electro-magnets c^4 will be energized each time that the contact-points $a a^2$ of the regulator or mechanical clock come together, and the lever c^3 will then move the wheel c' a distance equal to one tooth. The minute-hand, which is affixed to this shaft, will then move the distance which represents a minute on the dial of the clock. Any suitable gearing may be employed to operate the hour-hand shaft from the shaft c . The wire b' leading from each of the clocks C is fastened to the circuit-wire B' . The wire b^2 of each of these clocks C is connected to one pole of a battery, D , whose other pole is connected by a wire, b^3 , to the circuit-wire B^2 . It will therefore be seen that the clocks C and the batteries D are connected to the circuit-wires $B' B^2$ in multiple arc. Each time the circuit-wires $B' B^2$ are electrically connected by the vibration of the armature A^{12} against the contact-piece A^{13} electricity from the several batteries D will flow over the said circuit-wires $B' B^2$, and effect the vibration of the lever c^3 of said clocks. The wires $B' B^2$ form one section of the main circuit. Any desirable number of clocks—as, for instance, twenty—may be arranged in this section of the circuit in manner described. From this section of the main circuit any number of other similar sections may be extended. Wherever another section is to be extended from the section just described, an electro-magnet, E , is connected in multiple arc with a battery, D , to the wires $B' B^2$. Each electro-magnet E will have combined with it an armature, E' , which, when attracted by the electro-magnet, will be vibrated against the contact-piece E^2 . Circuit-wires will extend from the armature E' and contact-piece E^2 , and have connected to them clocks and batteries in the same way that the clocks C and batteries D are connected to the circuit-wires $B' B^2$.

In Fig. 1 I have only shown a single electro-magnet, E , connected with the circuit-wires $B' B^2$. From the armature E' of this electro-magnet and its contact-piece E^2 wires $F' F^2$ extend. These wires $F' F^2$ have electric clocks G and batteries H connected to them in the same way that the clocks C and batteries D are connected to the wires $B' B^2$.

In Fig. 2 I have shown the wires $B' B^2$ provided with two more electro-magnets, E , and batteries D . From the armature E' and contact-piece E^2 of one of these electro-magnets wires $I' I^2$ extend. These wires have electric clocks J and batteries K connected to them in the same way as the clocks C and batteries D are connected to the wires $B' B^2$. From the other of these electro-magnets E wires $L' L^2$ extend, and have connected to them electric clocks M and batteries N , in the same manner as the clocks C and batteries D are connected to the wires $B' B^2$.

It will be evident from Fig. 2 that two sec-

tions of the main circuit may be extended off in different directions—as, for instance, at the intersection of streets. Each of the sections of the main circuit may have other sections extended off from it in the same manner as I have shown sections extended from the first section, consisting of the wires $B' B^2$. It is obvious that a number of circuit-sections may extend in different directions from the office where the regulator or mechanical clock is located. Corresponding poles of the batteries which are used in connection with circuits should be similarly connected with the circuits. Inasmuch as batteries are distributed all along the circuits, the electro-motive force of the circuits will be better balanced than if a single powerful electric battery were used. Moreover, when the batteries are thus distributed along the circuit, it is not necessary for the persons engaged in operating the electric time-indicating system to hire rooms for accommodating the batteries which are necessarily used. Obviously, when an electric time-indicating system is made according to my improvement a single regulator may operate a large number of secondary or electric clocks without the occurrence of any damaging sparking between the contact-points of the regulator.

In the examples of my improvement just described the various sections of the main circuit are complete metallic circuit-sections. In Fig. 3 I have shown similar sections, consisting of single wires, the ground being employed instead of a second wire. In this example of my improvement the secondary or electric clocks and their batteries are connected with the wires forming the circuit-sections and with the ground. The sections of the main circuit are combined, as before.

In Fig. 4 I have shown that the secondary or electric clocks may be connected in series with sections of a main circuit. The several sections of the main circuit are shown as connected with the ground and combined as in the other examples of my improvement.

I have filed an application for patent, numbered 205,562, for an improvement in electric time-indicating systems, (primary clocks,) June 18, 1886, in which I claim special features of construction in said primary clock. I do not herein lay claim to the special construction of said clocks, as they are claimed in said application.

I have also filed an application for patent, numbered 205,849, for an improvement in electric or secondary clocks, June 18, 1886, in which I claim special features of construction of a secondary clock. I do not herein lay claim to the special construction of said clocks, as they are claimed in said application.

I have filed an application for Letters Patent for an improvement in electric time-indicating systems, numbered 201,400, May 6, 1886. In that application I show a primary clock, line-wires leading from said clock to electro-magnetic mechanism for reversing the directions of the current, a battery for supplying electricity

to said line-wires, other line-wires leading from
 said reversing mechanism to secondary clocks,
 an electro-magnet in circuit with the wires
 leading from the reversing device for operat-
 5 ing the hour and minute hands, and another
 electro-magnet in circuit in said line-wires for
 operating a calendar. In said application I
 also show in circuit with the electro-magnets
 in the secondary clock, and also with the line-
 10 wires leading thereto, a circuit-changing de-
 vice whereby when the current is reversed by
 the reversing mechanism the electro-magnets
 in the secondary clock will be alternately mag-
 netized. In said application I also show a
 15 supplemental battery and an electro-magnetic
 mechanism operated by the main battery to
 connect the supplemental battery with the
 line-wires in a manner to supply a current of
 electricity in the same direction as the main
 20 battery. In said application I also show hand-
 keys and connections in circuit with the sec-
 ondary clocks and the primary clock for set-
 ting the secondary clock. I do not in the
 present application claim, broadly, the electric
 25 time-indicating system therein claimed.

I have filed an application for Letters Patent
 for an improvement in electric time-indicating
 systems, numbered 205,564, June 18, 1886. In
 this application I show a primary clock or reg-
 30 ulator having two circuit-closing mechanisms,
 line-wires adapted to form two circuits, and an
 electric or secondary clock having two electro-
 magnetic mechanisms for operating different
 parts. In this application I also show electro-
 35 magnets having their armatures connected
 with certain of the line-wires, a main battery
 for supplying electricity to the line-wires con-
 nected at one pole with contact-pieces, against
 which the said armatures will be vibrated when

the electro-magnets are energized, and con- 40
 nected at the other pole to one of the line-
 wires which is not connected with the arma-
 tures, and local circuit-wires connected to the
 coils or wires of the electro-magnets and ex-
 tending to circuit-closing mechanism in the 45
 primary clock or regulator. In this applica-
 tion I also show a supplemental battery and
 electro-magnetic mechanism for connecting
 the supplemental battery with either of the
 two circuits, as circumstances may require. 50
 I do not in this application lay claim, broadly,
 to the electric time-indicating system therein
 claimed.

What I claim as my invention, and desire to
 secure by Letters Patent, is— 55

1. In an electric time-indicating system, the
 combination of a regulator or mechanical
 clock, a main circuit controlled by said regu-
 lator and composed of a number of sections,
 secondary or electric clocks, and a battery for 60
 each connected together in these sections, and
 electro-magnetic closers arranged in the sec-
 tions from which others extend, substantially
 as specified.

2. In an electric time-indicating system, the 65
 combination of a regulator or mechanical
 clock, a main circuit controlled by said regu-
 lator and composed of a number of sections,
 secondary or electric clocks, and a battery for
 each connected together in multiple arc in said 70
 sections, and electro-magnetic closers arranged
 in the sections from which others extend, sub-
 stantially as specified.

C. A. HUSSEY.

Witnesses:

JAMES S. GREVES,
 GEO. WADMAN.