(No Model.)

2 Sheets—Sheet 1.

C. A. HUSSEY.

PRIMARY ELECTRIC CLOCK.

No. 350,431. Patented Oct. 5, 1886.

Fig. 1

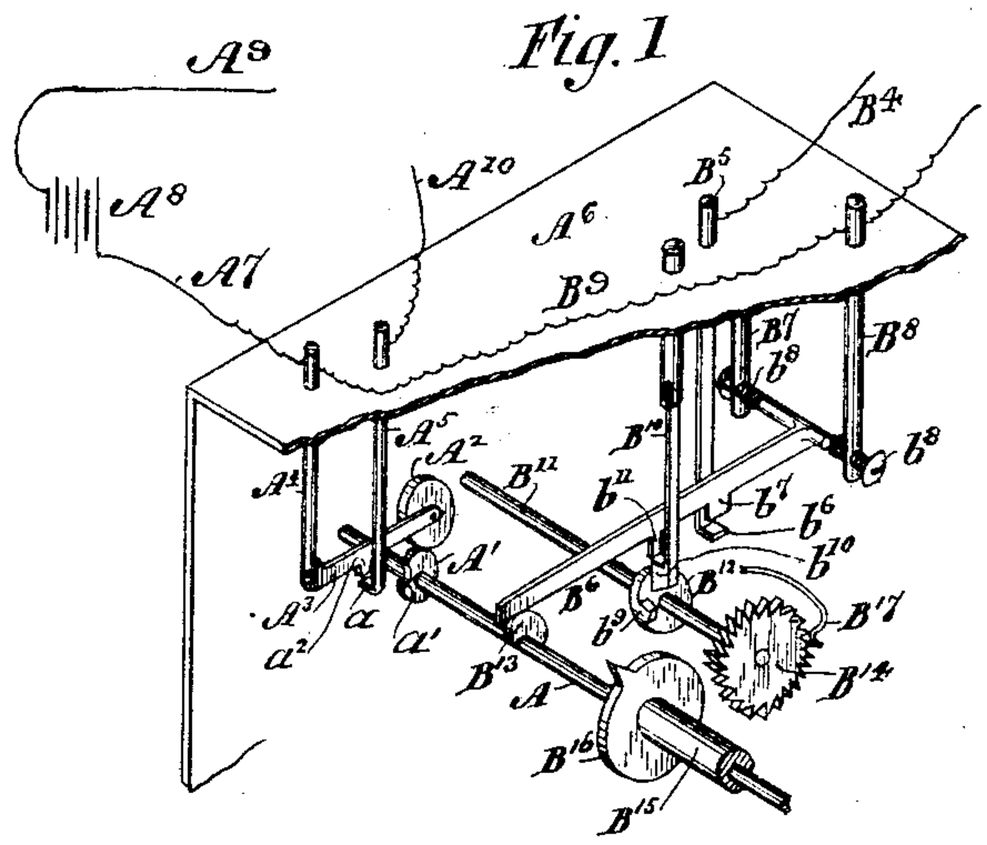


Fig. 4.

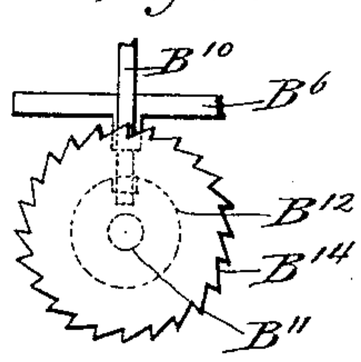
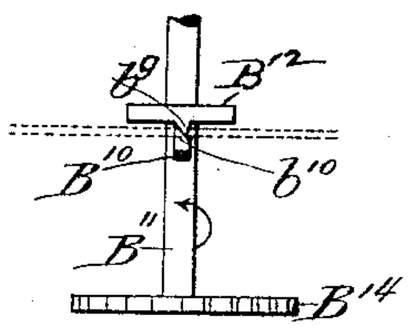


Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

C. A. HUSSEY.

PRIMARY ELECTRIC CLOCK.

No. 350,431. Patented Oct. 5, 1886.

Fig. 2

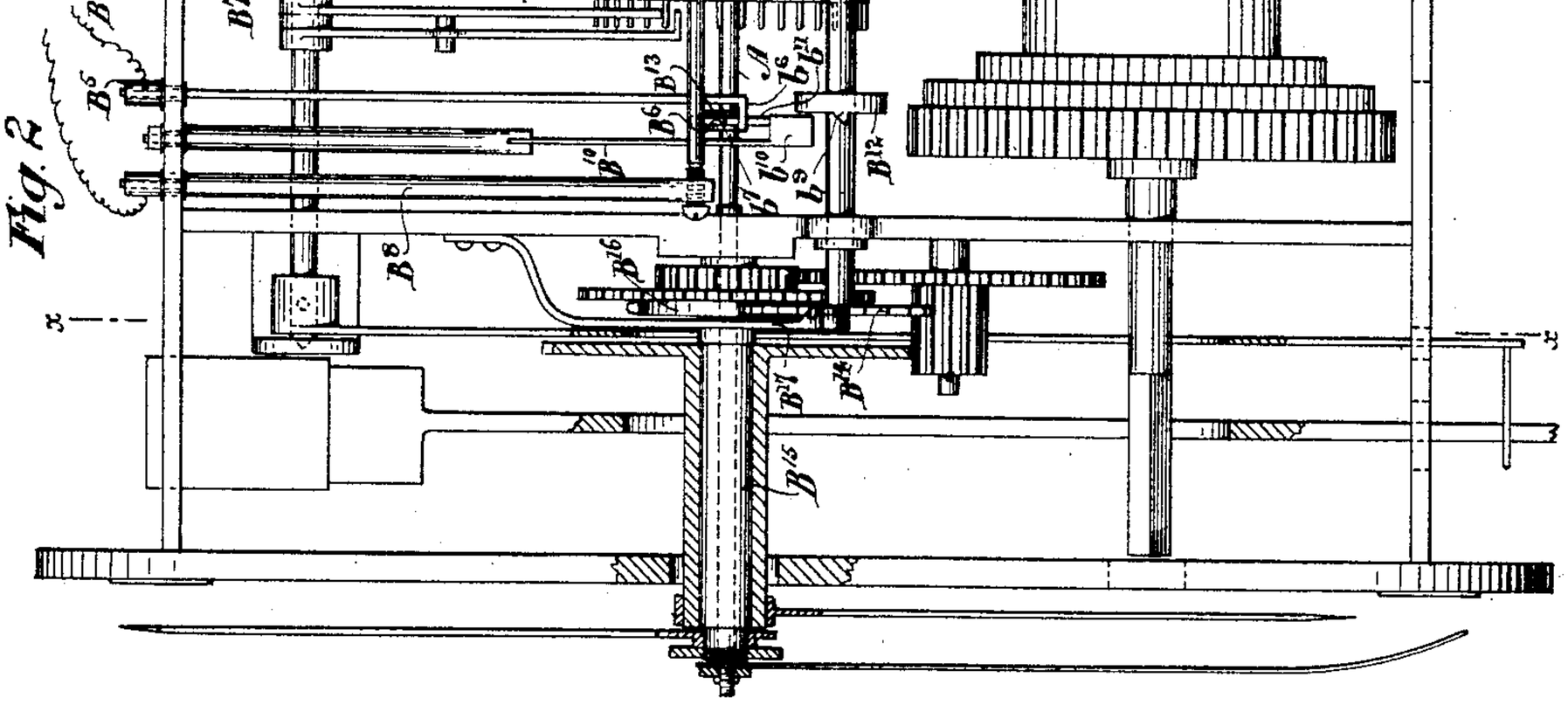
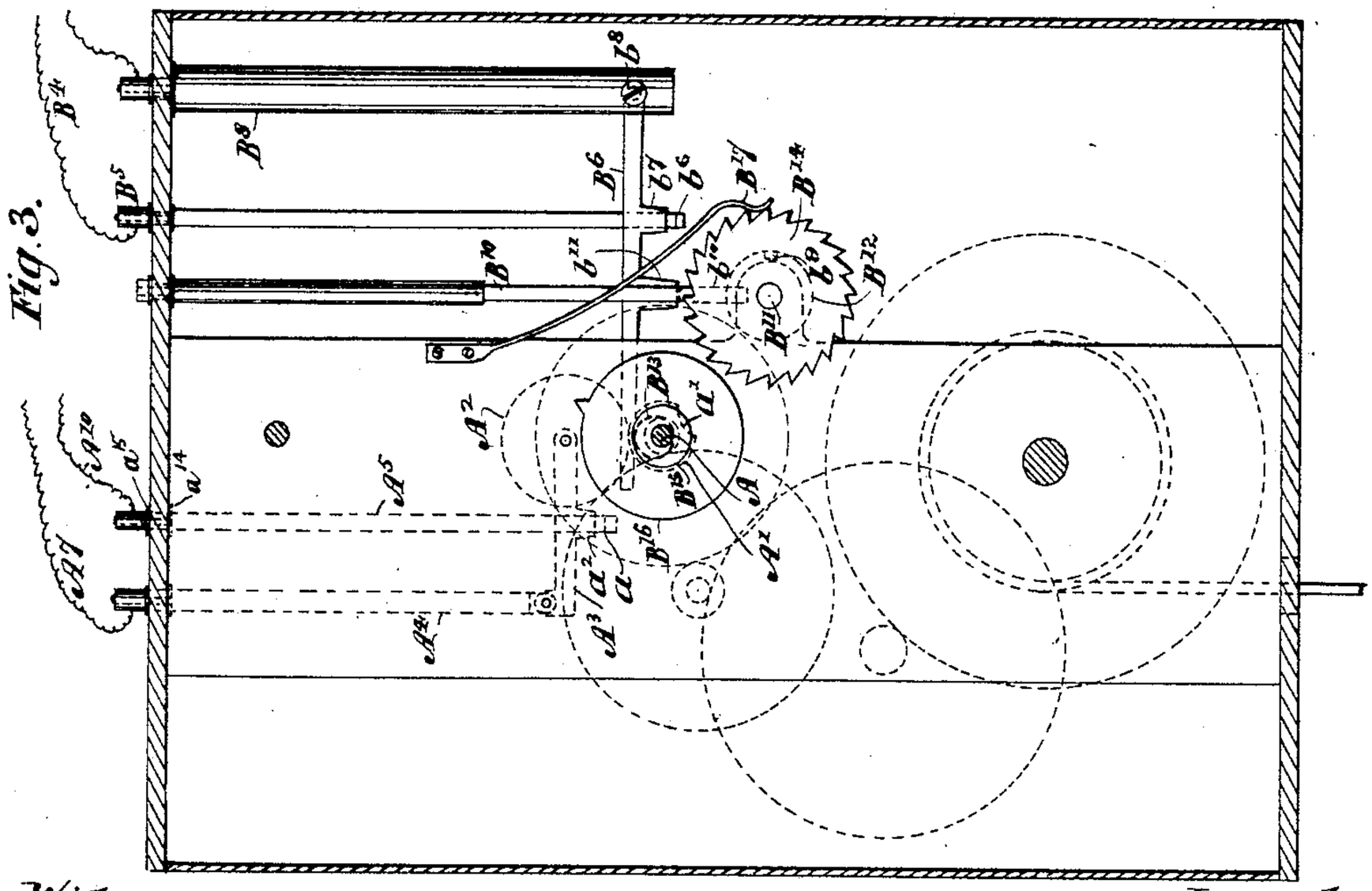


Fig. 3.



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UNITED STATES PATENT OFFICE.

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

PRIMARY ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 350,431, dated October 5, 1886.

Application filed June 18, 1886. Serial No. 205,562. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. HUSSEY, of New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in a Primary Clock or Regulator for Use in an Electric Time-Indicating System, of which the following is a specification.

I will describe a primary clock or regulator embodying my improvement, and then point out the various novel features in the claims.

In the accompanying drawings, Figure 1 is a perspective view of parts of a primary clock or regulator embodying my improvement. Fig. 2 is a side view, partly in section, of this clock or regulator. Fig. 3 is a section of the clock or regulator, taken at the plane of the dotted line *x x*, Fig. 2, and looking rearwardly. Fig. 4 is an elevation, and Fig. 5 a plan view, of a detail.

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

A designates the sweep second-arbor in a primary mechanical clock or regulator. This clock or regulator may be of any suitable kind and operated by a weight. The shaft A, it must be understood, makes one complete rotation during each minute. On the shaft A is affixed a wheel, A′, having a notch, *a′*, in its periphery. Adjacent to the wheel A′ a wheel, A^2, is arranged in the primary clock or regulator. As shown, the wheel A^2 is journaled loosely in a swinging arm, A^3, which is pivotally connected to a rod, A^4, located in the primary clock or regulator. The wheel A^2 rests upon the periphery of the wheel A′. Whenever the notch *a′* in the periphery of the wheel A′ comes opposite the wheel A^2, the latter drops into it. The arm A^3 of course descends with the wheel A^2 when the latter drops into the notch.

A^5 designates a rod in the primary clock or regulator, which has at the lower end an offset or shoulder, *a*, extending under the swinging arm A^3. As shown, the arm A^3 has a projection, a^2, opposite the offset or shoulder *a* of the rod A^5. When the swinging arm A^3 descends on the dropping of the wheel A^2 into the notch *a′* of the wheel A′, the projection a^2 makes contact with the offset or shoulder *a* of the swinging arm A^3.

The rods A^4 A^5 and the swinging arm A^3 are to be made of metal. The other parts which I have mentioned may or may not be of metal. The rods A^4 A^5 are to be insulated from each other. This may be done by supporting them in a frame of insulating material, A^6, or by interposing pieces of insulating material between them and the frame, if the latter is not made of insulating material. The rod A^4 has connected to it a wire, A^7, which extends to one pole of an electric battery, A^8. From the other pole of the battery A^8 a wire, A^9, extends. A wire, A^{10}, extends from the rod A^5.

Whenever the swinging arm A^3 descends in the manner which I have explained, and its projection a^2 makes contact with the offset or shoulder *a* of the rod A^5, the wires A^{10} and A^7 are in electrical communication. This electrical communication will be only momentary, owing to the fact that the notch *a′* of the wheel A′ is of very slight extent. The notch is preferably so short in the direction of the periphery of the wheel A′ that the contact of the projection a^2 of the swinging arm A^3 with the offset or shoulder *a* of the rod A^5 will exist only for two seconds during each rotation of the sweep second-shaft A.

The rod A^5 is adjustably supported. In the present instance it extends through the frame A^6, and is screw-threaded at the portion which extends through the frame. Above and below the frame A^6 nuts a^{14} a^{15} are applied to the screw-threaded portion of this rod. By adjusting these nuts the rod may be raised or lowered. Thus the duration of the contact between the projection a^2 of the swinging arm A^3 and the shoulder *a* of the rod A^5 may be regulated. The shoulder *a* is therefore an adjustable contact-piece. The rod A^4 may be supported like the rod A^5.

The wires A^9 A^{10} form part of a circuit, which, in conjunction with certain contrivances, serves to effect the operation of one part of the electric or secondary clocks which are employed. This circuit will be normally closed each time that the swinging arm A^3 is allowed to drop, so that its projection a^2 will make contact with the offset or shoulder *a* of the rod A^5.

B^5 designates a rod arranged in the primary clock or regulator, and preferably supported like the rod A^5. It is to be made of metal, and has at the lower end an offset or shoulder, b^6.

B⁶ is a swinging arm made of metal and having a projection, b^7, opposite the offset or shoulder b^6 of the rod B⁵. The swinging arm B⁶ has journals supported by bearings consisting of screws or pins b^8, fitted in metal rods B⁷ B⁸. The rod B⁸ is connected by a wire, B⁹, with the rod A⁴, and hence is in electrical communication with the wire A⁷, which leads to one pole of the battery. The rods B⁵ B⁸ are insulated from each other and from the rods A⁴ A⁵. A wire, B⁴, extends from the rod B⁵.

Whenever the swinging arm B⁶ is allowed to descend, so that its projections b^7 will make contact with the offset or shoulder b^6 of the rod B⁵, an electric circuit will be completed from the battery A⁸, along the wire A⁷ to the wire B⁹, thence through the wire B⁸ to the swinging arm B⁶, thence over the latter to the rod B⁵, and thence along the wire B⁴. The wires B⁴ A⁹ form part of a circuit for controlling a different part of the electric or secondary clocks from that part which is controlled by the circuit of which the wires A⁹ A¹¹ form part. For instance, the circuit of which the wires A⁹ A¹⁰ form part may control the part of the electric or secondary clocks whereby minutes and hours are recorded, and the circuit of which the wires B⁴ A⁹ form part may control a part of the electric or secondary clocks whereby days of the month will be indicated.

I will now describe the manner in which the swinging arm B⁶ is operated. B¹⁰ designates a rod supported in the frame of the primary clock or regulator. Under it is arranged a rotary shaft, B¹¹, on which is affixed a wheel, B¹², having a cam-surface, b^9, on one side. The lower end of the rod B¹⁰ is provided with an offset, b^{10}, that projects into the path of the cam-surface b^9 of the wheel B¹², and is adapted to extend under a projection, b^{11}, with which the swinging arm B⁶ is provided. The lower portion of the rod B¹⁰ is resilient. When the cam surface b^9 of the wheel B¹² comes opposite the rod B¹⁰, the latter will be sprung aside. Its offset b^{10} will then be moved from under the swinging arm B⁶, and the latter will descend, so that its projections b^7 will make contact with the offset b^6 of the rod B⁵. As soon as the cam-surface b^9 has passed by the rod B¹⁰, the latter will be ready to assume its original position and support the swinging arm B⁶ again. It cannot, however, assume its normal position until the swinging arm has been raised to its normal position. The swinging arm B⁶ will be raised to its normal position by a cam or eccentric, B¹³, on the sweep second-shaft A. As the shaft A rotates rapidly, the swinging arm B⁶ will only be left in contact with the rod B⁵ momentarily. The shaft B¹¹ is provided with a wheel, B¹⁴, which has twenty-four teeth. On the sweep second-shaft A a tubular minute-hand shaft, B¹⁵, is arranged. This minute-hand shaft makes a rotation once every hour, and is provided with a wheel, B¹⁶, having a single tooth that engages once in each rotation with the wheel B¹⁴, and moves the latter a short distance. A spring-actuated tooth, B¹⁷, which engages with the wheel B¹⁴, insures the latter being moved a distance equal to the distance between two adjacent teeth each time the wheel B¹⁶ engages with it. This spring-actuated tooth also completes each movement of the wheel B¹⁴ quickly, the tooth of the wheel B¹⁶ serving merely to start the movement. The tooth B¹⁷ also prevents the wheel B¹⁴ from moving backward. The cam-surface b^9 on the wheel B¹² is to be so short that when the tooth on the wheel B¹⁶ engages a tooth on the wheel B¹⁴, and moves the latter rotarily for the twenty-fourth time, the wheel B¹² will be rotated far enough to cause the cam-surface b^9 to swing the rod B¹⁰, and pass under and beyond the same, thus allowing the rod B¹⁰ to return quickly to its normal position.

I will not occupy time with the description of the other parts of the primary clock or regulator, as they are not involved in my invention, and may be of any desirable construction.

Obviously the primary clock or regulator must be so organized that the swinging arm A³ cannot make contact with the rod A⁵ at the same time that the swinging arm B⁶ makes contact with the rod B⁵.

I do not here lay claim to the combination of my primary clock or regulator with other parts of an electric time-indicating system in which it may be used, as I intend to file other applications for Letters Patent covering combinations of such primary clock or regulator with other parts of an electric time-indicating system.

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

1. In a primary clock or regulator, the combination of the rod A⁴, the rod A⁵, having an adjustable contact-piece, the swinging arm A³, provided with a wheel, A², said swinging arm being fulcrumed at one end, and having a contact-piece between the fulcrum and said wheel, and a shaft, A, provided with a notched wheel, A′, substantially as specified.

2. In a primary clock or regulator, the combination of the rod B⁵, swinging arm B⁶, rod B¹⁰, shaft B¹¹, wheel B¹², wheel B¹⁴, wheel B¹⁶ on the shaft B¹⁵, and cam or eccentric B¹³ on the shaft A, substantially as specified.

3. In a primary clock or regulator, the combination of rod A⁴, swinging arm A³, rod A⁵, rod B⁵, swinging arm B⁶, and mechanism for operating the swinging arms A³ B⁶.

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