

(No. Model.)

C. A. HUSSEY.
SECONDARY ELECTRIC CLOCK.

No. 350,433.

Patented Oct. 5, 1886.

Fig. 2.

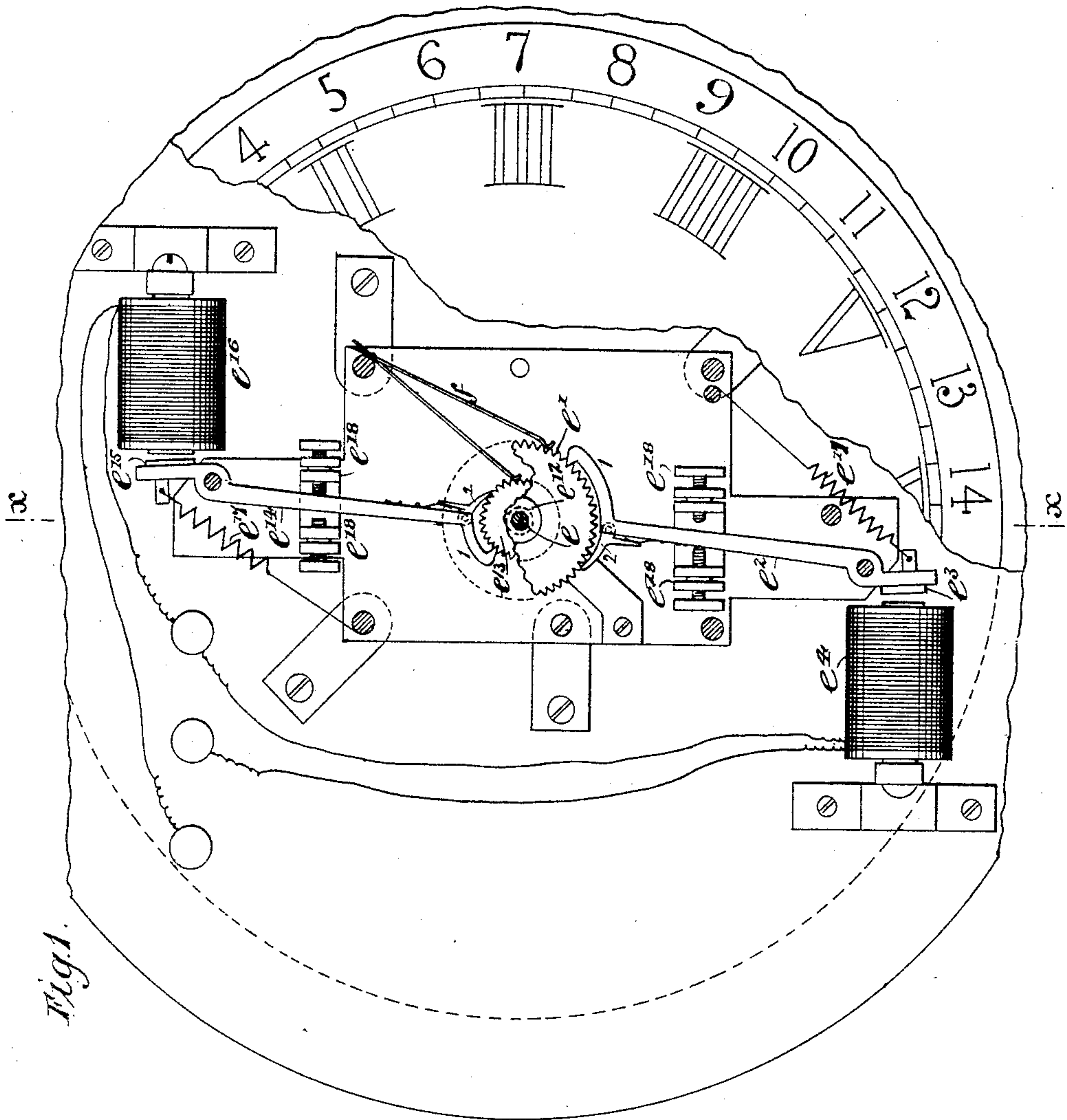
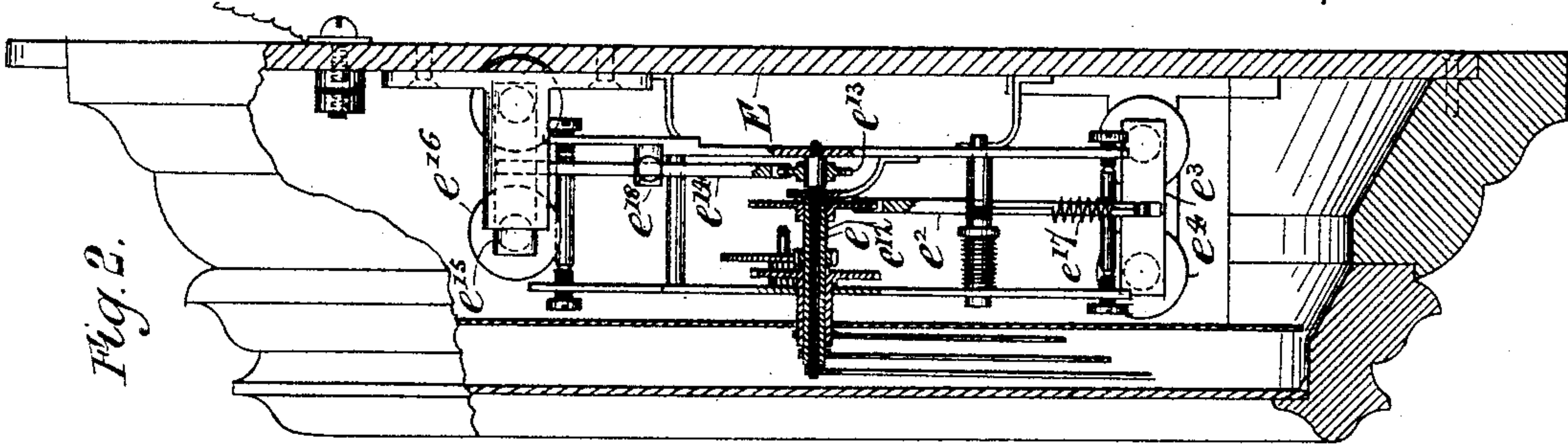


Fig. 1.

Witnesses
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UNITED STATES PATENT OFFICE,

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

SECONDARY ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 350,433, dated October 5, 1886.

Application filed June 18, 1886. Serial No. 205,849. (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
5 Improvement in Electric or Secondary Clocks, of which the following is a specification.

My improvement relates to electric or secondary clocks, such as are used in a time-telegraph and operated under control of a primary clock or regulator arranged at a distant place.
10

I will describe an electric or secondary clock embodying my improvement, and then point out the various features in claim.

15 In the accompanying drawings, Figure 1 is a front view of an electric or secondary clock embodying my improvement, part of the dial being broken away, and also a part of the framework supporting the mechanism being removed to exhibit features embodying the improvement. Fig. 2 is a transverse section of the clock, taken as indicated by the dotted line *x x*, Fig. 1.
20

Similar letters of reference designate corresponding parts in both figures.
25

A shaft, *e*, is provided with a wheel, *e'*, having sixty teeth. This wheel *e'* has combined with it a pawl-lever, *e''*, that has affixed to it an armature, *e'''*, having electro-magnets *e''''*.
30 This shaft *e* is a minute-shaft. In other words, it makes a complete rotation once every hour to indicate the minutes upon the clock-dial. It has the minute-hand of the clock affixed to it. Gearing or a train is combined with
35 this shaft to transmit motion to the hour-hand shaft which surrounds the minute-shaft.

The pawl-lever *e''* has one rigid pawl, 1, and a second pawl, 2, which is pivoted to it and pressed against the wheel *e'* by a spring.
40 When the pawl-lever *e''* is vibrated by the attractive force of the electro-magnet *e''''*, its rigid pawl 1 is disengaged from the wheel *e'*, and its pivoted pawl 2 is caused to move over the teeth of the wheel in the reverse direction to that
45 in which the wheel moves when rotated. The stop-pawl *f* prevents the wheel from moving while the pivoted pawl 2 of the pawl-lever *e''* moves in this direction. As soon as the electro-magnet de-energizes, a spring, *e'''''*, vibrates
50 the pawl-lever in the reverse direction, then the pivoted pawl 2 of the pawl-lever rotates the wheel *e'* the distance of one tooth, and the

rigid pawl 1 of the pawl-lever re-engages with the wheel *e'*, thereby preventing it from moving farther than it is proper for it to move. 55 The movement of the pawl-lever *e''* is limited by stops consisting of adjustable screws *e''''''*.

The shaft *e* and the fulcrum of the pawl-lever *e''* are journaled in the frame of the clock.

A tubular shaft, *e''''*, is fitted upon the shaft *e*, and is provided with a wheel, *e'''''*, having thirty-one teeth. Combined with this wheel *e'''''* is a pawl-lever, *e''''''*, having affixed to it the armature *e'''''''*, of an electro-magnet, *e''''''''*. The pawl-lever *e''''''* is limited in its vibratory movements by stops *e''''''''*, similar to the stops *e''''''* previously described. This pawl-lever is moved in one direction by the electro-magnet *e''''''''*, and retracted by a spring, *e'''''''''*. Like the pawl-lever *e''* it has a rigid pawl, 1, and a pivoted pawl, 70 2. The latter is held against the teeth of the wheel *e'''''* by a spring. When the pawl-lever *e''''''* is vibrated by the electro-magnet *e''''''''*, its rigid pawl 1 is disengaged from the teeth of the wheel, and the pivoted pawl 2 is caused to 75 play over the teeth of the wheel *e'''''* in the reverse direction to that in which the latter moves when rotated. As soon as the electro-magnet releases the pawl-lever *e''''''*, the spring *e'''''''''* retracts the pawl-lever, causing the pivoted 80 pawl 2 to rotate the wheel *e'''''*, and rigid pawl 1 to re-engage with the wheel *e'''''*, so as to prevent it from being moved too far. While the pivoted pawl 2 of the pawl-lever *e''''''* plays over the teeth of the wheel *e'''''* in the reverse direction to that in which the wheel moves when rotated, the stop-pawl *f* prevents the wheel from rotating. The tubular shaft *e''''* carries the hand which marks the day of the month upon the dial of the clock. 90

The electro-magnet *e''''''''* is for operating the mechanism whereby minutes and hours are indicated upon the clock-dial, and the electro-magnet *e''''''''* operates mechanism whereby days of the month will be indicated on the dial. 95

It will be readily seen that the wheels *e'* and *e'''''* are rotated in the same direction. This is advantageous, because it is desirable that the figures upon the clock-dial which indicate days of the month should be read in the same direction as those which indicate hours of the day. 100 By the arrangement indicated, the hour-hand and the calendar-hand will be caused to travel in the same direction around the dial. The

operating electro-magnets and pawls are on opposite parts of the clock-case.

The ends of the wires of the electro-magnets e^4 e^{16} are connected directly or indirectly with line-wires in such a way that they will operate at different times. The electro-magnet e^4 is intended to operate once a minute, and the electro-magnet e^{16} once a day.

I do not here claim the combination of my electric or secondary clock with other parts of an electric time-indicating system, as I intend to file other applications for Letters Patent covering it in combination with other parts of the electric time-indicating system.

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

In an electric or secondary clock, the com-

bination of a minute-shaft, an hour-shaft surrounding said minute-shaft, a train for transmitting motion to the hour-shaft from the minute-shaft, a tubular calendar-shaft surrounding the minute-shaft but otherwise independent of it, a pawl-lever and an electro-magnet for operating the minute-shaft, and another pawl-lever and electro-magnet for operating the calendar-shaft, the said shafts all being concentric, and the pawl-levers and electro-magnets being arranged on opposite sides of them, substantially as specified.

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Witnesses:

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