

(No Model.)

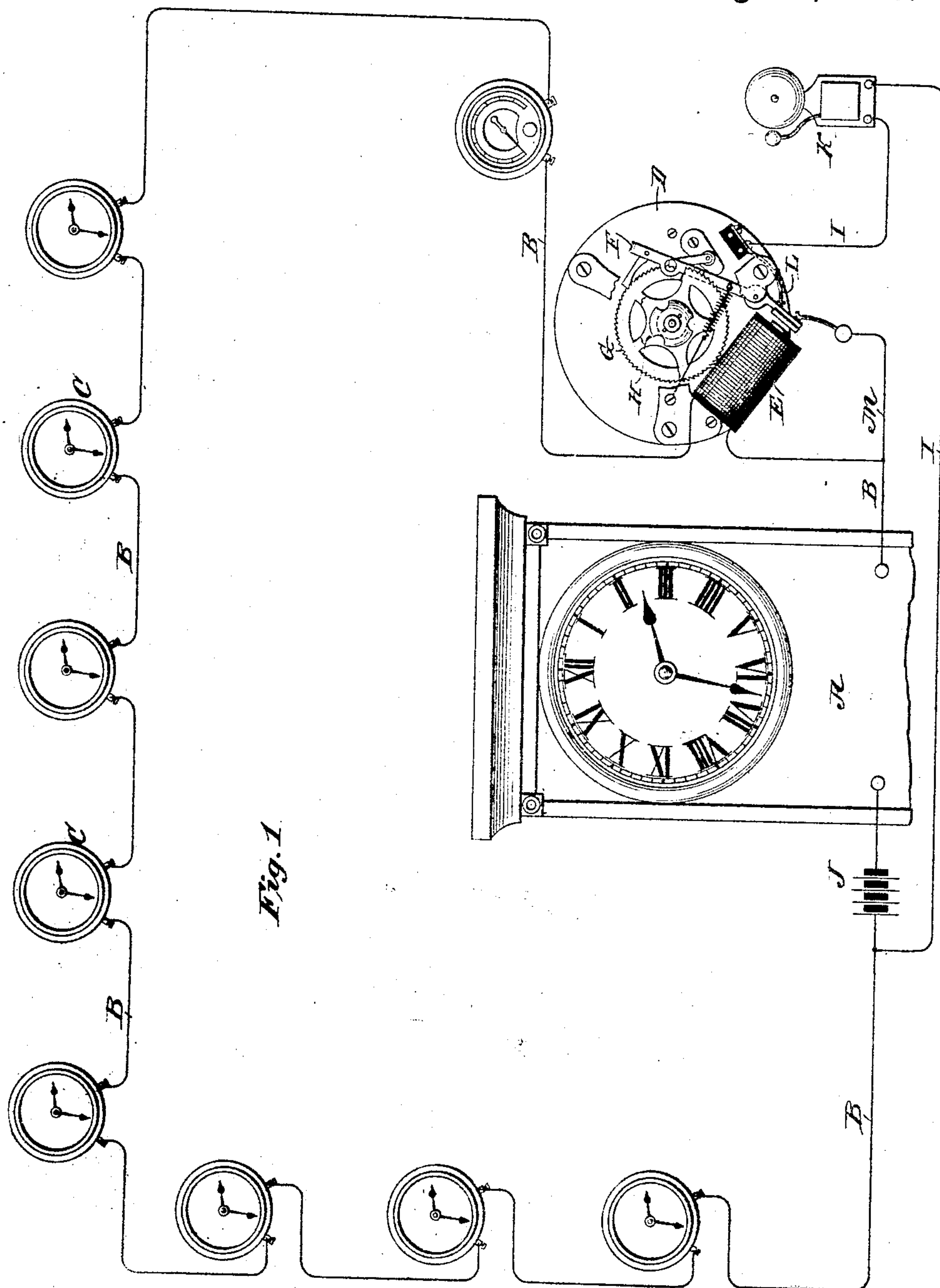
2 Sheets—Sheet 1.

C. D. WARNER & A. D. BENNETT.

ELECTRIC CLOCK SYSTEM.

No. 387,704.

Patented Aug. 14, 1888.



Witnesses,

Geo. W. Brewster.
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Inventor,

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By Their Attorney,

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(No Model.)

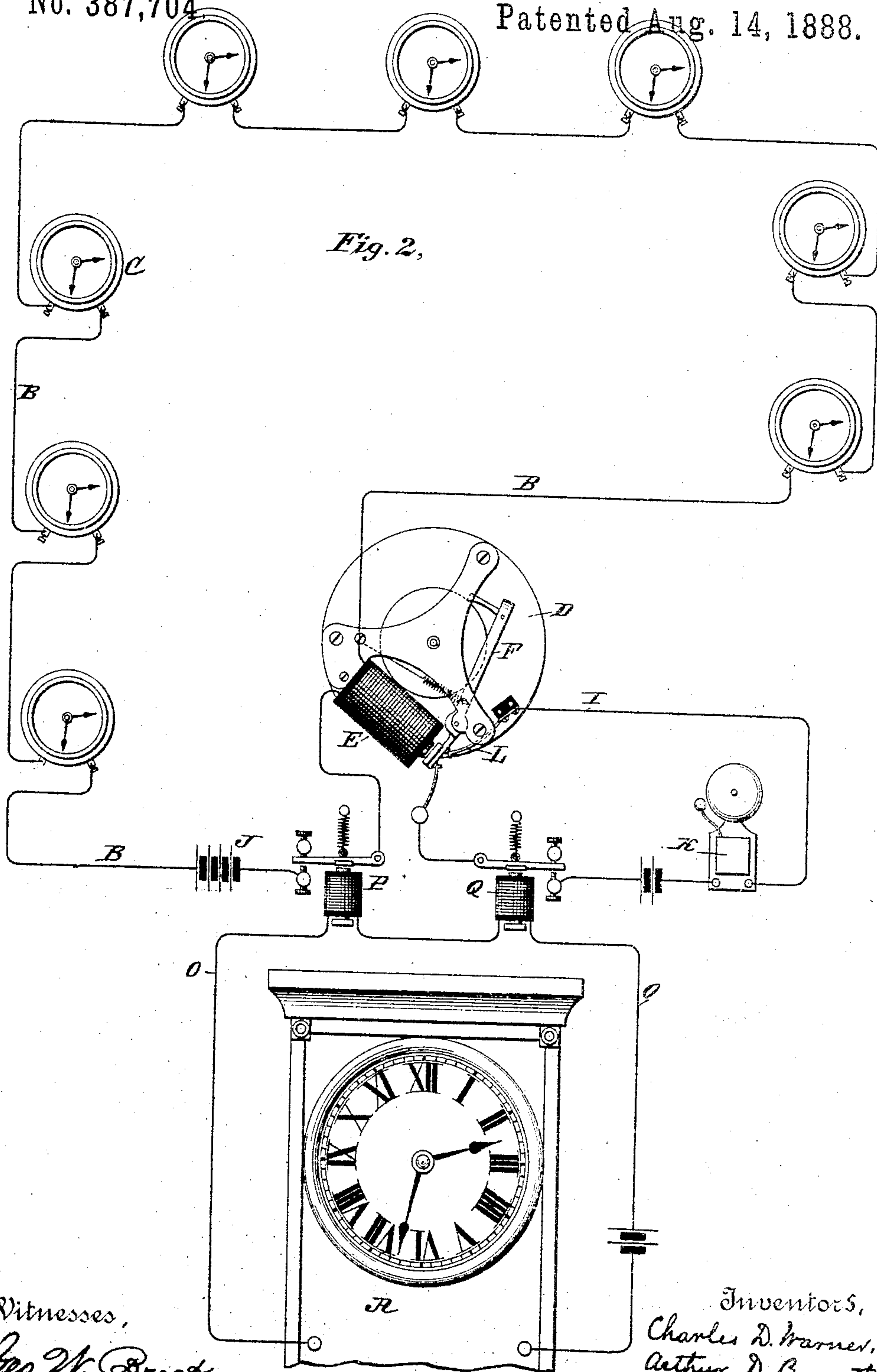
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C. D. WARNER & A. D. BENNETT.

ELECTRIC CLOCK SYSTEM.

No. 387,704

Patented Aug. 14, 1888.



Witnesses,
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UNITED STATES PATENT OFFICE

CHARLES D. WARNER, OF ANSONIA, AND ARTHUR D. BENNETT, OF NEW HAVEN, ASSIGNORS TO THE STANDARD ELECTRIC TIME COMPANY, OF NEW HAVEN, CONNECTICUT.

ELECTRIC-CLOCK SYSTEM.

SPECIFICATION forming part of Letters Patent No. 387,704, dated August 14, 1888.

Application filed May 7, 1888. Serial No. 273,035. (No model.)

To all whom it may concern:

Be it known that we, CHARLES D. WARNER, of Ansonia, in the county of New Haven and State of Connecticut, and ARTHUR D. BENNETT, of New Haven, in the county of New Haven and State of Connecticut, citizens of the United States, have invented certain new and useful Improvements in Electric-Clock Systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to those systems in which an electric clock is arranged to open and close an electric circuit containing and operating electric secondary clocks.

The object of the invention is to provide means by which any failure of the working circuit—the circuit containing the secondary clocks—shall be at once made apparent by a suitable signal. Thus, there are usually two conditions of failure that these circuits are always subject to, one being the weakening of the working-line battery so that the secondary clocks operate irregularly or not at all, and the rupturing of the working-line by which all work therein ceases. In either of these cases it is highly important that the condition of the line be at once made known, that steps may be promptly taken to remedy the trouble.

To this end our invention consists of an electric alarm connected to the working-circuit and through it to the electric clock or regulator, the circuit or operating mechanism of which alarm is rendered inoperative by the normal action of the secondary-clock line, but is closed or made operative and the alarm sounded whenever the secondary-clock line is not properly working.

Referring to the drawings, Figure 1 is a diagrammatic view of a clock system embodying our invention, Fig. 2 being a similar but modified view.

In the views, A represents the regulator, which may be of any of the well-known forms.

B is the secondary or working circuit, C being the secondary or service clocks. It is to be understood that the regulator is arranged to close the line B at regularly recurring intervals, and thereby synchronously maintain

the secondary clocks C. These secondary clocks may be of various forms of construction; but we prefer the form shown and described in the United States Letters Patent No. 363,440, issued to Charles D. Warner May 24, 1887.

D is the dial-plate of such a clock, as seen from the rear; E, the actuating-magnet; F, the armature-arm carrying a pawl and stop, whereby the propelling-wheel G and stop-wheel H are properly actuated, the common shafts of such wheels being the minute-hand arbor and having operative connection with the hour-hand sleeve.

One of the secondary clocks, as the clock D, is located at the central office or near the regulator, so as to be under constant inspection.

I is a local or shunt circuit, which extends from one side of the main battery J through the alarm-bell K to the armature contact-spring L of the clock D, and then through the armature to the main line B, as by a branch, M, and another spring, N, bearing on the armature-arm. The electro-magnet E of the secondary clock and its armature are constructed and adjusted to operate more quickly than those of the alarm K, and they are also adjusted so that their proper operation signifies the working of all the secondary clocks—that is, this clock D may be adjusted so that upon the partial failure of the main-battery current, or for other similar cause, this clock would fail to work before the other secondary clocks would fail, and so provide for the battery being attended to before the working of the main line would actually become irregular or cease.

The action of the system is as follows: So long as the working-circuit remains unbroken and the working-battery is of sufficient strength to operate these secondary clocks, the movement of the armature of the local secondary clock will take place before the coils of the alarm can be sufficiently charged to cause an alarm to be given, and the local circuit through the alarm will be broken by such armature leaving the contact spring or springs of this local circuit. Under these conditions the system will be understood to be in good order and to

need no attention. If, however, the working-line be broken, the local secondary clock will fail to operate, the local circuit will be held closed, and the alarm will sound every time the regulator acts to close the working-line, thus calling attention to the fact that the secondary clocks have stopped. A like result is obtained by the reduction of the battery-power or the accidental introduction into the working-line of a too high resistance, for then there would not be power enough exerted by the magnet of the local clock to move its armature and open the local circuit.

Thus far we have described the invention when it is applied to the working-circuit through the medium of a shunt or cross-circuit. The arrangement of the circuits may, however, be variously changed. Thus, in Fig. 2 the regulator A operates a relay-circuit, O, the relays of which, P and Q, respectively, close the working-circuit and a local circuit, I, through the alarm K, this latter local circuit being connected with the local alarm-clock D, as before. The failure of the working-circuit to properly operate the secondary clocks will, after the manner already described, cause an alarm to be sounded.

Other arrangements of circuits are possible; but those described will suffice to explain the principle of the invention.

What is claimed as new is—

1. In an electric-clock system, the combination of a secondary-clock circuit, a regulator for operating the same, and an alarm-circuit connected with said secondary circuit and rendered inoperative by the working thereof, whereby the alarm is prevented from sounding during the normal action of the secondary-clock circuit and sounded when their action becomes abnormal or ceases.

2. In an electric-clock system, the combination, with the regulator A, and the secondary-clock circuit B, the local clock D, and the alarm-circuit I K, connected with the working-circuit and the local clock, substantially as described, and for the purpose described.

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Witnesses:

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