

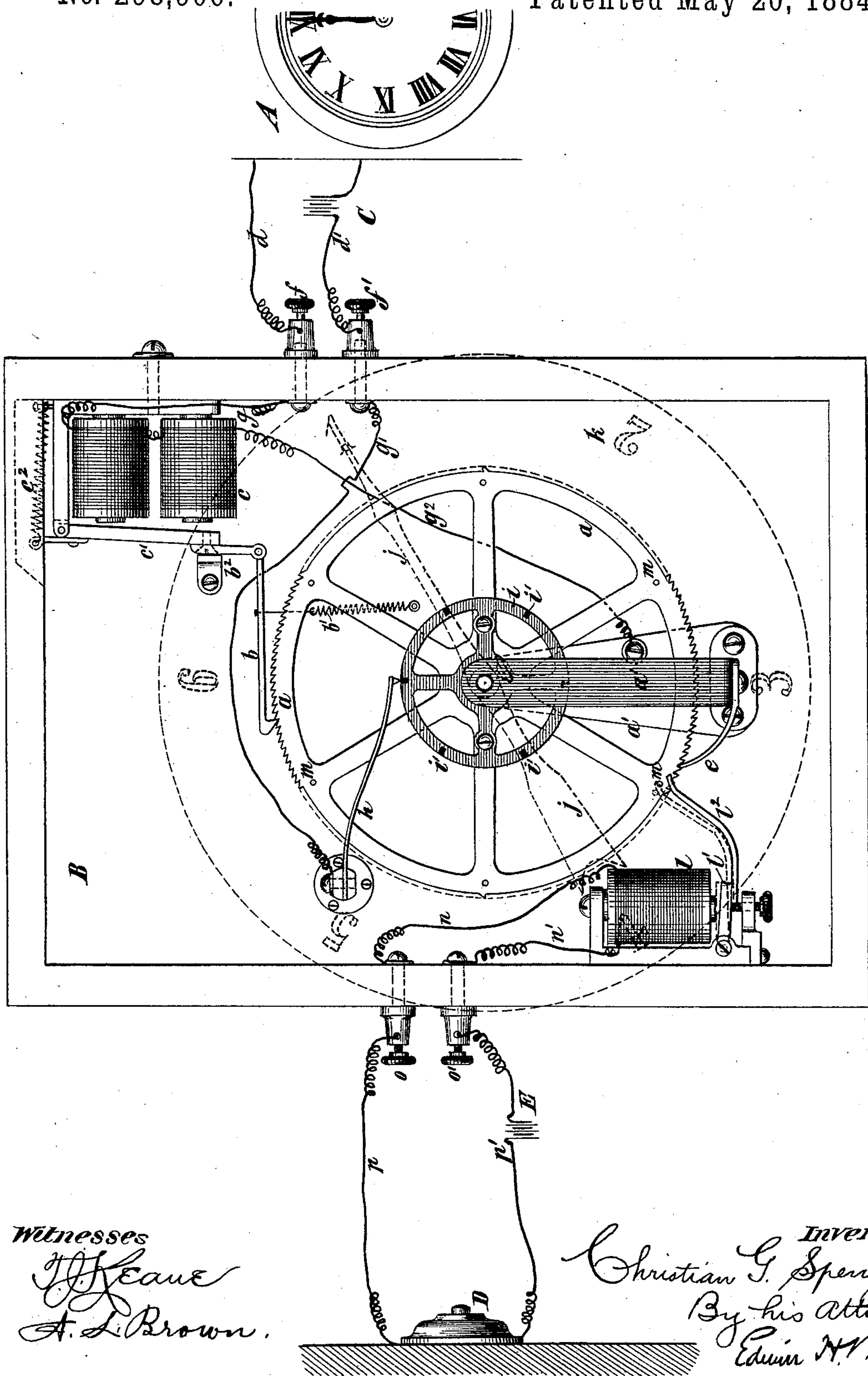
(No Model.)

C. G. SPENGLER.

WATCHMAN'S ELECTRIC TIME DETECTOR.

No. 298,906.

Patented May 20, 1884.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## WATCHMAN'S ELECTRIC TIME-DETECTOR.

SPECIFICATION forming part of Letters Patent No. 298,906, dated May 20, 1884.

Application filed September 1, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN G. SPENGLER, of Hoboken, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Watchman's Time-Detectors, of which the following is a specification.

In my improvement I use in an office a main time-piece and a number of electrical time-pieces, which are run through the agency of the main time-piece for definite periods only, and at the end of each of those periods become released from the control of the main time-piece, so as to require to be carried under control of the main time-piece for each of the subsequent periods of time by action on the part of the watchman. The watchmen act on the electrical time-pieces for this purpose by operating instruments arranged on their beats. If the watchmen arrive at these instruments behind time, the electrical time-pieces will indicate that fact at the office.

The accompanying drawing illustrates apparatus embodying my improvement.

A designates the main time-piece. It may consist of a chronometer or an ordinary clock operated by springs, weights, or other means. This is arranged in an office or station.

B designates one of a number of electrical time-pieces, which are also arranged in the office or station. As all these electrical time-pieces are alike, I have deemed it sufficient to show but one. I will describe this in detail. A large wheel, *a*, mounted on a shaft or arbor so as to be capable of rotating freely, is provided with a definite number of teeth. As shown it is designed to have one hundred and eighty teeth, and to be moved forward one tooth every second minute, so as to accomplish a complete rotation every six hours. Obviously it might, with the same result, be provided with three hundred and sixty teeth, and be moved forward one tooth every minute. Its teeth are ordinary ratchet-teeth. A pawl, *b*, is held in contact with the teeth of this wheel by means of a spring, *b'*, and is pivotally connected, or in other words hinged, to the armature *c'* of an electro-magnet, *c*. The armature, when not influenced by the electro-magnet, is drawn away therefrom by means of

a spring, *c''*, shown as acting on the armature above its hinge. When the armature is attracted by the electro-magnet, the pawl is caused to rotate the wheel *a*, and when it is released by the electro-magnet and operated by the spring *c''* it is caused to advance from one tooth into the next. It is prevented from moving farther than from one tooth to another by means of a stop, *b''*, with which the armature makes contact. Each time the electro-magnet is energized the wheel is rotated the distance of one tooth, and each time it is de-energized the pawl is advanced the distance of one tooth over the wheel. The electric circuit in which this electro-magnet is included comprises wires *d d'*, that extend to the main time-piece A. The main time-piece is provided with a circuit closer and breaker, which closes and breaks the circuit once in every two minutes. I have not thought it necessary to show this circuit-breaker, as it may be made in various ways. The wires *d d'* of a number of the electrical time-pieces B may be connected to wires common to all, and extending from them to the circuit closer and breaker of the clock. The electric circuit of the electrical time-piece shown may be supplied with electricity by means of a battery, C, or other generator of electricity. The wheel *a* of the electrical time-piece has combined with it a stop-pawl, *e*, shown as made of resilient material, such as spring metal, so that it will allow the teeth of the wheel to pass it as the wheel rotates, and yet will engage with them as soon as they pass it. The wires *d d'* of the electric circuit, in which the electro-magnet *c* is included, are secured in binding-screws *f f'*, arranged on the case of the electrical time-piece. From the binding-screw *f'* a wire, *g'*, extends to a metal bracket supporting a metal contact-piece, *h*. A wire, *g*, extends from the binding-screw *f* to one end of the wire of the electro-magnet *c*, and a wire, *g''*, extends from the other end of the wire of the said electro-magnet to one of the standards, in which the shaft or arbor of the wheel *a* is supported. This standard and the shaft or arbor of the wheel *a* are to be made of metal. The wheel itself and the other standard may be of metal or other suitable material. The electric circuit



is thus extended from the wire  $g^2$  to the shaft or arbor of the wheel  $a$ . On this shaft or arbor is mounted a wheel,  $i$ , which is made of metal, and provided in its periphery with pieces of insulating material,  $i'$ . Both the wheel  $a$  and this wheel  $i$  are rigidly secured on their shaft or arbor. These pieces of insulating material are arranged at six equidistant points on the periphery of the wheel  $i$ , and the contact-piece  $h$  makes contact with the periphery of the wheel at a point immediately above the axis of the wheel. Each time one of these pieces of insulating material makes contact with the contact-piece  $h$  the electric circuit, which includes the electro-magnet  $c$ , is broken, so that even if the main time-piece closes the circuit the electro-magnet will still remain unenergized.

As the wheel  $a$  is designed to make a rotation in six hours, and the pieces of insulating material are arranged at points distant from one another one-sixth of the periphery of the wheel  $i$ , it is obvious that the electric circuit will be thus broken and taken out of the influence of the main time-piece by the contact of a piece of insulating material with the contact-piece  $h$  at the end of every hour during which the electrical time-piece runs. The ends of the beat of the patrolman or watchman whose movements are desired to be indicated are so far distant that he consumes in passing from one to another such period as elapses between the contact of one piece of insulating material  $i'$  with the contact-piece  $h$ , and the contact of the succeeding piece of insulating material  $i'$  with the contact-piece  $h$ —in this instance one hour.

On the shaft or arbor of the wheels  $a$   $i$  is affixed an index-finger,  $j$ , (shown in dotted outline,) which operates in conjunction with a dial,  $k$ , (also shown in dotted outline,) to indicate time. The wheels have to be rotated, so as to break the contact of each piece of insulating material with the contact-piece  $h$ , by an act of the patrolman or watchman. His failure to do so at the proper time will be indicated by the position of the index-finger on the dial of the electrical time-piece, for if that finger indicates a different time from that indicated by the main time-piece it shows that he has not arrived at the end of his beat at the proper time.

I will now describe the means whereby he operates the wheels. In the case of the electrical time-piece is an electro-magnet,  $l$ , provided with an armature,  $l'$ , which is hinged in place and furnished with a push-piece,  $l''$ . This push-piece operates upon a number of pins,  $m$ , extending outwardly from the front of the wheel  $a$ . When not attracted by the electro-magnet, the armature descends by gravity, and then the push-piece is out of the path of the pins  $m$ . When the wheels  $a$   $i$  stop with one of the pieces of insulating material in contact with the contact-piece  $h$ , one of the pins  $m$  will be opposite the push-piece  $l''$ . As soon as

the armature is attracted by the electro-magnet, the push-piece will be forced against the adjacent pin  $m$ , and will impel the wheels forward far enough to bring into engagement with the pawl  $b$  the next tooth in advance of the one with which it was engaged. The piece of insulating material on the wheel  $i$ , which was previously in contact with the contact-piece  $h$ , is thus carried beyond this contact-piece, and the electrical time-piece is again brought under control of the main time-piece  $A$ . The ends of the wire of the electro-magnet  $l$  are connected by wires  $n$   $n'$  to binding-screws  $o$   $o'$  on the case of the electrical time-piece, and thence wires  $p$   $p'$  extend to a switch in an instrument,  $D$ . The wires  $p$   $p'$  are normally disconnected. When the patrolman or watchman operates the switch, he connects them so as to complete the electric circuit of the electro-magnet  $l$ , and causes the electro-magnet to actuate the push-piece  $l''$ . Preferably, the switch-instrument  $D$  will be arranged in a case whose cover can only be unlocked by the patrolman or watchman, so as to afford access to the switch. There will be one of three switch-instruments for each electrical time-piece, and there may be one electrical time-piece for each end of the beat of the patrolman or watchman; but if additional recording-dials be used to check a patrolman from operating the electrical time-piece continually from one and the same end of a beat, but one electrical time-piece need be used for each beat. As these check-dials form no part of my present invention I do not deem it necessary to here illustrate them.

When an apparatus embodying my improvement is to be used by a watchman, and will be looked at only in the morning after the end of the time the watchman is on duty, it may be well to place a plug in the path of the finger  $j$ , so that the plug, by the position which the finger occupies relatively to it, will indicate whether or not the finger has been operated.

The electric circuit, including the electro-magnet  $l$ , may be supplied with an electric current from a battery,  $E$ , or other generator.

This combination of a main time-piece with a number of electrical time-pieces makes a very simple and effective recording mechanism.

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

1. The combination of an electrical time-piece, a main time-piece controlling the operation of the electrical time-piece, means for breaking at desired periods the electric circuit which extends between the electrical time-piece and the main time-piece, and mechanism adapted to be operated from a distant point for the purpose of re-establishing the electric circuit which extends between the electrical time-piece and the main time-piece, substantially as specified.

2. The combination of an electrical time-piece, a main time-piece controlling the op-



eration of the electrical time-piece, the contact-piece *h* and wheel *i*, provided with pieces of insulating material, *i'*, for breaking the electric circuit which extends between the electrical time-piece and the main time-piece, and mechanism adapted to be operated from a distant point for the purpose of shifting the wheel *i* to remove one of its pieces of insulating material beyond the reach of the contact-piece *h*, substantially as specified.

3. The combination of an electrical time-piece, a main time-piece controlling the operation of the electrical time-piece, means for

breaking at desired periods the electric circuit which extends between the electrical time-piece and the main time-piece, and electromagnetic mechanism adapted to be operated from a distant point for the purpose of re-establishing the electric circuit which extends from the electrical time-piece to the main time-piece, substantially as specified.

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