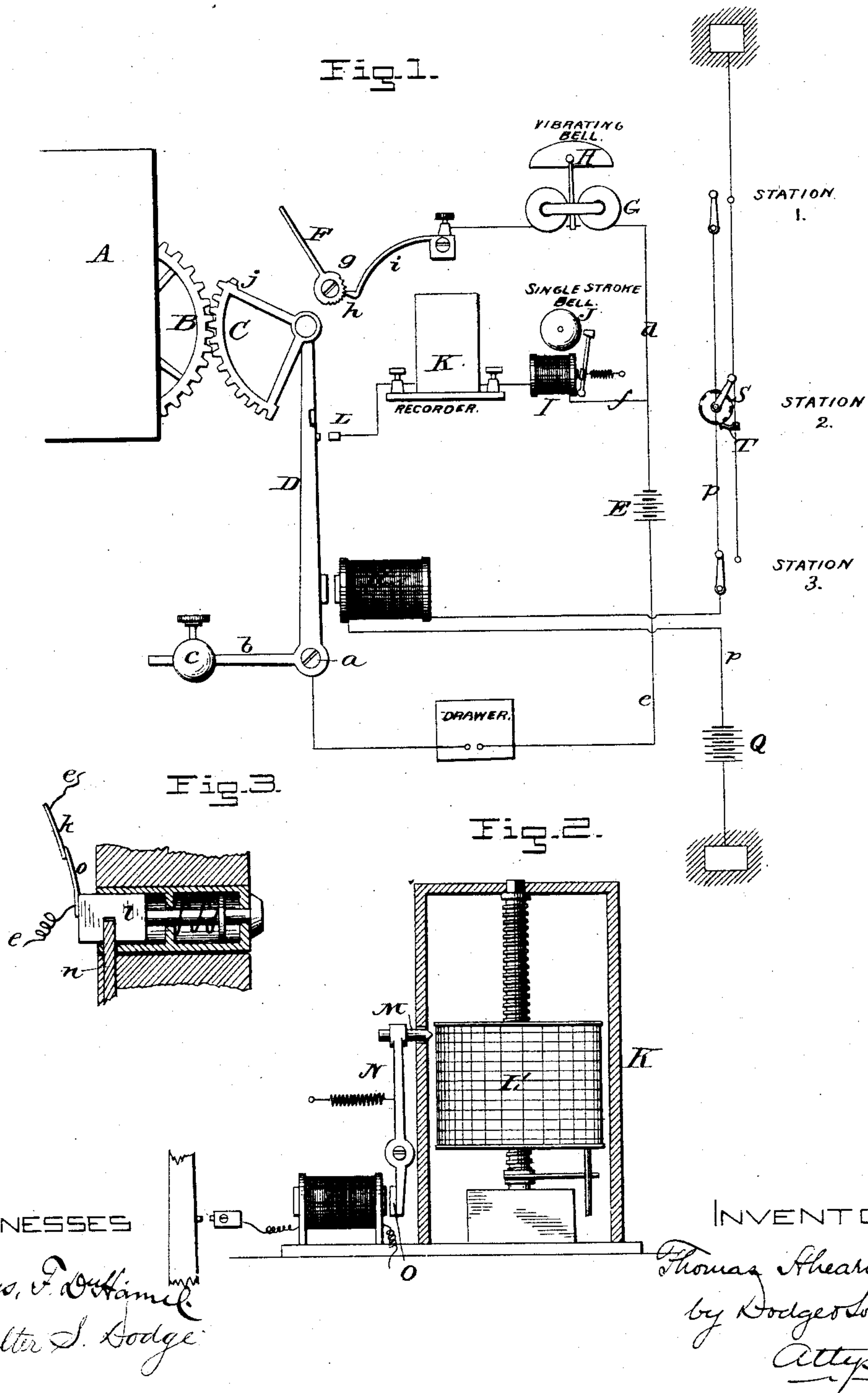


(No Model.)

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ELECTRIC TIME DETECTOR.

No. 287,401.

Patented Oct. 30, 1883.



# UNITED STATES PATENT OFFICE.

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## ELECTRIC TIME-DETECTOR.

SPECIFICATION forming part of Letters Patent No. 287,401, dated October 30, 1883.

Application filed July 3, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS AHEARN, of Ottawa, in the county of Carlton and Dominion of Canada, have invented certain Improvements in Watchmen's Time-Detectors, of which the following is a specification.

My invention relates to that class of watchmen's time-detectors or tell-tales which are operated by means or with the aid of electricity; and it consists in a novel construction and arrangement of parts, hereinafter fully set forth, the purpose being not only to simplify and cheapen the construction, but also to prevent interference with the operation, and to secure a perfect check upon the watchman.

In the accompanying drawings, Figure 1 is a plan view or diagram representing the apparatus as applied to use; Figs. 2 and 3, views illustrating details.

The apparatus consists of a local battery and circuit, a vibrating bell in said circuit, a clock or time movement, a gravitating toothed segment pivoted to the armature of an electro-magnet, meshing with a wheel of said time-movement, and arranged to close the local circuit when brought by the time-movement to a certain position, a main battery, and a conductor provided with an electro-magnet and with a series of grounding devices or circuit-closers, whereby the main circuit may be completed and the electro-magnet energized to attract its armature and withdraw the segment from mesh with the wheel of the time-movement, permitting the segment to fall, and preventing the completion of the local circuit and consequent ringing of the vibrating bell or sounding of other alarm than merely striking a small single-stroke bell to call attention to the fact that the watchman is attending to this duty.

Referring again to the drawings, A represents a clock or time movement of any suitable pattern, and B a slowly-traveling wheel of the clock-train, the speed or travel of which is calculated with reference to other parts of the mechanism.

C indicates a gravitating segment, toothed, to mesh with the wheel B, and pivoted to one end of a swinging armature, D, the opposite

end of which turns upon a pivot or pin, *a*, and is furnished with a laterally-extending arm or stem, *b*, upon which is placed an adjustable counterpoise, *c*, for the purpose of maintaining the armature normally in a vertical position. So long as the armature remains in this position the segment C continues in mesh with the wheel B; but if the armature be swung outward from the clock or time mechanism the teeth of the segment will be withdrawn from those of the wheel, and if the segment be at the moment above its lowermost position it will drop to said position, as will be readily understood by referring to the drawings. The rate of travel of wheel B, and the distance through which segment C is made to travel, are such that a stated length of time, ordinarily ranging from five to thirty minutes, will elapse from the time the segment begins its upward travel to the moment when it will touch the contact-piece F, if not caused to fall back. The segment C in falling strikes against the upright armature D, or against a stop thereon, so that when dropped to its lowermost position the upper tooth will be just about on a line passing through the pivotal center of the segment and the center of wheel B; hence the moment the armature falls away from the electro-magnet the segment will be put into mesh with said wheel.

E represents a local battery, and F a contact piece or arm connected with one pole of said battery by a conductor, *d*, the other pole being connected with the segment C through a conductor, *e*, and armature D, as indicated. The electro-magnet G of a vibrating alarm-bell, H, is introduced into the line *d* of the local battery at a point between the contact piece or arm F and the battery E, as indicated in Fig. 1, and at a point between the electro-magnet G and the battery E a branch wire, *f*, is carried to and coiled about a core, to form an electro-magnet, I, for actuating a single-stroke bell, J, the wire *f* being thence continued to a registering device, K, and finally to a metallic stop-block, L, against which armature D strikes or bears when thrown outward, to cause the disengagement of the segment from the wheel B.

The contact piece or arm F is pivoted at one



end and formed with a hub, *g*, which is provided with flat faces, or, as shown in Fig. 1, with notches, into which a tooth, *h*, of a spring, *i*, engages to hold the piece *F* at any desired angle or adjustment. These notches are so spaced that a change from one to the next increases or diminishes the distance between the end of the piece *F* and the contact-point *j* of segment *C* to an extent equivalent to a given period of time in the travel of segment *C*—say five minutes—so that the apparatus may be set to sound the alarm at the end of five minutes, or any multiple thereof, up to the limit of adjustment. This is important, because it enables the device to be used in various connections and under changing conditions.

The vibrating bell and the single-stroke bell are of ordinary construction, which is so well understood as to require no explanation here; and the same is true of the recording device, which may, however, consist of a graduated cylinder, *L'*, moved at a definite speed by time mechanism, and a needle, pencil, or marking device, *M*, carried by a lever, *N*, to which an armature, *O*, is applied, so that when the electro-magnet *P* of the register *K* is energized by the passage of a current through branch wire *f* the armature will be attracted and the pencil or marker brought against the face of the cylinder and caused to register each contact of the armature *D* and stop-block *L*. As stated, however, any common form of registering device may be used. From the foregoing it will be seen that if the segment *C* be allowed to remain in mesh with wheel *B*, and the time mechanism be allowed to continue running, the segment will, at the end of a stated period, come into contact with the piece *F*, and the local battery-circuit will thus be completed through line *e*, armature *D*, segment *C*, contact piece or arm *F*, and conductor *d*, which latter includes the coil of electro-magnet *G* of bell *H*; hence said bell will be caused to ring whenever the contact between segment *C* and arm *F* is established. This contact can only occur through the negligence of the watchman, whose duty it is to withdraw the armature *D* and permit the segment to fall before the contact is made, hence the sounding of the alarm shows that the watchman is not at his post, or is not attending properly to his duty.

The contact between segment *C* and arm *F* takes place only when the armature is in its normal position or out of contact with stop-block *L*; hence when the alarm is sounded no record is made by the recorder *K*, and the single-stroke bell is not sounded, because the circuit is not completed through line *f*. When, however, the armature is properly retracted to disengage the segment, it makes contact with stop-block *L*, and a local circuit is established through line *e*, armature *D*, block *L*, recorder *K*, electro-magnet *I* of single-stroke bell *J*, line *f*, and wire *d*, causing the recorder

to record the establishment of such circuit, and also causing the single-stroke bell to sound and call the attention of the clerk or other person to the fact that the watchman has performed his duty.

The wire *e* of the local-battery circuit is carried into a drawer of an office-desk or other convenient place capable of being locked, and is separated, one end being attached to a plate, *k*, and the other to a spring-jack, *l*, arranged to move over the mortise into which the lock-bolt *n* of the drawer-lock passes when the drawer is locked. The jack stands normally in position to prevent the bolt from being shot or thrown outward, but is notched and adapted to be moved so as to bring the notch over the lock-bolt, as indicated, a button being applied to the spring-jack, to permit it to be moved from the outside when the drawer is closed. When the jack is thus pressed in, to permit the locking of the drawer, the arm *o* of jack *l* is brought into contact with the plate *k*, and the line at this point is thus completed; but when the drawer is unlocked the spring-jack moves outward, and, carrying the arm *o* away from plate *k*, breaks the circuit and prevents the sounding of signals; hence by leaving the drawer unlocked the device may be left out of action, as in the case of the watchman being off of duty, or for other reason; but when the drawer is locked the connection cannot be interrupted by unauthorized persons. The manipulation of the spring-jack in locking the drawer at night will also serve as a reminder to wind the clock or time-piece.

The manner of controlling the segment *C* will be readily understood upon referring to Fig. 1, in which *Q* represents a main battery, one pole of which is connected by a line or conductor, *p*, to one end of the coil or helix of an electro-magnet, *R*, the other end of which is connected with a continuation of the line *p*, running to the different floors, rooms, or points to be guarded. At each of these points is placed a pull, button, wheel, or other suitable device, each connected with the line *p* and each adapted to be grounded or connected with earth by a movement of the pull, button, or other device, such grounding serving to complete the main-line circuit, and consequently energizing electro-magnet *R*, which at once attracts armature *D* and causes it to swing away from wheel *B*, taking the segment *C* out of mesh therewith and permitting said segment to fall, as before explained. As soon as the ground-connection is destroyed the electro-magnet *R* again becomes inert and the weight *c* returns the armature *D* to its vertical position, again placing the segment in mesh with wheel *B* of the time mechanism preparatory to a repetition of the action already explained.

A simple switch or button may be used at each point, or a signal wheel, slide, or like device may be used, in order to indicate the point or station at which the watchman may be at the time of operating the device. These



appliances are well known and require no description, consisting merely of a wheel or body, S, in electrical connection with the line, and formed with alternate metallic bearing-faces, and insulated or recessed portions acting in connection with a spring-finger, T, in electrical connection with the ground.

The number and arrangement of bearing faces or points represent numerals, and cause the armature D to be attracted and released, the recording-marker to be brought into and released from working position, and the single-stroke bell to give a definite and predetermined signal when the wheel or other device is moved, as is well understood.

It will be found advisable to substitute a spring for the weight *c* when a signal wheel or slide is used, as it is necessary for the armature to make and break connection with the binding-screw L rapidly, to cause the bell to give the required number and order of strokes, each contact and completion of the circuit causing one stroke.

It is obvious that the details may be considerably modified, the armature D, for instance, being suspended, instead of being supported, from below, a closed, instead of an open, circuit being used for line *p*, &c.

It will be seen that with the above construction the watchman is obliged to operate one of the pulls, buttons, or like devices within the stated time, and cannot, by hurrying from one point to another through the entire series, set them so that he may gain a delay equal to the aggregate of the periods which should occur between the operation of the devices at the different points.

Having thus described my invention, what I claim is—

1. In a time-detector, the combination of a time-movement, a gravitating segment meshing with a wheel thereof, and arranged to complete an electric-alarm circuit when moved a given distance by the wheel, an armature connected with the segment, an electro-magnet in a second electric circuit, and a device adapted and arranged to complete said second circuit, substantially as and for the purpose set forth.

2. In combination with a time-movement and a circuit-closer moved thereby, an armature connected with the circuit-closer, an electro-magnet in a main electric circuit, a single-stroke electric bell in a local circuit arranged to be closed by the armature, and one or more signal-wheels, each arranged to close and open the main electric circuit and to attract and release the armature, substantially as set forth, whereby the circuit-closer of the local line is caused to fall away from its closing position and a signal is sounded on the bell to show from what point the operation is effected.

3. In a time-detector, substantially such as described, the combination, with a wheel of the time-movement, of a circuit-closer consisting of a toothed rack in electrical connection with one pole of a battery and a contact-

plate in the path of travel of said rack connected with the opposite pole of the battery.

4. In a time-detector, a circuit-closer consisting of a toothed rack meshing with a wheel of a time-movement, a contact-point in the path of movement of said rack, an armature connected with the rack, an electro-magnet in an open main circuit, and a circuit-closer also in said main circuit, all combined and operating substantially as set forth, whereby the closing of the main circuit is caused to attract the armature and to withdraw the rack from mesh with the wheel of the time-movement.

5. In combination with a time-movement, and with a toothed rack operated thereby, and arranged to close an electric circuit, means, substantially such as described and shown, for withdrawing the rack from the wheel and preventing the completion of the circuit.

6. In a time-detector, substantially such as described and shown, the combination of a time-movement, a gravitating segmental circuit-closer arranged to be moved by a wheel of the time-movement and to close a local alarm-circuit within a given period of time, an armature connected with the segment, an electro-magnet in an open main circuit arranged to attract the armature, and a circuit-closer in the main circuit, whereby the segment can be withdrawn from the time-movement, as desired.

7. In combination with a local alarm-circuit and with wheel B of a time-movement, a segmental gravitating circuit-closer meshing with said wheel, a pivoted armature carrying said circuit-closer, and provided with a counterpoise, *c*, an electro-magnet in a main circuit arranged to attract the armature, and a circuit-closer in the main circuit adapted to close the circuit and cause the magnet to attract the armature.

8. In a time-detector, substantially such as described and shown, the combination of a time-movement, an armature, a toothed segment pivoted to the armature arranged to mesh with a wheel of the time-movement and to close a local electric circuit containing a bell or alarm, an electro-magnet in an open main circuit arranged to attract the armature aforesaid, and a movable device arranged to complete the main circuit, substantially as and for the purpose set forth.

9. The herein-described watchman's time-check, consisting of time-movement A, provided with wheel B, segment C, pivoted to the swinging armature D, local battery E, conductors *d e*, and a bell included in the circuit of said local battery, contact-piece F, main battery Q, electro-magnet P, and one or more circuit-closers, all substantially as shown and described.

10. The herein-described watchman's time-check, consisting of time-movement A, provided with wheel B, segment C, pivoted to moving armature D, local battery E, conductors *d e*, vibrating bell H, branch wire *f*, sin-



gle-stroke bell J, recorder K, and stop-block L, all combined and arranged to operate substantially as described and shown.

5 11. In a watchman's time-detector, substantially such as described and shown, the combination, with the separated ends of the local-battery line, of a spring-jack arranged to extend within a drawer or like place to break

and perfect said line, and to extend across the path of the lock-bolt of the drawer when the circuit is broken, substantially as and for the purpose explained.

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Witnesses:

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W. Y. SOPER.