C. H. POND & A. TENNEY.

Automatic Fire-Alarm Boxes.

No. 212,818. Patented Mar. 4, 1879.

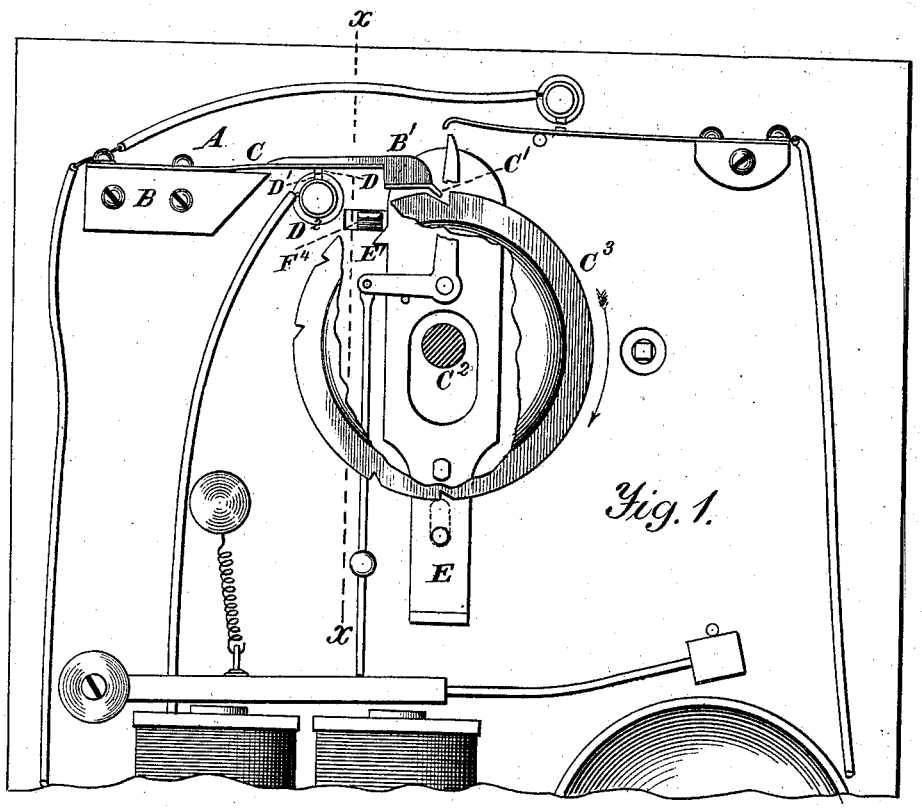


Fig. 1.

Fig. 2.

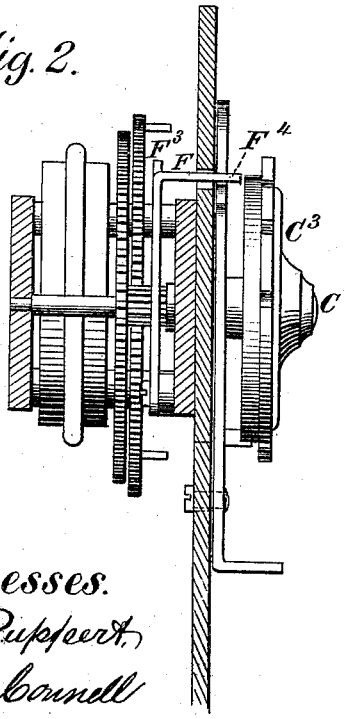


Fig. 3.

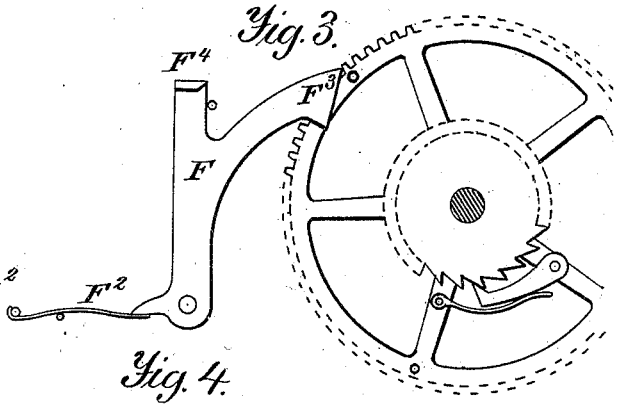
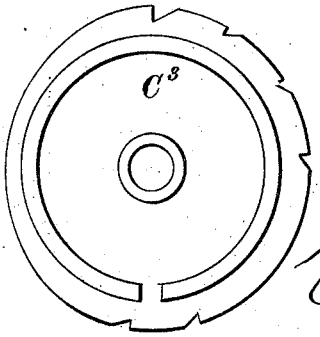


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHESTER H. POND AND ALVAN TENNEY, OF NEW YORK, N. Y.

IMPROVEMENT IN AUTOMATIC FIRE-ALARM BOXES.

Specification forming part of Letters Patent No. **212,818**, dated March 4, 1879; application filed January 4, 1879.

To all whom it may concern:

Be it known that we, CHESTER H. POND and ALVAN TENNEY, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Automatic Fire-Alarm Boxes; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification—

Figure 1 being an elevation of a portion of the mechanism of a fire-alarm box, showing a cam or wheel for operating a key or circuit-breaker, an armature, conducting-wires, portions of a magnet, and of a bell for giving an alarm. Fig. 2 is a sectional elevation, on line *x x* of Fig. 1, of a portion of the clock-work mechanism which drives the cam or wheel, a portion of the plate to which it is secured, the cam or wheel, and a pivoted arm, which supports a sliding bar in its elevated position and releases it at desired intervals, and allows it to drop down and arrest the motion of the cam or wheel, said cam being moved into the requisite position for that purpose by a pin or pins arranged in one of the wheels of the train. Fig. 3 is a front view of the arm which liberates the sliding bar, a spring which holds it in position, and of the pin-carrying wheel of the train; and Fig. 4 is a detached view of the wheel, showing how it may be made of cam shape.

Corresponding letters denote like parts in all of the figures.

This invention relates to that type of fire-alarm boxes technically called "non-interfering," and its object is to give greater efficiency to that class of instruments.

The general features of the operating mechanism of this box will be found described in the specification of an application by Chester H. Pond filed in the United States Patent Office on the 2d day of November, 1878, to which reference is made, and hence a detailed description here is not necessary.

In this specification reference is only made to the novel features embraced in this invention, and to so much of the other mechanism as is necessary to show their connection therewith.

The first part of this invention relates to an improved method of breaking and closing an electric circuit automatically, and the second part to a device for controlling the number of revolutions that it may be desired to give the cam or wheel which operates the circuit-breaking key of a signal-box.

In order to secure non-interference between the different boxes connected in a system effectively, it is necessary that the box first commencing an alarm should control the circuit by practically holding it open during the entire time such signal is being given. Of course, it is necessary to restore or close the circuit at intervals in order to make the signal; but the greater relative time the circuit is held open, as compared with the time it is closed, the more efficient is the principle of non-interference, as the mechanism is such that if another box is started while the first one has the circuit open the second will give no alarm, and hence it will not cause any interference.

The circuit-wheel which has heretofore been used is one upon the several teeth of which the electric circuit has been closed; but that plan is defective, and often results in failure, owing to the fact that some of the teeth become oxidized or covered with dust or other foreign substances, they being constantly exposed to such accumulation.

Another objection is that a sliding connection, or a connection made by causing one surface to move in contact with another, is undesirable, because in such cases the contact is maintained for a considerable period of time, which operates to decrease the efficiency of the instrument as a non-interfering one, for the reason that it is possible for an operator at another box to get possession of the line before the first box has completed its signal.

The method of closing an electric circuit by solid platinum points, such as are used in a Morse key, is acknowledged to be the best known, and hence one part of our invention relates to and is designed to provide practical means for applying this principle to fire-alarm boxes, in doing which we provide a circuit-breaking key, A, (shown in Fig. 1,) which consists of a block of rubber, B, which is secured

to the plate of the instrument, and has attached to and extending from it a spring, C, to the outer end of which there is secured another rubber block, B′, and to the same a steel foot or point, C^1.

The spring C has projecting from it a platinum point, D, which, when the mechanism of the box is at rest, comes in contact with another similar point, D^1, placed in an insulated stud, D^2, secured in the plate of the instrument.

For operating the key A, there is placed upon the shaft C^2 of the driving mechanism a wheel, C^3, which may be of the form shown in Fig. 4, or it may be concentric to its axis, as shown in Fig. 1. This wheel is made to revolve under the point C^1 of the key A by means of some suitable driving mechanism, such as a train of wheels driven by a spring or a weight, or in any other manner.

When the parts of the mechanism are in their normal positions, as shown in Fig. 1, the point C^1 is within one of the notches of the cam or wheel C^3, it being supported in its position by the points D and D^1.

When the cam or wheel is put in motion by the driving mechanism, by raising the slide E, (shown in Fig. 1,) so as to carry the stud E^2 out of the slot in a flange formed on said wheel, the point C^1 will instantly be raised by the sharp angles of the notches in the periphery of said wheel, and the circuit will be broken at the points D D^1, and will be kept open by the projecting parts of the cam or wheel until another notch or depression comes under the point C^1, when spring C will force points D D^1 firmly together, thereby closing the circuit, the notches or depressions in the cam or wheel being so formed that they permit the points to remain in contact for an instant only, the number and arrangement of the notches or depressions being such as to control the character of the signal to be given.

Although the circuit is closed at intervals, the closings are so nearly instantaneous that, practically, no other signal-box can be started while the circuit is thus closed, and if started between the closings no interference is caused.

Our method of closing and breaking the circuit differs from the usual one, in which the circuit is closed upon moving teeth, as in this case a contact of long duration is unnecessary, as, however short the contact may be, the magnets will be sufficiently charged.

Another advantage growing out of our method of constructing the parts is that no dust can gather upon the connecting points nor any corrosion take place there, as they are constantly in contact when the mechanism is at rest. This method also prevents the current-conductors from entering the general mechanism of the box, and confines it to properly-insulated wires, as will be seen by referring to Fig. 1 of the drawings.

The second part of this invention relates to a practical means of controlling the number of revolutions that it is desired to give the cam or key-operating wheel in any signaling mechanism. For this purpose we provide an oscillating arm, F, substantially of the form shown in Figs. 2 and 3 of the drawings. This arm is pivoted to some fixed part of the instrument, and is held in its proper position to be operated upon by a spring, F^2. It is also provided with projecting arms F^3 and F^4, the last named of which projects through the plate to which the mechanism is attached, it being placed in such a position that a projection, E^1, formed on the sliding bar E may rest upon it when the alarm mechanism is in motion, but so that it may be removed from under the same when desired, or when the alarm has been completed. The arrangement of this arm with reference to the sliding bar E is such that when said bar is raised up for the purpose of releasing the alarm mechanism, and thus sending an alarm, the arm is carried into the position shown in Fig. 3, in order that the beveled end of its projecting arm F^3 may be in a position to be operated upon by a pin or pins placed in one of the wheels of the train, as shown in Fig. 3, the movements of which will carry said arm outward, and thus remove projection F^4 from under the point on sliding bar E, which will allow it to drop of its own weight, and thus carry the projecting pin E^2 upon its outer surface into a recess formed in a flange upon wheel or cam C^3, which will have the effect to arrest the movements thereof, and so to stop the alarm.

It is obvious that the number of revolutions the cam or wheel C^3 will make depends upon the length of time that the sliding bar E is held in its raised position, and that this will depend upon the distance the pins in the wheel of the train are apart, they being arranged in this respect to suit the requirements of the constructer.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an automatic fire-alarm box, the circuit-breaking key A, consisting of a spring, C, of some conducting substance, a non-conducting portion, B′, and an attached metal point for resting upon the periphery of the cam or wheel which operates it, when used in combination with such wheel or cam, the parts being arranged with reference to each other substantially as shown, whereby when the circuit-breaking parts are in contact the contact of the wheel or cam with the key is broken, and so retained, for the purpose specified.

2. The double-armed tilting lever F, constructed and arranged substantially as shown and described, whereby the arm F^3 is brought in contact with a pin or pins in one of the wheels of the train, while the arm F^4 is made to serve as a rest for the projection E^1, formed upon the sliding bar E, from the support of which it is removed when it is desired to have bar E fall to arrest the movements of the train of wheels.

3. The combination of the tilting lever F and a sliding bar, E, having upon it a projection or projections, E^1, whereby the bar E is held in its elevated position when the train of wheels is in motion, and is allowed to fall when it is necessary to arrest such motion, all as described.

4. In a signal-box, the combination of the circuit-breaking key C, operating wheel or cam C^3, tilting lever F, and a sliding bar, E, having upon it a projection, E^1, the parts being constructed and arranged to operate substantially as and for the purpose specified.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

CHESTER H. POND.
ALVAN TENNEY.

Witnesses:
DAVID THORNTON,
AUGUSTUS MERRITT.