(No Model.)

M. MARTIN.

AUTOMATIC FIRE TELEGRAPH.

No. 360,968. Patented Apr. 12, 1887.

Fig: 1.

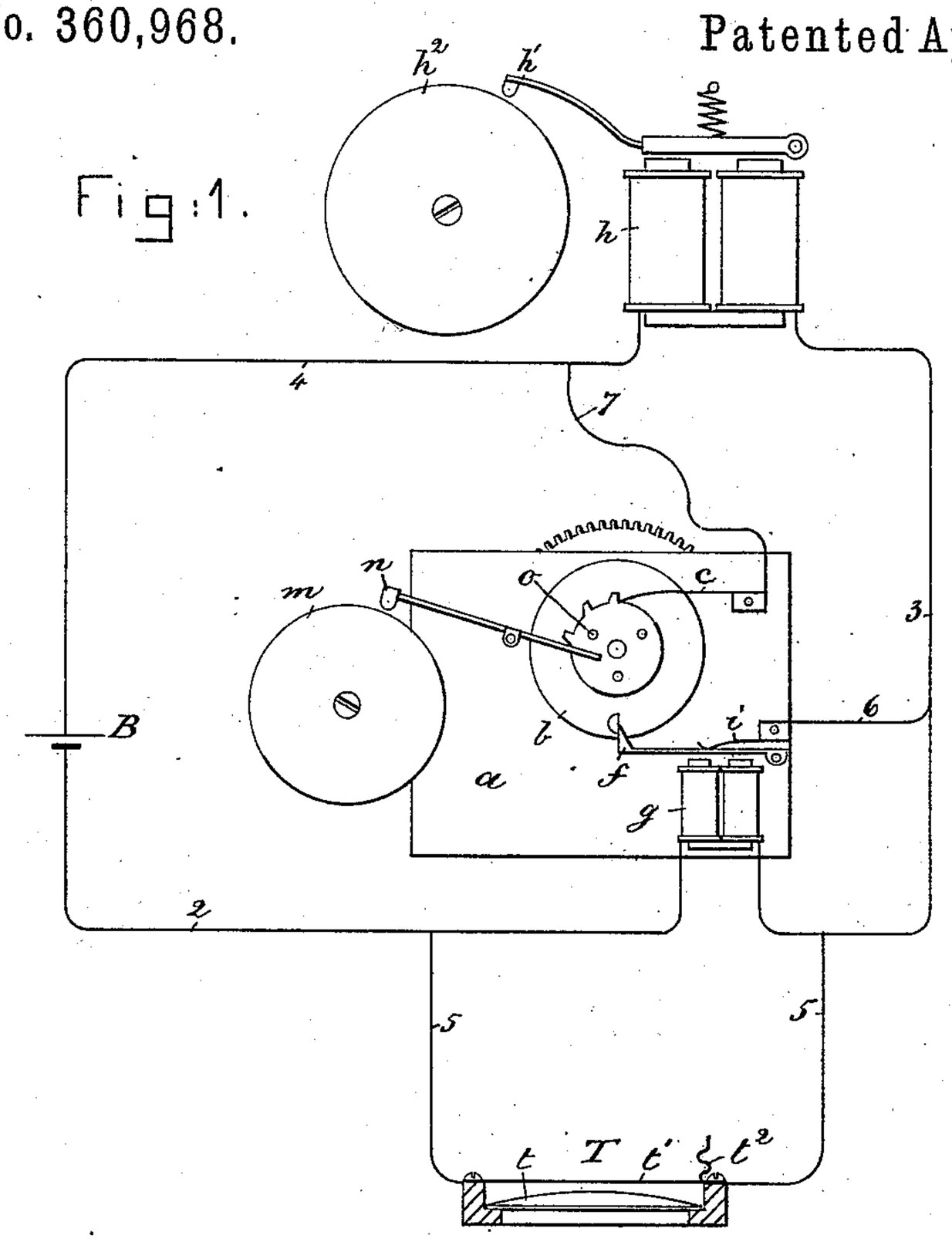


Fig: 2.

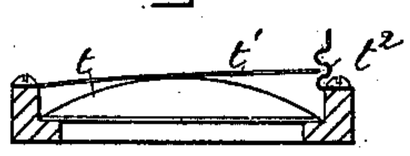


Fig: 3.

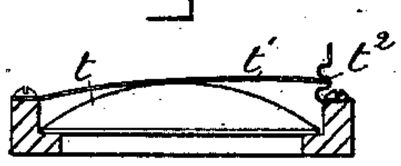
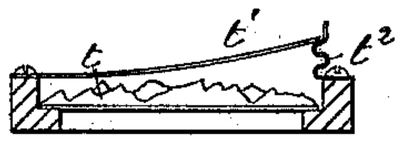


Fig: 4.



Witnesses.

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AUTOMATIC FIRE-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 360,968, dated April 12, 1887.

Application filed April 28, 1884. Serial No. 129,529. (No model.)

To all whom it may concern:

Be it known that I, MORRIS MARTIN, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Automatic Fire-Alarms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to an automatic fire-alarm apparatus of the class in which a signal-transmitting apparatus is set in operation automatically by a circuit-controlling device operated by a change in temperature, in order to transmit a signal to a distant point, indicating that a fire has broken out.

The object of the present invention is to prevent the transmission of a false signal in case of a change in the circuit produced otherwise than by the operation of the circuit-changer that is operated by a rise in temperature. As shown in this instance, the transmitter is controlled by an electro-magnet included in a normally-closed circuit and shunted by a branch circuit of low resistance containing a thermostatic circuit-breaker, that is operated by a rise in temperature to break the said shunt and thereby cause the current to traverse the starting or releasing magnet of the transmitter, causing the latter to produce a signal in the usual manner.

The circuit-breaker is constructed to break and then close the circuit, thus affecting the magnet momentarily, and the transmission of the signal is also controlled by the said shunt in such manner that when the said shunt is in its normal condition or closed the signal will be transmitted; but when the said shunt is broken, as would be the case if one of the wires or connections should be severed otherwise than by the automatic circuit-changer, the said signal will not be transmitted. The transmitting-circuit is shown in this instance as controlled by the magnet which releases the transmitting apparatus. Thus, when the shunt is broken and immediately closed or its condition momentarily changed by the operation of the transmitter, the circuit controlled by the transmitter will be closed and operative for sending a signal; but when the said shunt is broken without being subsequently closed, or, in other words, when its condition is permanently changed, the said transmitter will be released, but it will not operate to transmit a signal to the distant point, although it will preferably operate an independent local alarm, showing that an accident has occurred to the circuit-wire.

Figure 1 shows, mainly in diagram, an apparatus embodying this invention; and Figs. 2, 3, and 4, details of the thermostatic or circuit-controlling instrument.

This transmitting apparatus is shown as a clock-work or motor, *a*, for rotating a break-wheel, *b*, co-operating with a contact-spring, *c*, to transmit a signal in the well-known manner, the movement of the said clock-work and break-wheel being controlled by a detent, *f*, operated by an electro-magnet, *g*, which may be called the "starting" or "controlling" magnet. The said magnet is shown in this instance as included in a normally-closed circuit, 2 3 4, of the battery B, and is shunted by a branch, 5, of low resistance, including a circuit-changer, T, of any suitable character, shown in this instance as comprising a reservoir, *t*, having a flexible side and containing a volatile fluid, which, by its expansion produced by a rise in temperature, will expand the flexible side of the said reservoir, causing it to engage the contact-spring *t'* and raise it from connection with the contact-piece t^2, the said spring and contact-piece forming a part of the shunt-circuit 5 of the magnet *g*, which is thus broken when the spring *t'* is thus raised, as shown in Fig. 2. The breaking of the circuit 5 causes the whole current of the battery to pass through the magnet *g*, causing it to attract its armature, and thus release the transmitter *a*.

The contact-piece t^2 is so constructed that the spring *t'* immediately after being raised therefrom will be engaged by an overhanging portion of the said contact-piece t^2, as shown in Fig. 3, again closing the circuit, the said contact-piece holding the spring in its raised position, as shown in Fig. 4. The shunt-circuit 5 is thus closed again immediately after being opened, thus causing the magnet to release its armature immediately after it has been moved to release the clock-work *a* of the transmitter.

The instrument controlled by the transmitter is herein shown as a gong or audible sig-

nal having an actuating-magnet, *h*, included in the main circuit 2 3 4, and having a shunt or branch circuit, 6 7, including the spring *c*, break-wheel *b*, and a circuit-closer, *i*, depending on the condition of the shunt-circuit 5, it being shown in this instance as controlled by the armature of the said magnet *g* being closed when said armature is unattracted. Thus, when the magnet *g* is momentarily energized by the breaking immediately followed by the closing of the shunt 5, the branch wire 6 will be connected by the spring *i* with the armature of the magnet *g* and the clock-work *a*, including the break-wheel *b*, so that when the projecting portions of the said wheel come in contact with the spring *c* the shunt for the magnet *h* will be completed and the said magnet demagnetized, permitting its armature to be retracted, and when the tooth or projection of the wheel passes from beneath the spring the shunt is broken and the magnet energized, causing the bell-hammer to strike a blow on the bell, so that the passage of each tooth of the break-wheel causes a blow on the signal-gong h^2. If, however, the shunt 5 of the magnet *g* were permanently broken, as by the rupture of one of the wires 5, the said magnet would retain its armature attracted, and the shunt 6 7 of the magnet *h* would remain open at *i*, so that the break-wheel can produce no change in the condition of the magnet *h*, or, in other words, can transmit no signal.

When the shunt 5 is permanently broken, it is desirable to operate a local alarm to call attention to the fact. As shown in this instance, the clock-work *a*, when released, actuates a local alarm consisting of a bell, *m*, the hammer *n* of which is operated by pins *o*, projecting from the break-wheel *b*. Thus, when the shunt 5 is permanently broken or deranged or operated otherwise than by the circuit-changer T, no fire-alarm signal will be produced, but the local alarm will be operated, calling attention to the derangement of the circuit.

The invention is not limited to the precise construction and arrangement of the parts herein shown, as it is obvious that these may be varied widely, one feature of the invention being that the circuit-controlling instrument or thermostat produces a momentary change in the circuit instead of a permanent change, as has always been the case in apparatus of this kind heretofore used, and that the signaling apparatus is so constructed as to be rendered operative by such momentary change, but inoperative to produce a fire-alarm signal when the change is permanent. It is not essential that the circuit-controlling instrument should be automatic or thermostatic in operation, as the spring *t'* might be moved by hand, or a hand-switch or other instrument employed controlling a transmitting-instrument and operating in similar manner to distinguish between an intentional signal or message and an accidental derangement of the circuit. The circuit-controlling instrument might be in a normally-open circuit, and momentarily close the same and immediately after restore it to its normal open condition, in which case the magnet g^2 and transmitter might be constructed just as shown; but the circuit-controlling instrument and magnet *g* would be in an independent circuit from that of the magnet *h*, and the said magnet *h* might be included in the circuit of the break-wheel and operated by opening and closing the same in the usual manner, instead of being shunted by the said wheel.

These are but a few of the modifications of arrangement that may be made, and numerous others might be readily suggested, all of which would be within the scope of the invention.

Another feature of the invention is that the thermostat controls both the operation of the transmitter and the circuit over which the latter transmits; but the precise manner in which such control is effected is not essential.

I claim—

1. An electric circuit and circuit-controlling instrument therein provided with circuit-connecting devices which in their normal operation produce a momentary change in the said circuit controlled by it, and thereafter restore the said circuit to its original or normal condition, combined with a signal-transmitting instrument controlled in its operation by the said circuit and rendered operative to transmit a signal only by a momentary change in the said circuit, substantially as and for the purpose described.

2. A signal-transmitting instrument and transmitting-circuit in which it operates, combined with a circuit-changing instrument adapted to produce a momentary change in the circuit controlled by it, which instrument governs the operation of the said transmitting-instrument and a circuit-controlling device in the transmitting-circuit governed by the said circuit-changing instrument, as set forth, the said transmitting-circuit being made operative to transmit a signal only by a momentary change in the circuit governed by the said circuit-changing instrument, substantially as and for the purpose described.

3. A transmitting-instrument for producing a definite signal and a local alarm, combined with a circuit-changing instrument which produces a momentary change in the circuit controlled by it and a circuit controlled by the said circuit-changing instrument controlling the said transmitter and local alarm, as described, the former being made operative only by a momentary change in its controlling-circuit and the latter by a permanent change therein, substantially as described.

4. A thermostatic circuit-changing device which, when operated by rise in temperature, automatically changes the condition of an electric circuit and immediately thereafter restores the said circuit to its normal condition, combined with a signal-operating apparatus controlled by the said circuit, made operative by a momentary change in the circuit, but re-

tained inoperative when the circuit is permanently changed from its normal condition, substantially as and for the purpose described.

5. A signal-transmitting instrument and transmitting-circuit in which it operates, combined with a thermostatic circuit-changing device which, when operated by a rise in temperature, automatically changes the condition of an electric circuit and immediately thereafter restores the said circuit to its normal condition, and a circuit-controlling device in said transmitting-circuit governed by the said thermostatic instrument, as set forth, the said transmitting-circuit being inoperative when the said circuit-controlling device is affected by a permanent change in the circuit that controls it, substantially as described.

6. A transmitting-instrument and transmitting-circuit therefor, combined with an electro-magnet and its armature governing the operation of said transmitting-instrument and a circuit-controlling device governing the transmitting-circuit and operated by the said armature, combined with a circuit for the said magnet and circuit-changing instrument therein adapted to produce a momentary change in the circuit of the said magnet, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MORRIS MARTIN.

Witnesses:
JOS. P. LIVERMORE,
W. H. SIGSTON.