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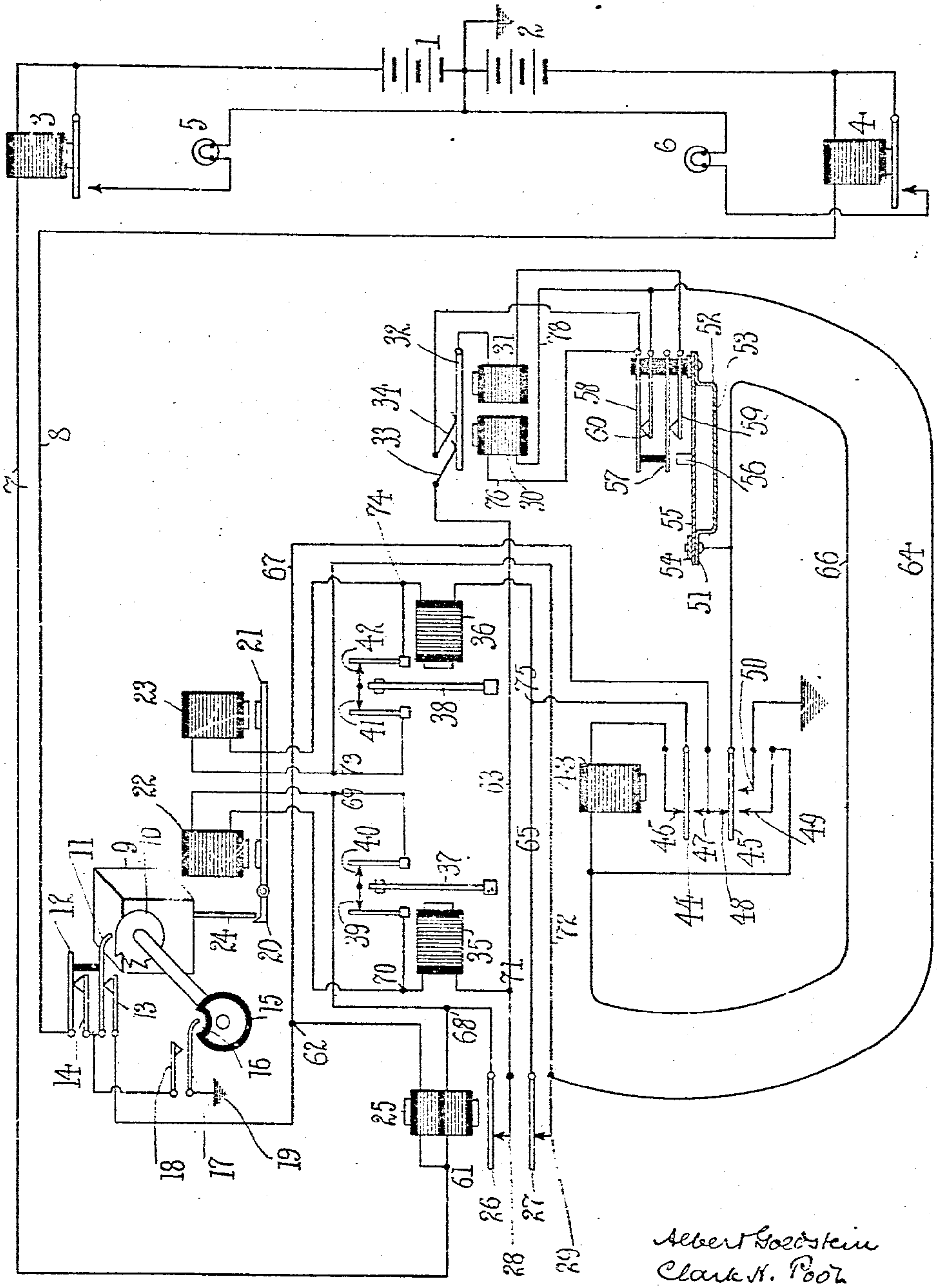
CENTRAL ENERGY ELECTRICAL TEMPERATURE ALARM SYSTEM.

APPLICATION FILED JUNE 3, 1910.

977,296. Patented Nov. 29, 1910.



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UNITED STATES PATENT OFFICE.

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CENTRAL-ENERGY ELECTRICAL TEMPERATURE-ALARM SYSTEM.

977,296. Specification of Letters Patent. Patented Nov. 29, 1910.
Application filed June 3, 1910. Serial No. 564,745.

To all whom it may concern:

Be it known that we, Albert Goldstein and Clark H. Pool, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Central-Energy Electrical Temperature-Alarm Systems, of which the following is a specification.

The invention relates to a central energy electrical temperature alarm system, and consists in the construction whereby the sending of false alarms by accidental disturbances in electrical conditions on the circuit is rendered impossible.

The accompanying drawing is an electrical diagram, in which the system is symbolically represented.

1 is the source of current, located at the central station and here shown as a divided battery, grounded at 2. The magnets 3 and 4, which control the glow lamps 5, 6, form the translating devices for the signals transmitted. The line conductors 7, 8 communicate with the distant station at which the remainder of the apparatus is located. The transmitter 9 has the usual wound clock-work or other motor mechanism to rotate, when released, the code wheel 10 which operates its switches 11, 12 to make and break circuit at contacts 13, 14. On the shaft of wheel 10 is a cam 15, having a rim of insulating material provided with a notch 16 into which enters the bent end of a switch 17. When the cam 15 rotates, switch 17 is caused to close contact with point 18, and so to establish circuit from switch 11 and contact 14 to ground 19. Wheel 10 is prevented from operating by means of a detent 20 carried by the pivoted armature 21 of two magnets 22, 23, and engaging the pallet tail 24 of the clock-work driving mechanism of said wheel. When one or the other or both of said magnets are energized, said detent releases said pallet tail.

25 is a neutral wound magnet, controlling switches 26, 27 to make and break circuit at 28, 29. The two magnets 30, 31 operate the vibrating armature 32 to make and break circuit at the springs 33, 34. The magnets 35, 36 respectively operate the weighted vibrating spring armatures 37 and 38. Armature 37 in vibrating open circuits alternately at contacts 39, 40, and armature 38 in vibrating opens circuit alternately at contacts 41, 42. Magnet 43 controls switches 44, 45 to make and break circuit at contacts 46, 47, 48, 49, 50. It should be given sufficient lag not to be influenced by the signals.

The sending of the alarm signals is controlled by a thermostat 51, in which 52 is a cup of thin metal, having a vent 53 and a rim flange, upon which flange is secured, by means of a clamping ring 54 and screws, a diaphragm 55, also of thin metal. Centrally placed on the diaphragm is a metal stud 56, through which in the manner hereafter described, said diaphragm first closes circuit and then operates spring switches 57, 58 to break circuit at contacts 59, 60.

The metallic circuit proceeds as follows: from battery 1, to magnet 3, line wire 7, to junction point 61, where the circuit divides—one branch proceeding through one coil of neutral magnet 25, to junction point 62, and the other branch proceeding through the other coil of magnet 25, to junction 68, switch 26, contact 28, junction 71, wire 63, spring 33, vibrating armature 32, spring 34, spring switch 58, contact 60, wire 64, contact 29, switch 27, wire 65, junction 75, switch 44, contact 46, magnet 43, wire 66, switch 45, contact 48, wire 67, to junction 62. The two branches having joined at junction 62, the circuit continues to contact 13, switch 11, contact 14, switch 12, line wire 8, magnet 4, to battery 1.

The operation of the system is as follows: Upon a rise in temperature of the atmosphere surrounding thermostat 51, in excess of a given rate—as, for example, three degress Cent. in one minute—the diaphragm 55 moves its stud 56 into contact with spring switch 57. As any further movement of the diaphragm is resisted by the combined resiliency of the spring switches 57, 58, it remains stationary for a certain period, until sufficient pressure accumulates to cause it to move said springs away from the contact points 59, 60. During this momentary rest period of diaphragm 55, magnet 43 is short-circuited by the shunt which proceeds from armature 32, to magnet 31, contact 59, spring switch 57, stud 56, diaphragm 55 and wire 66. The consequent removal of the resistance of magnet 43 from the circuit, unbalances magnet 25, which opens circuit at 28 and 29, and thus brings magnets 35 and 36 into the circuit. The branch which includes magnet 35 proceeds from junction point 68, to junction point 69, through contacts 40, 39, to junction point 70, magnet 35 and junction point 71. The branch which includes magnet 36 proceeds from contact 29, by wire 72, junction point 73, contacts 41 and 42, junction point 74, magnet 36, to junction point 75.

During the momentary rest period aforesaid and by reason of the foregoing circuits, the armature 32, now controlled by magnet 31, is set in rapid vibration, thus imposing a frequency upon the currents energizing magnets 35, 36. Magnets 35 and 36 then vibrate their weighted spring armatures 37, 38, which, by reason of their inertia, attain sufficient amplitude of swing alternately to open circuit at contacts 40, 41 and contacts 39, 42. As magnets 22 and 23 are short-circuited through contacts 39, 40 and 41, 42, the opening of these contacts results in the energizing of magnets 22, 23, consequent attraction of armature 21, and release of the motor mechanism of wheel 10; which thereupon, in the usual way, sends a code signal to line, which signal is translated by flashes of the lamps 5, 6, at the central station.

Particular attention is here directed to the fact that it is only through the frequency current that the magnets 35, 36 are caused to vibrate their weighted spring armatures 37, 38 with an amplitude sufficient to effect the opening of the circuit at the contacts 39, 40 and 41, 42. A continuous current merely causing an attraction of the armatures will not produce the same result, since the contacts 39, 42 are so placed as that the armatures cannot reach them other than by the inertia due to their rapid vibration. Hence a ground on either of the two wires 64, 66, which may extend throughout the premises to be protected, or a crossing between said wires, will not result in an alarm being sent in, because in event of such ground or crossing, while the magnet 25 is unbalanced and magnets 35 and 36 are brought into the circuit as before, the current which magnets 35 and 36 receive is not interrupted, but comes direct from battery, and hence their armatures are merely attracted and, as already described, not moved by their inertia a sufficient further distance to break circuit at the contacts 39, 42. In the case of a break on wires 64 or 66, the frequency current affects but one of the magnets 35 or 36, depending upon the relative location of the thermostat and the point at which the break occurs. In the case of a crossing of wires 66 and 64, or a ground on wire 64, magnet 31 no longer receives sufficient current to energize it, and hence no alarm would be sent in. To meet this difficulty in case it should happen, the further movement of diaphragm 55, which takes place as the air pressure in cup 52 accumulates, is utilized. By reason of said further movement, the stud 56 raises spring switches 57, 58 to break circuit at points 59 and 60. The opening of circuit at point 59 cuts out magnet 31. The opening of circuit at point 60 brings magnet 30 in series between wires 63 and 64 the circuit then established proceeding as follows: From wire 63, to spring 33, armature 32, spring 34, wire 76, magnet 30, wire 78, to wire 64. Magnet 30 then produces the frequency current as magnet 31 did before, but now instead of said current (in the case of a ground or crossing) affecting both magnets 35 and 36, only one of these magnets is energized, depending upon the relative location of the thermostat and the point at which the ground or crossing occurs.

The following facts will now be apparent. (a) That the transmitter mechanism is released and the alarm signals sent to the central station, only when the frequency current determined by the vibration of armature 32 is competent to cause a vibration of weighted spring armatures 37 and 38 of sufficient amplitude to open the contacts at 39, 40, 41, 42. Hence no other current will affect magnets 35, 36 to accomplish this result. As grounds, breaks or crossings on the circuit cannot produce said frequency current, they cannot be sources of false alarms. (b) In event of a ground or crossing on the circuit, which might render the means for producing the frequency current inoperative, the continued movement of the diaphragm of the thermostat results in the substitution of another means not so influenced; so that no matter whether the line, at the time of the abnormal rise in temperature which it is desired shall produce an alarm, is clear or impaired by ground or crossing, the signal will nevertheless be sent in. (c) The apparatus at the protected station is energized solely by current from the central station, thus doing away with all local current sources.

We claim:

1. An electrical alarm system comprising a line circuit connecting distant stations, and, at one station, a translating device, and, at a distant station, a transmitter, means operable only by a certain frequency current for controlling said transmitter to actuate said translating device, and means for producing said frequency current.

2. An electrical alarm system comprising a line circuit, a translating device, a transmitter, motor mechanism for said transmitter, a releasing device for said mechanism controlled only by a certain frequency current, and means for producing said current.

3. An electrical alarm system comprising a line circuit connecting distant stations, and, at one station, a translating device and a source of current, and, at a distant station, a transmitter, means operable only by a certain frequency current for controlling said

transmitter to operate said translating device, and means for imposing a frequency on the current from said source.

4. An electrical alarm system comprising a line circuit, a source of current, a transmitter, a translating device, an independently operated means interposed in said circuit for imposing a certain frequency on said current, and means actuated only by said frequency current for controlling said transmitter.

5. An electrical temperature alarm system comprising a line circuit, a transmitter, a translating device, means operable only by a certain frequency current for controlling said transmitter, and means controlled only by temperature variations for producing said frequency current.

6. An electrical temperature alarm system comprising a metallic circuit, a normally grounded source of current, a ground connection from said circuit, a transmitter in said ground connection, a translating device, means actuated by a frequency current for controlling the operation of said transmitter, and an air thermostat having a vibrating member interposed in said circuit and imposing frequency on said current.

7. An electrical alarm system comprising a line circuit, a source of current, a transmitter and motor mechanism therefor, a translating device, means controlled by temperature variations to produce a frequency on said current, a magnet energized by said frequency current, a vibrating switch controlled by said magnet, and a releasing device for said motor mechanism controlled by said switch.

8. An electrical alarm system comprising a line circuit, a source of current, a transmitter, a translating device, means for controlling said transmitter operable only by a current of different character from that on said line circuit, and two devices for producing said current difference, one of said devices operating under normal conditions, and the other of said devices operating only upon the failure of said first device due to abnormal conditions on the circuit.

9. An electrical alarm system comprising a line circuit, a source of current, a transmitter, a translating device, two devices for controlling said transmitter operable only by a current of different character from that on said line circuit, and two devices for producing said current difference, one of said current difference producing devices operating under normal conditions both of said controlling devices, and the other of said current difference producing devices operating one or the other of said controlling devices only upon the failure of said first-named current difference producing device due to abnormal conditions on the circuit.

10. An electrical alarm system comprising a line circuit, a source of current, a transmitter, a translating device, two devices for controlling said transmitter operable only by a current of different character from that on said line circuit, and two devices for producing said current difference, one of said current difference producing devices operating under normal conditions both of said controlling devices, and under certain abnormal conditions one or the other of said controlling devices.

In testimony whereof we have affixed our signatures in presence of two witnesses.

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