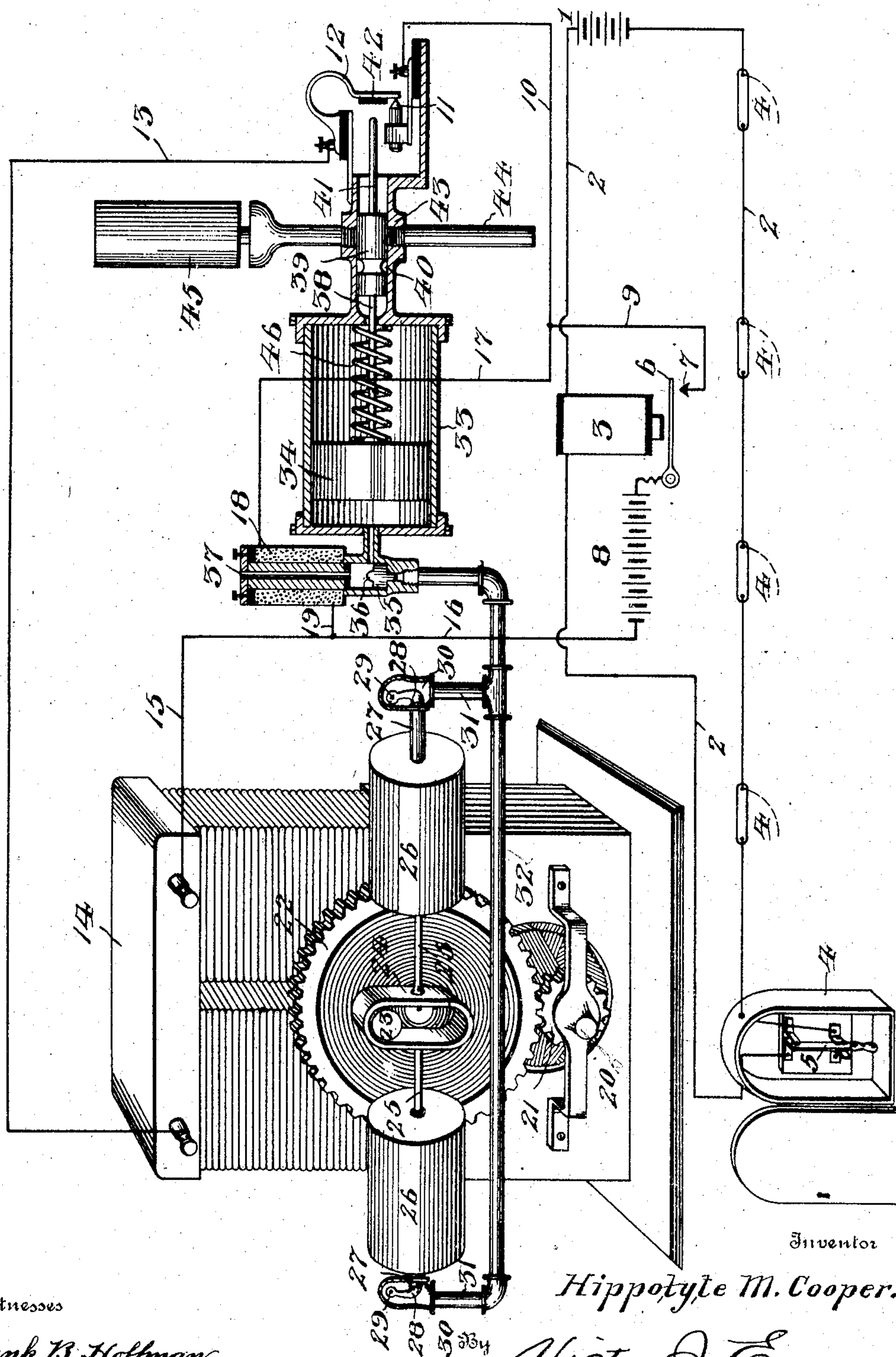


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H. M. COOPER.
ELECTRIC ALARM SYSTEM.
APPLICATION FILED OCT. 15, 1904.



Witnesses

Frank B. Hoffman.

W.H. Clarke.

Hippolyte M. Cooper.

Victor J. Evans
Attorney

Attorney

UNITED STATES PATENT OFFICE.

HIPPOLYTE M. COOPER, OF COOPERS PLAINS, NEW YORK.

ELECTRIC ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 790,189, dated May 16, 1905.

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To all whom it may concern:

Be it known that I, HIPPOLYTE M. COOPER, a citizen of the United States, residing at Coopers Plains, in the county of Steuben and State of New York, have invented new and useful Improvements in Electric Alarm Systems, of which the following is a specification.

This invention relates to electric alarm systems.

The objects of the invention are to improve and simplify the construction of such systems; furthermore, to increase their efficiency in operation and to decrease the expense attending their manufacture and instalment.

With the foregoing and other minor objects in view, which will appear as the description proceeds, the invention resides in an alarm system comprising an initial circuit which includes a plurality of alarm-boxes, each having suitable circuit-breaking means therein, a primary circuit including novel means for causing the actuation of an alarm, a parallel circuit for permitting the continued actuation of the alarm, and means controlled by the breaking of the initial circuit for closing the primary and parallel circuits.

The invention also resides in the particular combination and arrangement of parts and in the details of construction hereinafter described and claimed as a practical embodiment thereof.

In the accompanying drawing, forming part of this specification, the figure is a partly-sectional, partly-perspective, and partly-diagrammatic view of an alarm system constructed in accordance with the invention.

Referring to the drawing, the initial circuit includes a battery 1, wire 2, magnet 3, and a plurality of alarm-boxes 4, each having a suitable circuit-breaking device, such as a knife 5. The initial circuit is normally closed, for which reason the magnet 3 is energized sufficiently to attract and hold the armature 6, which is included in the primary circuit hereinafter described. When the initial circuit is broken by actuating the knife 5 in any one of the alarm-boxes 4, the magnet 3 is de-energized and permits the armature 6 to drop by gravity into engagement with the contact 7, which is also included in the primary cir-

cuit. The primary circuit includes the battery 8, armature 6, contact 7, wires 9 and 10, contact-point 11, contact-spring 12, wire 13, motor 14, and wires 15 and 16. The parallel circuit includes the battery 8, armature 6, contact 7, wires 9 and 17, magnet 18, and wire 19.

From the foregoing description it will be apparent that the breaking of the initial circuit by deenergizing the magnet 3 serves to permit the armature 6 to drop against the contact 7, and thus close both the primary and parallel circuits. The motor 14, which is included in the primary circuit, may be of any suitable form and construction. In the embodiment of invention illustrated in the drawing said motor comprises an armature-shaft 20, having thereon a pinion 21, which serves to operate a gear-wheel 22, provided with an eccentrically-disposed pin or crank 23, which operates a sleeve 24, having connected to opposite sides thereof the pistons 25 of air-compressors 26, the outlet-pipes 27 of which are controlled by suitable one-way or check valves 28, pivoted at 29 and adapted to swing open when air is forced out of the compressors or cylinders 26 and to swing closed immediately after that operation to prevent the reentrance of air upon the suction-stroke of the compressors. The check-valves 28 are located in suitable air-chambers 30, which communicate, by means of pipe-sections 31, with an air-supply pipe 32, communicating with a cylinder 33, having therein a piston 34. Arranged in the piping 32 at a convenient point is an electrically-operated valve 35, which is formed with a projection 36, adapted to close the end of an outlet-passage 37, extending through the magnet 18. When the parallel circuit is closed and the magnet 18 is energized, the valve 35 is drawn upward so as to close the passage 37 through the magnet 18. Connected with the piston 34 is a piston-rod 38, having thereon a slide-valve 39, formed with an annular groove 40. Upon the outer end of the slide-valve 39 is a rod 41, which is adapted to strike against an insulating-block 42 on the contact-spring 12. Associated with the casing 43 of the slide-valve 39 is a line of piping 44, which leads from a suit-

able source of steam or other fluid supply and communicates with a steam-whistle 45. The piston-rod 38 is surrounded by a coil-spring 46, which is located within the cylinder 33 and bears against the piston 34, said spring serving to retract the piston when the pressure within the cylinder is relieved.

Constructed as above described, the operation of the improved alarm system is as follows: It will be understood that the initial circuit, including the battery 1, wires 2, magnet 3, and alarm-boxes 4, is normally closed, as heretofore explained, whereby the magnet 3 is energized in such manner as to attract the armature 6, thus maintaining the primary and parallel circuits normally open. When an alarm is to be sounded, the knife 5 in one of the alarm-boxes is raised, thus breaking the initial circuit and causing the armature 6 to descend by gravity until it rests against the contact 7. This movement of the armature 6 closes simultaneously the primary and parallel circuits. The primary circuit, through the battery 8, armature 6, contact 7, wires 9 and 10, contact-spring 12, wire 13, motor 14, and wires 15 and 16, causes the actuation of the motor 14 and air-compressors 26, which act to force the air into the piping 32. The closing of the parallel circuit through the battery 8, armature 6, contact 7, wires 9 and 17, magnet 18, and wires 16 and 19 causes the magnet 18 to be energized, with the result that the valve 35 is attracted thereto and the projection 36 effectually closes the outlet 37. The air compressed by the cylinders 26 passes into the cylinder 33 and forces the piston 34 toward the right. As soon as the slide-valve 39 on the piston-rod 38 is moved a sufficient distance to cause the annular groove 40 to register with the piping 44 the steam-whistle is sounded. At this moment the rod 41 strikes against the insulating-block 42 on the contact-spring 12 and forces said spring away from the contact-point 11, thus breaking the primary circuit and stopping the operation of the motor, for which reason an excessive supply of compressed air to the cylinder 33 is avoided. The compressed air which remains in the pipe 32 and cylinder 33 is sufficient to hold the piston in its advanced position, so that the steam-whistle continues to sound. When it is desired to stop the sounding of the whistle, the initial circuit is closed, thus energizing the magnet 3 and causing the armature 6 to break the parallel circuit by moving away from the contact 7. As soon as the parallel circuit is broken the magnet 18 is deenergized and the valve 35 descends by gravity into its lowest position, thus permitting the air in the cylinder 33 to exhaust through the outlet 37. The coil-spring 46 serves to move the piston 34 back to its normal position, so that the slide-valve 39 stops the sounding of the whistle and the rod 41 permits the contact-spring 12 to move again into contact with the point 11,

thus closing the gap in the primary circuit and preparing it for the next operation of the alarm.

Changes in the precise embodiment of invention illustrated and described may be made within the scope of the following claims without departing from the spirit of the invention or sacrificing any of its advantages.

Having thus described the invention, what is claimed is—

1. An electric alarm system, comprising an initial circuit, a primary circuit, a parallel circuit, means controlled by the initial circuit for closing the primary and parallel circuits, means controlled by the primary circuit for causing the actuation of an alarm, means for automatically breaking the primary circuit, means controlled by the parallel circuit for permitting the continued actuation of the alarm after the breaking of the primary circuit, and means actuated by the initial circuit for breaking the parallel circuit.

2. In an electric alarm system, a normally closed initial circuit, including alarm-boxes, having circuit-breaking means, and a magnet, a primary circuit, a parallel circuit including a magnet, an armature associated with the magnet of the initial circuit, and actuated by the breaking of said initial circuit to close the primary and parallel circuits, a motor connected with the primary circuit, an air-pump operated by said motor, a controlling-valve for said air-pump operated by the magnet of the parallel circuit, a piston operated by the pump, and means connected with the piston for sounding an alarm and breaking the primary circuit.

3. An electric alarm system, comprising an initial circuit, including a battery, a magnet, and a plurality of alarm-boxes having circuit-breaking means, an armature associated with the magnet of said initial circuit, a primary and a parallel circuit connected with said armature, said parallel circuit including a magnet, a motor operated by the primary circuit, a plurality of air-compressors operated by said motor, a cylinder, piping connecting said air-compressors with said cylinder, a valve in said piping operated by the magnet of the parallel circuit, an air-outlet controlled by said valve, a piston in said cylinder, a piston-rod connected with said piston, a coil-spring surrounding said piston-rod, a slide-valve on said piston-rod, a whistle controlled by said slide-valve, a rod connected with said slide-valve, and a contact-spring associated with said primary circuit, and adapted to be struck by said rod.

4. An electric alarm system, comprising an initial circuit, a primary circuit, a parallel circuit, means controlled by the breaking of the initial circuit for closing the primary and parallel circuits, means controlled by the primary circuit for causing the actuation of an alarm, means operable upon the actuation of the

alarm for breaking the primary circuit, means
controlled by the parallel circuit for permit-
ting the continued actuation of the alarm, and
means actuated by the closing of the initial
5 circuit for breaking the parallel circuit.

5. An electric alarm system comprising
three circuits, means actuated by the first cir-
cuit for controlling the other two circuits,
means controlled by the second circuit for

causing the initial actuation of an alarm, and 10
means controlled by the third circuit for per-
mitting the continued actuation of the alarm.

In testimony whereof I affix my signature in
presence of two witnesses.

HIPPOLYTE M. COOPER.

Witnesses:

ABRAHAM GRIDLEY,
JAMES J. HOLDSWORTH.