

O. DE CHAMP.
FIRE ALARM SYSTEM.
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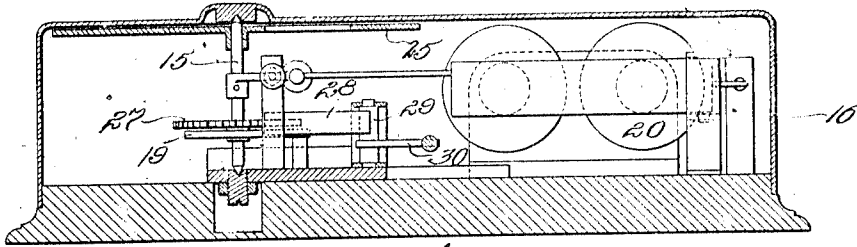


Fig. 2.

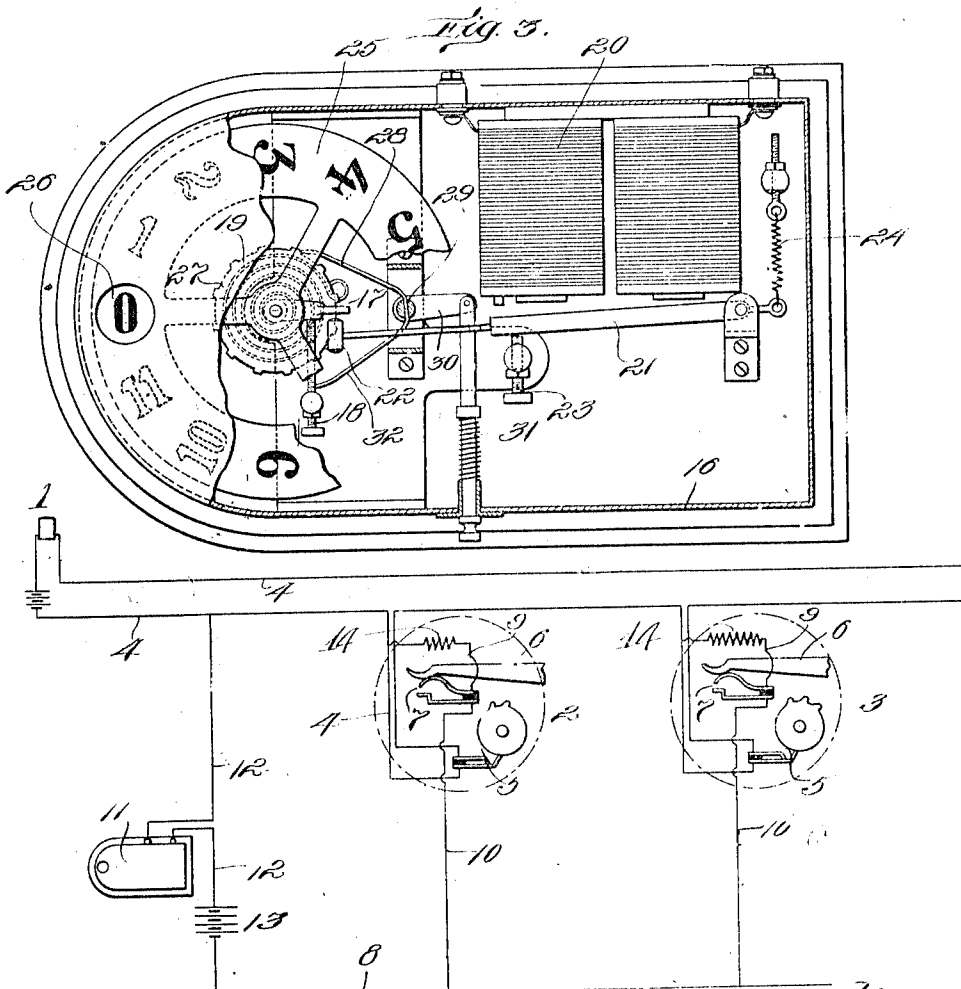


Fig. 1.

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FIRE-ALARM SYSTEM.

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To all whom it may concern:

Be it known that I, OBED DE CHAMP, a citizen of the United States, residing at Everett, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Fire-Alarm Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to fire alarm signal systems in which an alarm is sounded corresponding to any box of the system which may be "pulled" or "rung in." As usually constructed these systems are provided with an electrically operated or controlled mechanism for sounding the alarm at the engine house or stations on the circuit either directly or through relay mechanism at a central station. It is necessary, therefore, for the firemen to wait until the number of the box has been once sounded before they can determine the location of the box and whether or not the box rung in is one to which they must respond. This delay frequently results in a serious loss which might have been avoided had the firemen reached the fire earlier.

It is the object of the present invention to avoid this delay, and to that end the invention contemplates providing the usual fire alarm system with a supplemental electrically controlled mechanism for immediately and visually indicating the number of the box rung in the indicating mechanism of which is operated in ringing in a box but is not dependent upon the operation of the mechanism which sounds the alarm. Since the indicating devices of this supplemental mechanism operate to visually and immediately indicate the number of the box, the firemen may respond to the call without waiting for the operation of the alarm sounding mechanism. The specific construction of the supplemental indicating mechanism, and the specific arrangement of the circuit and connections for operating it, are not material to the broader features of the invention. It is preferred, however, to employ a construction of indicating mechanism, and an arrangement of circuits and devices for controlling the same, which are novel and which embody certain further features of invention.

The various features of the invention will be readily understood from an inspection of the accompanying drawings and the following detailed description of the mechanism indicated and illustrated therein.

In the drawings Figure 1 is a diagrammatic view illustrating a fire alarm system embodying the present invention in its preferred form; Fig. 2 is a sectional elevation of a novel form of indicating mechanism which it is preferred to employ in embodying the broader features of the invention in a fire alarm system; and Fig. 3 is a plan view of the mechanism shown in Fig. 2, a part of the inclosed casing being broken away.

In the system illustrated in Fig. 1 the mechanism for sounding the alarm is indicated at 1, and two of the alarm boxes of the system are indicated at 2 and 3. The alarm boxes may be of any usual construction, and are connected in series by the circuit wires 4 of the sounding mechanism in the usual manner. The alarm circuit is the usual closed circuit, and each box is provided with the usual make and break mechanism, indicated at 5, and with the usual lever or handle for ringing in or pulling in the box. As thus far described the system is of the usual construction, and operates to sound an alarm at the stations and engine houses in the usual manner whenever the lever or handle of a box is depressed and released.

In order that the location of the box rung in may be immediately indicated in the proper engine house or houses, or at a central station, an indicating mechanism at the station or stations is so connected with the boxes that it is operated to visually indicate a number corresponding to the number of the box whenever a box is rung in.

In the construction shown the various boxes are provided with circuit-closing devices which are connected in parallel in the indicator circuit, and are actuated to close the circuit in pulling in the box. The circuit wire of the alarm circuit is preferably utilized as one of the line wires of the indicator circuit, and the indicator circuit may be completed through a return wire or through the ground. The circuit closing devices are indicated at 7, and are connected in parallel with the line wire 4 and the line wire or ground 8 by cross-circuit wires 9 and 10. The indicating mechanism shown

at 11 is connected with the line wire 4 and with the ground or wire 8 through wires 12, in one of which a battery 13 or other source of electric current is located. When any one of the levers 6 is depressed the corresponding circuit closing device 7 is operated to close the indicator circuit and the indicator is instantly operated. The indicating mechanism is so constructed that its operation will vary with the current passing through the circuit which will in turn vary with the resistance in the circuit when it is closed by pulling in any particular alarm box. In order that the proper variations in the current passing through the indicator circuit may be secured, resistances 14 are included in the cross-circuits 9 and 10, and are so proportioned that the proper current will pass through the indicator mechanism 11 to cause the number corresponding to the box which is rung in to be brought into view or visually indicated. The construction of indicating mechanism which it is preferred to use is shown in Figs. 2 and 3.

In the construction shown, the indicating devices proper are operated or controlled by the movement of a shaft 15 which is journaled within an inclosing casing 16. The shaft is provided with a laterally projecting arm 17, and is held in normal position with the arm against a stop screw 18, by a spiral spring 19. The means for actuating the shaft comprises a magnet 20 included in the indicator circuit, and an armature 21, the free end of which carries a hammer 22 arranged to strike a blow upon the arm 17 when the armature is attracted by the magnet. The armature is held normally against a stop screw 23 by a spring 24. The force of the blow struck by the hammer upon the arm 17, and therefore the distance through which the shaft 15 is moved, will depend upon the current passing through the magnet 20 when the magnet is energized. Since the current passing through the indicator circuit varies in accordance with the box which is rung in, the movement imparted to the shaft 15 when the circuit is closed by ringing in a box will depend upon the box which is rung in. The indicating devices operated or controlled by the movement of the shaft are so arranged that the movement of the shaft produced by the ringing in of any box causes a number corresponding to this box to be brought into view or designated. In the construction shown the indicating devices are directly operated by the shaft, and consist of a disk 25, provided with a series of numbers arranged to be brought into register with an opening 26 formed in the casing 16 by the movements of the shaft 15. The disk is so calibrated that it will be moved through the proper distance to bring the number corresponding to any given box into register with the open-

ing 26 when that box is rung in. In order that the number of the box may remain in register with the opening 26 when the corresponding box is rung in, the shaft 15 is provided with a wheel 27 having teeth corresponding to the numbers on the disk 25, and a pawl 28 is arranged to engage the teeth and prevent return movement of the disk and shaft. This pawl is mounted in a rock shaft 29 which is connected through an arm 30 to a spring pressed rod 31, the end of which projects through the casing 16. By operating the rod 31 the pawl 28 may be disengaged from the wheel 27, so that the disk 25 may return to initial position, thus resetting the indicating mechanism. When the pawl 28 is disengaged from the wheel 27, a second pawl 32 carried by the shaft 29 is brought into engagement with the wheel, and operates to prevent rebound of the shaft 15 when the arm 17 engages the stop screw 18. This pawl is disengaged from the wheel and the pawl 28 reengaged therewith when the rod 31 is released.

While it is preferred to employ the specific construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential to the broader features of the invention, and may be varied and modified without departing therefrom.

Having explained the nature and object of the invention, and specifically described one form of apparatus in which it may be embodied, what I claim is:—

1. A fire alarm system, having, in combination, an alarm sounding mechanism and call boxes connected in series in the alarm circuit, a supplemental indicator circuit, circuit closing devices at the call boxes connected in parallel in the supplemental circuit, a box indicating mechanism in the supplemental circuit and means for simultaneously pulling in the boxes and operating the circuit closing devices, substantially as described.

2. A fire alarm system, having, in combination, an alarm sounding mechanism and call boxes connected in series in the alarm circuit, a supplemental indicator circuit, circuit closing devices at the call boxes connected, in parallel in the supplemental circuit and arranged to be operated in pulling in the boxes, and a box indicating mechanism in the supplemental circuit, substantially as described.

3. A fire alarm system, having, in combination, an alarm sounding mechanism and call boxes connected in series in an alarm circuit, a supplemental indicator circuit, indicating mechanism in the circuit the operation of which varies with the current passing therethrough, circuit closing devices at the call boxes connected in parallel in the supplemental circuit, varying resistances

connected in series with the circuit closing devices at the call boxes and means for simultaneously pulling in the boxes and operating the circuit closing devices, substantially as described.

4. A fire alarm system, having, in combination, an alarm sounding mechanism, a plurality of call boxes, the sounding mechanism being connected in circuit with the several call boxes and arranged to sound the number of the call box which is operated, and an indicating mechanism connected in circuit with the several call boxes and arranged to be operated in pulling in the boxes to show the designating character of the particular call box which is operated, substantially as described.

5. A fire alarm system, having, in combination, an alarm sounding mechanism, a plurality of call boxes, the sounding mechanism being connected in circuit with the call boxes and arranged to sound the number of the call box which is operated, a supplemental indicator circuit, an indicator mechanism in the supplemental circuit comprising an electrical magnet, an armature, a movable device to which the armature imparts an impulse when attracted by the magnet, designating devices the operation of which depends upon the movement imparted to the movable device, circuit closing devices at the

call boxes connected in parallel in the supplemental circuit and arranged to be operated in pulling in the boxes, substantially as described.

6. A fire alarm system, having, in combination, an alarm sounding mechanism, a plurality of call boxes, the sounding mechanism being connected in circuit with the several call boxes and arranged to sound the number of the call box which is operated, and an indicating mechanism electrically connected to the several call boxes and arranged to be operated in pulling in the boxes to show the designating character of the particular call box which is operated, substantially as described.

7. A fire alarm system, having, in combination, an alarm sounding mechanism and call boxes connected in series in the alarm circuit, a supplemental indicating mechanism connected with the alarm circuit and with an independent electric conductor, circuit closing devices at the call boxes arranged to be operated in pulling in the box and connected in parallel with the alarm circuit and said independent conductor, substantially as described.

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