

988,171.

Patented Mar. 28, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

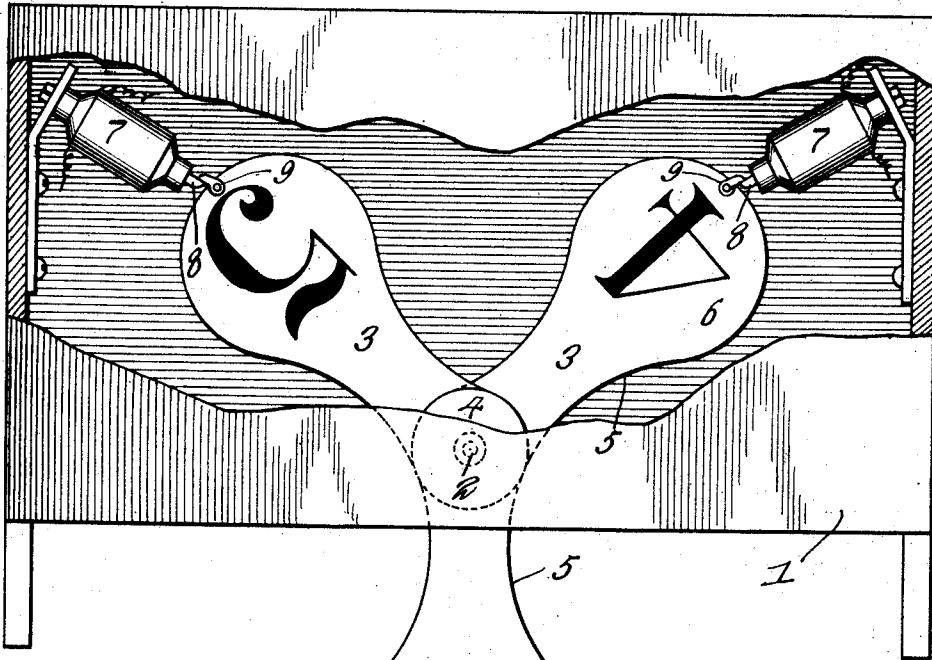


Fig. 4.

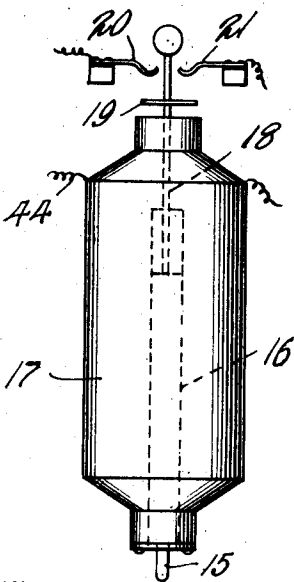
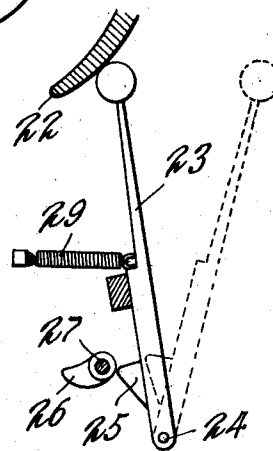


Fig. 5.



Inventor
Hazel B. Bush

Witnesses

Frank B. Hoffman.
D. W. Gould.

By *Victor J. Evans*
Attorney

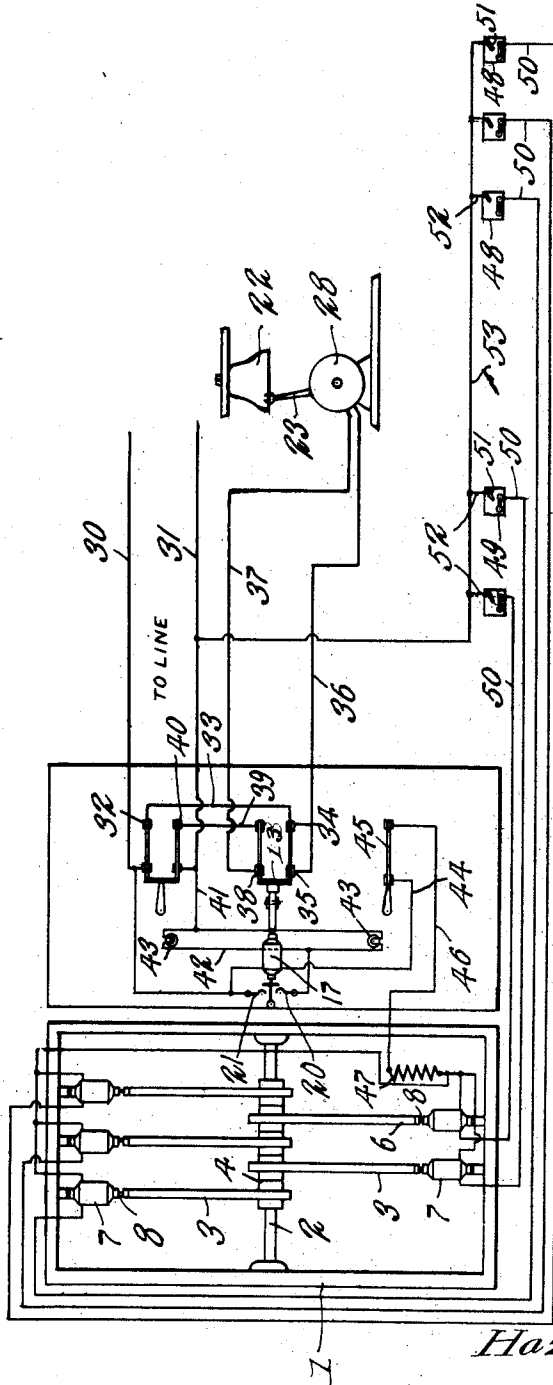
H. B. BUSH.
FIRE ALARM SYSTEM.
APPLICATION FILED MAY 25, 1909.

988,171.

Patented Mar. 28, 1911.

3 SHEETS-SHEET 3.

Fig. 6.



Inventor

Hazel B. Bush

Witnesses

Frank B. Hoffman.
D. W. Gould.

By

Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

HAZEL BURTON BUSH, OF LITTLETON, COLORADO.

FIRE-ALARM SYSTEM.

988,171.

Specification of Letters Patent.

Patented Mar. 28, 1911.

Application filed May 25, 1909. Serial No. 498,139.

To all whom it may concern:

Be it known that I, HAZEL B. BUSH, a citizen of the United States, residing at Littleton, in the county of Arapahoe and State of Colorado, have invented new and useful Improvements in Fire-Alarm Systems, of which the following is a specification.

The invention relates to an improvement in fire alarm systems and is particularly directed to a system in which the power may be derived directly from any power circuit preferably of the alternate current type.

The main object of the present invention is the provision of a fire alarm system in which an alternating current may be used directly from a power circuit, the system including a series of normally open circuits one of which is automatically closed in the manual closing of the other, whereby the minimum current is used during operation of the system and the entire system circuit is free of current at all times except when an alarm is being sounded.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is an elevation of the indicator at the central station, the forward wall of the casing being partly broken away. Fig. 2 is a rear elevation of the same with the rear wall removed. Fig. 3 is a section on line 3—3 of Fig. 2. Fig. 4 is an elevation of the switch controlling coil. Fig. 5 is a detail, illustrating the sounding mechanism for the bell. Fig. 6 is a diagrammatic view, illustrating the wiring system.

Referring particularly to the accompanying drawings, my improved fire alarm system includes a case 1 open at bottom, within which near the open bottom is arranged a pivot rod or fixed shaft 2. Mounted on the rod for independent movement are a series of indicating paddles 3, preferably of the form shown more clearly in Fig. 1 of the drawings and including a disk end 4 mounted on the rod, a narrow elongated neck 5 projecting from the disk and an enlarged circular head 6 on the front or both surfaces of which is arranged a number or other data to indicate to which particular

station the paddle corresponds. The paddles are normally housed within the case and held in relatively elevated position by a means to be presently described, the operation of such means releasing the paddles and permitting them to drop by gravity to a position to expose the head 6 below the case, indicating an alarm from the particular station to which the exposed paddle corresponds. The paddles are alternately arranged, when in normal position, in opposite directions from the pivot rod 2, that is the first paddle will be elevated to the right, the second to the left and so on. Secured to the side walls of the case are a series of electro-magnets or solenoids 7, the core 8 of which in normal position is adapted to engage a catch 9 carried by the head of the paddle, so that when the paddle is elevated it will be held in such position by the end of the core, but upon energization of the electro-magnet the core will be withdrawn, the paddle released and allowed to gravitate to exposed or indicating position. There is, of course, one solenoid for each paddle, and the respective solenoids are on independent circuits leading respectively from the particular stations, as will presently appear.

Secured upon the rear of the case, or in a compartment arranged on the rear thereof is a bar 10 carrying at its lower end a pair of rearwardly extending downwardly inclined ears 11. A lever 12 is pivotally mounted intermediate its ends between the ears. A double blade switch 13 is mounted on the case below the lever 12, a spring 14 operating to draw the switch to operative position when the parts are operated. The upper or handle end of the switch is designed to overlap the lower end of the lever 12, while the upper end of said lever underlies a projection 15 extending from a core 16 of a solenoid 17 secured to the arm 10. By this construction the switch will be held in inoperative position as long as the solenoid is deenergized with the upper end of the lever 12 engaged beneath the projection of the solenoid core, but immediately upon releasing said lever, by the energization of the solenoid, the lower end of the lever is free to be moved by the switch and the spring 14 per-

mitted to move the switch into operative position, for a purpose which will presently appear.

The solenoid core 16 carries a rod-like member 18, projecting from the upper end thereof, which beyond the coil is provided with a bridging contact strip 19 designed when the electro-magnet is energized to bridge a break between two fixed contacts 20 and 21.

An alarm is arranged on or adjacent the casing including a bell 22 adapted to be sounded by a striker arm 23 pivotally mounted at its lower end on a suitable rod 24 and carrying an offset 25 designed to be engaged by a cam 26 mounted on the armature shaft 27 of an alternating current motor 28. A spring 29 is arranged to draw the striker toward the bell and, therefore, induce the sounding of the latter, the cam on the armature shaft being operative to force the striker from the bell against the tension of the spring.

Current is supplied to the apparatus from any alternating power circuit, as electric light mains. From such mains the current is fed to the apparatus through main conductors 30 and 31, the former of which leads through a manually controlled double blade switch 32, said conductor leading to one of the contacts of said switch, through one of the blades thereof, and by a conductor 33 to one of the contacts 34 of the switch 13, through the blade thereof to the contact 35 engaged by said blade and from the said contact by a conductor 36 to the motor 28, from the motor a conductor 37 returns to the opposing contact 38 of the switch 13 opposing the contact 35, through the second blade of said switch and a conductor 39 to the remaining contact 40 of the hand controlled switch through the blade thereof to the contact with which said blade coöperates and from said contact by a conductor 41 to a signal light circuit 42 including red lights 43. The circuit of the signal lights includes the winding of the solenoid 17, being led from said solenoid in one direction to one of the contacts, as 21, the other contact 20 leading directly to the signal light circuit. The remaining terminal of the solenoid winding leads by a conductor 44 to and through a single blade switch 45 and by a conductor 46 from said switch into the casing 1 and preferably through a resistance 47. The conductor 46 is in circuit with each of the solenoids 7, hereinafter termed the paddle solenoids, the latter being connected across said conductor. Each of the signal boxes 48 includes a lever 49 in electrical connection with one conductor 50 and adapted to be moved to position to engage a spring

terminal 51 of a second conductor 52. The conductor 52 of all the boxes leads to a conductor 53 which is connected to the main conductor 31, while each conductor 50 of each box leads directly to the paddle solenoid controlling the paddle corresponding to the particular box.

In operation when any of the boxes are pulled, the circuit is immediately closed through the solenoid 17, and the particular paddle solenoid, it being understood that the main conductor 31 is extended beyond the box conductor 53 and connected directly to the conductor 41 leading to the light circuit. The paddle corresponding to the box pulled is released and drops, indicating to the observer that the alarm has been sounded from a certain box. At the same time the switch 13 is released, closing the circuit through the motor 28 and sounding the alarm. During the energization of the switch solenoid the contacts 20 and 21 are bridged and the signal lights 43 flash.

In the case of a short circuit on the signal lines leading from any box the signal lights 43, which are but momentarily lighted in the sending of an alarm, would remain lighted, indicating an improper condition of the circuit and permitting the operator to break the circuit by means of the switch 45 until the difficulty could be corrected. The switch 32 is a safety switch used in resetting the automatic switch.

It is, of course, to be understood that the annunciator can carry any number of paddles or targets and that the respective solenoids are of the type for use with alternating current. The entire circuit is open until the box is pulled, so that no current whatever is utilized until the system is actually sounding an alarm. Furthermore, current is taken from the usual power circuits, the resistance 47 reducing the same to avoid burning out the target solenoids. There is no waste of current in the system and, therefore, the entire system may be wired for any locality and the initial expense of installation is all that is necessary except when the system is in use for sending an alarm. All the parts are automatic and require no attention on the part of the operator, and when the alarm has been once pulled and released the target will drop and remain in lowered position, while the motor will continue the audible alarm notwithstanding the fact that there is no current flowing over the system except from the mains to the motor.

Having thus described the invention what is claimed as new, is:—

A fire alarm system including a drop, a circuit controlling the same, a solenoid arranged in said circuit, a visible signal, a cir-

cuit therefor, said circuit being broken adjacent the solenoid, a bridge plate operated by the solenoid to close the visible signal circuit when the solenoid is energized, an audible alarm, a circuit therefor, a switch normally tensioned to close the audible alarm circuit, and means effective while the solenoid is deenergized to hold said switch from circuit closing operation, said switch being

released for circuit closing operation upon the energization of the solenoid.

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

HAZEL BURTON BUSH.

Witnesses:

GEO. COMSTOCK,
HENRY KRAFT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
