May 23, 1939. H. R. ALKER 2,159,650

FIRE ALARM

Filed June 3, 1937 2 Sheets-Sheet 1

Fig. 1.

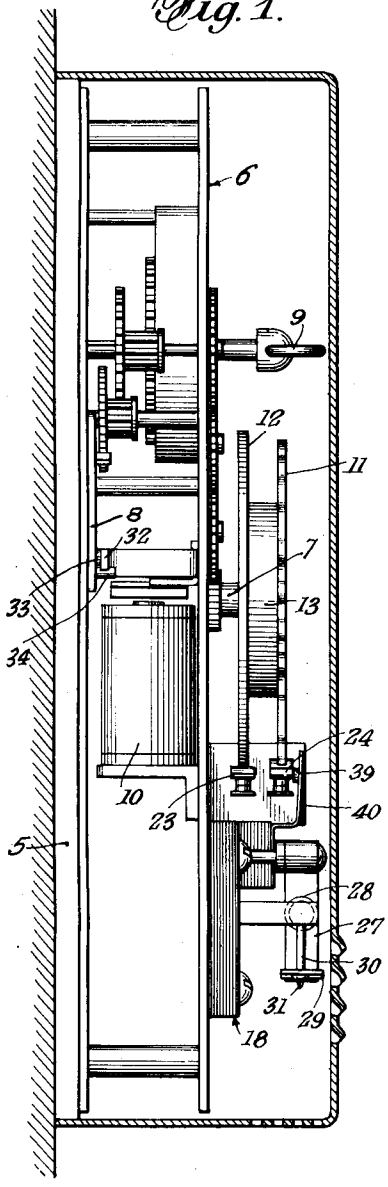
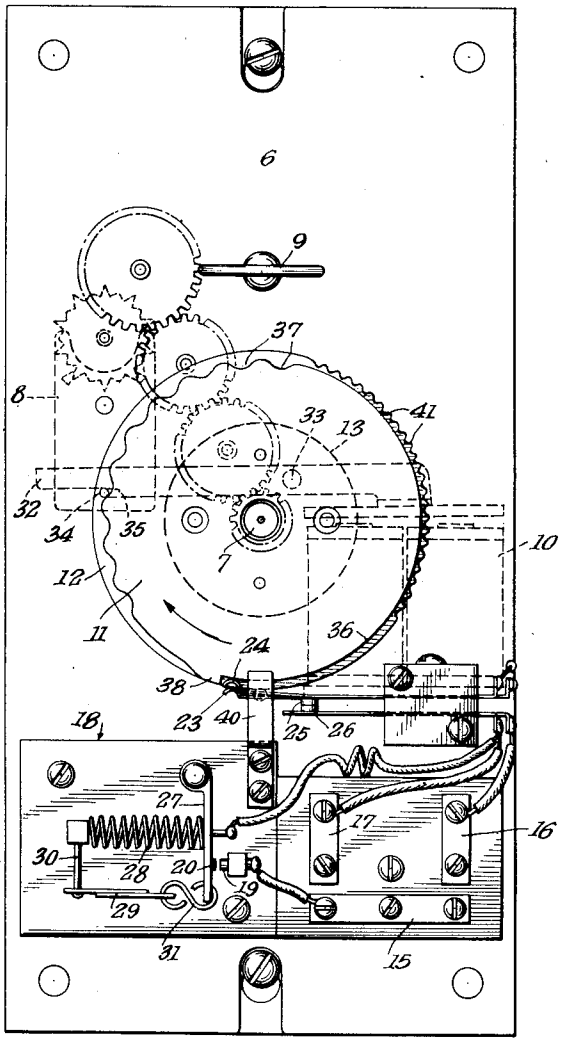


Fig. 2.



INVENTOR
HAYWARD R. ALKER

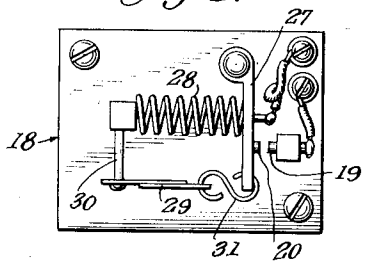
BY
Mitchell & Becket
ATTORNEYS

May 23, 1939. H. R. ALKER 2,159,650

FIRE ALARM

Filed June 3, 1937 2 Sheets-Sheet 2

Fig. 3.



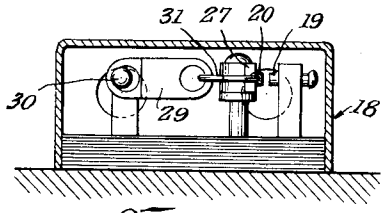


Fig. 4.

Fig. 5.

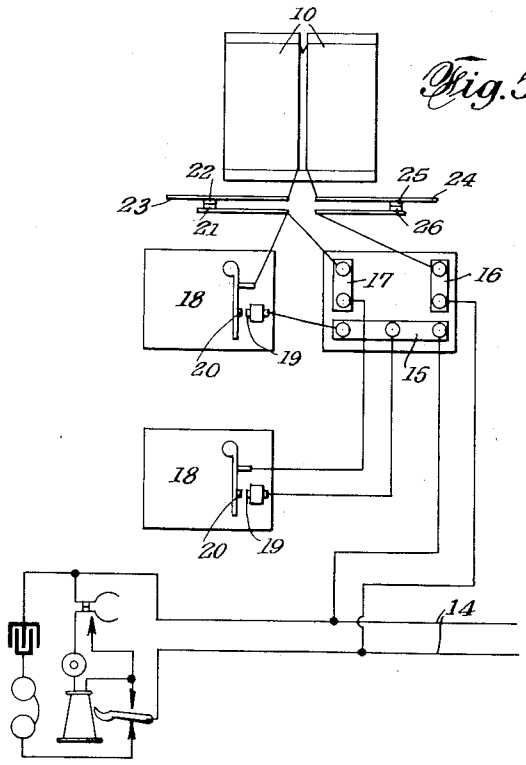


Fig. 6.

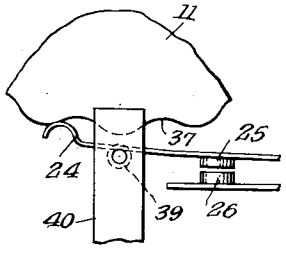
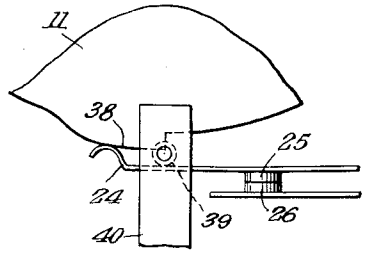


Fig. 7.



INVENTOR
HAYWARD R. ALKER

BY
Mitchell & Richert
ATTORNEYS

Patented May 23, 1939

2,159,650

UNITED STATES PATENT OFFICE

2,159,650

FIRE ALARM

Hayward R. Alker, Kensington, Conn.

Application June 3, 1937, Serial No. 146,148

3 Claims. (Cl. 179—5)

My invention relates to a fire alarm system operable by and through a regular telephone circuit.

It is an object of the invention to provide an improved form of fire alarm in connection with a telephone either of the dial or ordinary type, wherein central or a certain number is first called and a signal thereafter transmitted.

Another object is to provide a fire alarm system in connection with a telephone, so arranged that after central has been automatically called and notified of a fire the telephone at the calling station may be called back by central.

It is another object to provide several improved features in connection with a telephone fire alarm system with a view to great simplicity, ease of installation and maintenance, as well as dependability.

Briefly stated, in a preferred form of my invention I employ the regular house telephone circuit and connect the desired number of thermostatic devices, each in parallel therewith. The second or thermostatic circuit or circuits are maintained open until such time as a fire occurs to melt a fuse for closing the second circuit. Upon closing the second circuit, current flows from the telephone circuit to actuate means for starting a motor, such as a clockwork, and the motor is arranged to actuate means for first calling central and thereafter transmitting a fire signal over the telephone circuit. The circuit arrangement is such that the operator at central may call back on the signaling station so as to notify the telephone subscriber of the fire which may not already have been discovered by such subscriber.

In the drawings which show, for illustrative purposes only, a preferred form of the invention—

Fig. 1 is a vertical section through a case or housing and the principal parts of my improved alarm system;

Fig. 2 is a front view in elevation of the mechanism shown in Fig. 1, the casing being removed;

Fig. 3 is a detail face view of a thermostatic device forming part of my invention;

Fig. 4 is a side view of the thermostatic device shown in Fig. 3 and enclosed in a suitable vented case or housing;

Fig. 5 is a diagrammatic view of the circuit connections of my improved fire alarm;

Fig. 6 is an enlarged fragmentary view of a dialing disk and contact device actuated thereby;

Fig. 7 is a view similar to Fig. 6, illustrating the dialing disk in a different angular position and the contact device in its final actuated position.

My improved fire alarm device may include a base member 5 carrying the principal parts of the mechanism and which may be secured to a wall at any suitable location in the house. The base 5 carries a motor such as a clockwork, designated generally 6, and which need not be specifically described except to say that the clockwork finally is geared to rotate the shaft 7 and the clockwork includes an escapement and a balance arm 8. The motor, if a spring clockwork, may be wound by means of the usual key 9. The base 5 carries a pair of magnetic or solenoid coils 10—10 connected in series, for a purpose to be later described. The motor shaft 7 carries what may be termed a code wheel including, in the present instance, a dialing disk 11 and a signal disk 12. The disks 11—12 may be formed of metal and are insulated from each other and from the shaft 7, a convenient form of construction comprising a disk of insulation 13 fixedly carried by the shaft 7 and upon which disk 13 the disks 11—12 are mounted, the inner disk 12, at least, having a central aperture sufficiently large to properly clear the shaft 7 so as to avoid contact therewith. The dialing disk 11, as will be later described, is employed for calling or dialing central. The signal disk 12, as will be later described, serves to transmit a suitable signal after central has been called.

The electrical connections of my improved system may be best traced in Fig. 5. The usual telephone circuit 14 is connected to the subscriber's telephone (shown diagrammatically). One wire is connected to a contact bar 15, while the other wire is connected to a return contact bar 16. There is a third contact bar 17 and all three contact bars may be carried by an insulated base on the main base 5, as will be clear from Fig. 2. Distributed at strategic locations throughout the house to be protected by my fire alarm are a plurality of thermostatic devices 18—18, and such thermostatic devices involving contact points 19—19 are connected to the contact bar 15, while the other contact points 20—20 are connected to the contact bar 17. All the thermostatic devices are connected in parallel with each other and each will be seen to be in parallel with the telephone circuit 14. The thermostatic or second circuit is normally open by reason of the separation of the contacts 19—20, as shown in Figs. 3, 4 and 5. The contact points 20, either directly or through the contact bar 17,

are connected to a contact member 21 adapted to be engaged by a properly positioned contact point 22 carried on a spring arm 23, which, as will be later described, is actuated by the signal disk 12 for transmitting the signal. From the spring arm 23 there is a connection to one terminal of the coils 10—10 and the other terminal of the coils is connected to a spring arm 24 carrying a contact point 25 for engagement with a properly positioned contact point 26. The contact point 26 is electrically connected to the contact bar 16 so as to complete the circuit heretofore noted. The spring arm 24, as will be described, is actuable by the dialing disk 11 for dialing central.

Each of the so called thermostatic devices, as shown more particularly in Figs. 3–4, comprises a suitable base plate carrying the fixed contact point 19 and the coacting contact point 20 is carried by a pivoted lever 27 which is urged by means of a compression spring 28 in a direction to close the contacts 19—20. The lever 27 is held against the compression spring 28 so as to maintain the points 19—20 separated, by means of a fusible link 29 carried at one end as by means of a pin 30 on the base and at the opposite end by a wire hook 31 hooked to the lever 27. The pin 30 and hook 31 are preferably of such small section as to conduct heat from the fusible link quite slowly so that the latter may fuse as intended. The remainder of the mechanism may be best described in connection with the operation of the system, which operation is substantially as follows:

When a fire occurs in the location of one of the thermostatic devices, the appropriate fusible link in melting releases the lever so as to cause the compression spring 28 to close the contacts 19—20 and thereby put the telephone circuit, the aforementioned thermostatic or second circuit, including the contact points 19—20, magnetic coils 10—10 and the contact devices associated therewith, all in circuit. The entire circuit will then be energized by the telephone circuit. As soon as the coils 10—10 are energized, the armature 32, which is a lever balanced about its pivot 33, is moved clockwise as shown in Fig. 2. The escapement or balance lever 8 carries a pin 34 which is engageable by a detent or latching notch 35 in the balanced armature lever 32. Therefore, when the armature lever is rocked clockwise by the magnetic coils, the balance lever 18 is released and the clockwork set in motion. The clockwork, as heretofore stated, rotates the shaft 7 and with it the disks 11—12.

The disk 11, termed herein the dialing disk, has a relatively smooth contact portion 36 contacting with the spring contact arm 24 so as to maintain the contacts 25—26 closed, as shown in Figs. 5 and 2. When the disk 11 has rotated about half a revolution from its position shown in Fig. 2, the valleys or depressions 37—37 permit the contact arm 24 to spring up and separate the contact points 25—26 the number of times corresponding to the number of valleys 37. The action of separating the contacts 25—26 has the same effect as the hand dialing of a certain number, for example, the number corresponding to the calling of the operator or, as otherwise termed, dialing central. As soon as the dialing wheel 11 is rotated a distance sufficient to dial central, the raised cam portion 38 thereon engages the contact arm 24 and moves the same to an abnormally low position and when so moved a latch pin 39, carried by a spring arm 40, drops in over the contact arm 24 and latches the same in its downward position shown in Fig. 7. Thereafter, further rotation of the dialing disk 11 will not serve to dial central again. After central has been dialed as heretofore described, the signal disk 12 serves to actuate the contact arm 23 for affecting the telephone circuit to transmit a signal over the telephone circuit. For that purpose, the signal disk is provided with a plurality of closely arranged valleys or depressions 41—41, which serve to vibrate the contact arm 23 and transmit a distinct signal over the telephone circuit which the operator will recognize as a fire signal. The depressions or valleys 41 may be arranged only part way around the signal disk 12 and the signal buzzes will, of course, then be given only intermittently as the signal disk 12 continues to rotate. It will be seen that, by reason of the resistance of the magnetic coils 10—10, the ordinary use of the telephone will not be substantially impaired and central may call back the station from which the fire signal has been given so as to awake or notify occupants of the house where the fire may be.

It will be seen that I have provided an exceedingly simple, yet effective, fire alarm to be attached to an ordinary house telephone, either of the dial or ordinary type. The parts are relatively few in number and cheap to produce. There is little likelihood of the system getting out of order or failing to work when called upon to do so. When installed and the second circuit is maintained open, by reason of the fusible links my fire alarm system is, in effect, disconnected from the telephone circuit and of course has no effect thereon and does not impair the availability of the telephone for use at all times and under all conditions; and even when the second circuit is closed, by reason of a fire or accident to one of the fusible links or other parts, the telephone will still be usable because of the resistance in the circuit provided by the coils 10—10.

While the invention has been described in considerable detail and a preferred form illustrated, it is to be understood that various changes may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In a device of the character indicated, a telephone circuit, a motor, a thermostatic means for starting said motor, a dialing means actuated by said motor to actuate a contact device for dialing central, said dialing means having means thereon for actuating said contact device to an extreme position out of engagement with said dialing means, and means for latching said contact device in said extreme position whereby central will be dialed but once, and means for producing a signal over said telephone circuit after central has been dialed.

2. In a device of the character indicated, a telephone circuit, a motor having a shaft, thermostatic means for starting said motor, a pair of disks operated by said motor shaft, said disks being insulated from said shaft and from each other, contact means actuated by one of said disks for affecting said telephone circuit to call central and contact means actuated by the other of said disks for affecting said telephone circuit to transmit a signal over said telephone circuit, said disks being arranged to cause central to be called first and thereafter signaled.

3. In a device of the character indicated, a normally open telephone circuit, a second circuit in parallel therewith, thermostatic means for normally maintaining said second circuit open, a

pair of contact devices and a magnetic coil in series with one of said circuits, an armature for said magnetic coil, a clockwork having an escapement and balance means, said armature being positioned to normally hold said escapement and balance means to prevent operation of said clockwork until said second circuit is closed, whereupon said coil will be energized to move said armature to release said escapement and balance means and start said clockwork, a dialing disk actuated by said clockwork and operable to move one of said contact devices for dialing central, a signal disk also actuated by said clockwork and positioned to actuate said other contact device for affecting said telephone circuit to transmit a signal after central has been dialed.

HAYWARD R. ALKER.