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1,685,853

A. S. MAZZUR

SIGNAL SYSTEM

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Fig. 1

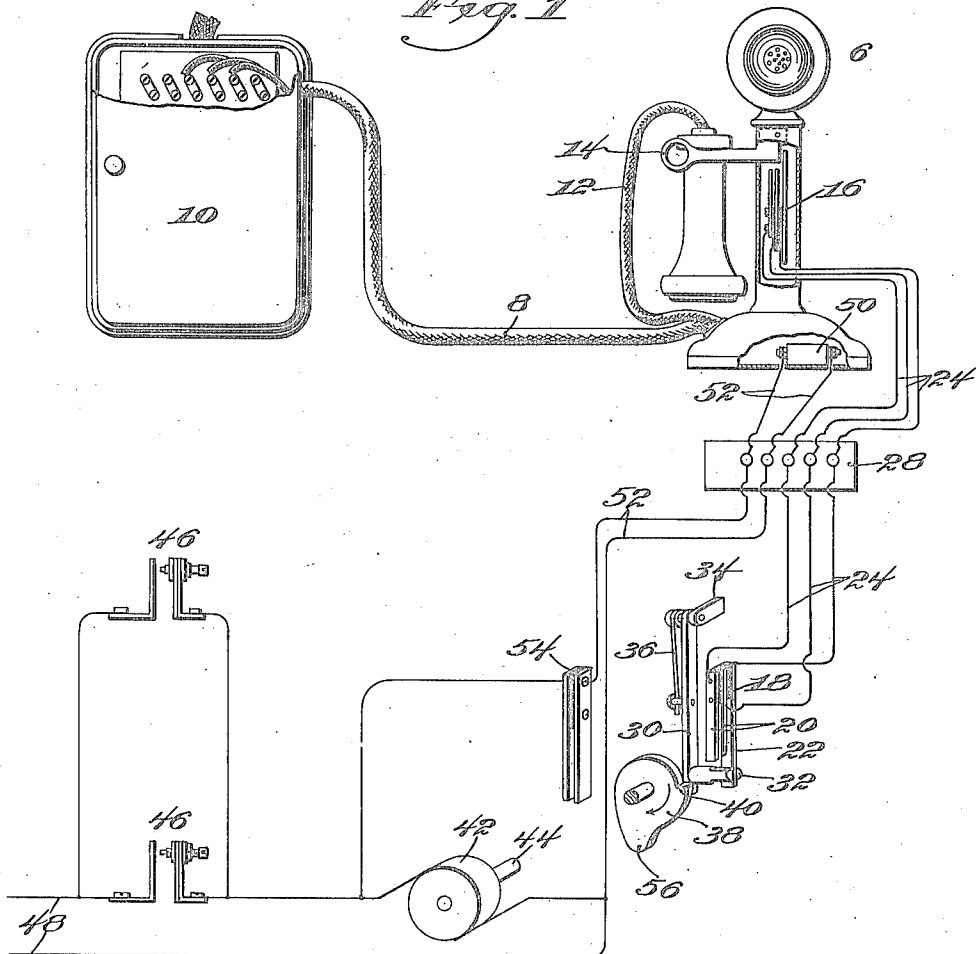
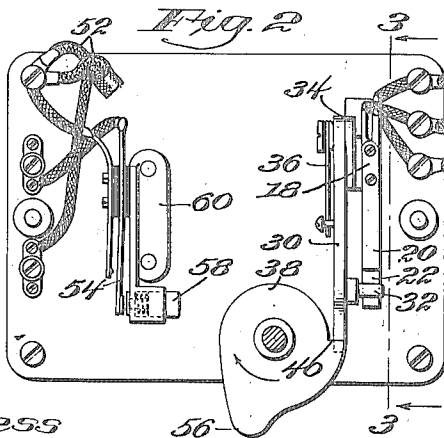
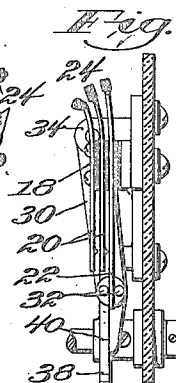
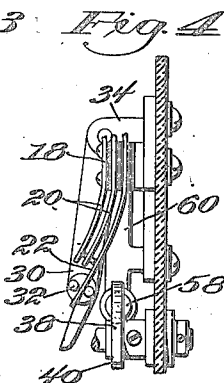


Fig. 2

Fig. 3

Fig. 4



Witness
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UNITED STATES PATENT OFFICE.

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SIGNAL SYSTEM.

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The present invention relates to fire alarm systems and more particularly to automatic systems adapted to be associated with the usual telephone circuits for giving an alarm upon occurrence of fire.

The object of the present invention is to provide a fire alarm system to be associated with a telephone system without alteration of existing telephone circuits or interference with normal use of the instrument, and arranged automatically to transmit a signal over the telephone lines upon excessive generation of heat in the vicinity of a predetermined point or points within a building.

With this object in view, the principal features of the invention contemplates the provision of means external to the telephone instrument adapted to close the telephone circuit to connect the instrument to the line independently of the usual hook controlled switch. This external means is associated with one or more heat responsive devices which act upon occurrence of an abnormal rise in temperature to afford connection of the instrument to the usual telephone lines. Simultaneously a signal device which is adapted to give an audible signal at the central switch board is set into operation and continues until the apparatus is reset. In the simplest and most efficient form of the invention yet devised the external circuit closing means consists of a three element switch similar to the hook controlled switch and which is normally maintained in open position until closed by operation of a heat responsive device. The external switch neither interferes with or is affected by normal use of the telephone instrument for purposes of conversation.

Other features of the invention consist in certain novel features of construction, combinations and arrangements of parts hereinafter described and particularly defined in the claims.

In the accompanying drawings, Fig. 1 is a circuit diagram of a fire alarm apparatus embodying the features of the present invention; Fig. 2 is a detail view of the circuit closing switch and signal control means; Fig. 3 is a section on line 3—3 of Fig. 2; and Fig. 4 is a view similar to Fig. 3 showing the switch in closed position.

In the illustrated embodiment of the present invention a three element switch similar to the hook controlled switch of the telephone instrument is arranged externally of the in-

strument and is adapted to have its separate elements connected to corresponding elements of the hook controlled switch. The external switch is normally maintained in open position by a cam which upon operation through the intervention of the heat responsive devices serves to release the external switch to close the telephone circuit and to connect the instrument to the line in a manner similar to the connection when the hook controlled switch is operated by removal of the receiver. The operation of one of the heat responsive devices also closes an audible signal circuit which includes a buzzer associated with the telephone instrument, the buzzer being operated either continuously or intermittently according to a predetermined code by means of a switch actuated by the release cam.

Referring to the drawings, a telephone instrument indicated generally at 6 is connected by a cord 8 with the usual box 10. A cord 12 connects with the receiver of the instrument which serves to hold depressed the hook 14, thus maintaining the three element switch 16 of the instrument in normally open position. The usual connections from the switch to the transmitter and receiver of the instrument are not shown in the drawings in order to avoid complications in detail. The fire alarm apparatus consists of a three element switch 18 having two short contact members 20 and a relatively long contact member 22, the construction of the switch being similar to that of the switch 16. Corresponding elements of the switches are electrically connected together by wires 24 which connect to a suitable terminal block 28 arranged in any convenient location. The switch is maintained in open position by a release arm 30 which has a split pin 32 engaging with the long contact arm 22 and which is pivoted at one end upon a support 34. The release arm is normally urged in a direction to close the switch by a torsion spring 36 which is maintained in depressed position by a cam 38. The release arm bears against the under side of the cam 38 which has a shoulder portion 40 arranged to permit a closing movement of the release arm upon rotation of the cam in the direction of the arrow. Upon occurrence of fire, a motor 42 which is connected by a shaft 44 and any suitable reducing gearing with the cam 38 is operated by one or more of a plurality of alarm initiating devices, indicated as thermostats 46 which are arranged in parallel

with each other and in series with an electrical source of supply indicated by the supply lines 48. The thermostats may be of the usual bimetallic construction arranged to flex and close an electrical contact upon generation of sufficient heat thereby closing the motor circuit and operating to rotate the cam 38. The rotation of the cam permits rising of the release 30 to the position shown in Fig. 4 which is entirely above the cam and the release bar is, therefore, thereafter unaffected by the rotation of the cam, thereby maintaining the telephone circuit closed until the apparatus is reset.

The rotation of the cam 38 is also utilized to operate an audible signal device which is associated with the telephone instrument. The signal device consists of a buzzer 50 placed within the base of the instrument and connected by wires 52 through the terminal block 28 to opposite sides of the motor in order that the buzzer circuit may be energized simultaneously with the starting of the motor. The buzzer circuit includes a two contact switch 54 which is closed intermittently by the cam wheel 38. To this end the cam is formed with a projection 56 which engages intermittently with a spring pressed plunger 58 bearing against one of the contacts and mounted in a suitable support 60. The cam may be formed with one or more projections of any desired length in order that a suitable code signal may be generated in such a manner that the operator may properly distinguish the location of the instrument if the latter is on a party line.

Under normal conditions the switch 18 is maintained open and has no effect upon the operation of the telephone circuit. Upon occurrence of fire which results in closing of one or more of the thermostats the motor circuit is closed, thus rotating the cam in the direction of the arrow and closing the switch 18. This rotation of the cam also operates the buzzer circuit. The buzzer by its position in the base of the instrument serves to vibrate the carbon granules of the transmitter as effectively as if it were placed directly in front of the instrument. Upon responding to the call set up by the closing of the switch 18 the operator hears the generated code signal transmitted by virtue of the operation of the buzzer 50. The rotation of the cam continues until all of the thermostats resume normal open position. After the alarm is answered, the switch 18 may be manually reset by depressing the release arm 30 and permitting the cam wheel to rotate to the position shown in Fig. 2.

In practice, the thermostats 46 will be located in the parts of the building which will be most susceptible to excessive generation of heat in order that operation of the system may be initiated immediately upon the occurrence of a fire. In the actual construction

of the apparatus the wires 24 and 52 leading from the telephone instrument to the terminal block 28 will be bundled in a single cord passing through an opening in the base of the instrument. The block 28, as well as other parts of the fire alarm apparatus, may be located in any convenient position, but in order to avoid a multiplicity of cords leading from the telephone it may be desirable to place the terminal block 28 within the box 10 in which case the wires 24 and 52, as well as those ordinarily included in the cord 8, may be bundled together in a single cord of larger diameter. In this latter construction, the wires leading from the terminal block to the external circuit closing switch 18 and the buzzer control switch 54 will lead directly from the box where they will in no way interfere or become entangled with the telephone instrument.

It will be seen that normal use of the instrument for conversation purposes and the operation of the alarm are practically independent of each other. The alarm system is always maintained in readiness for operation, and requires no settling or adjustment after its installation. Moreover, the alarm, when once initiated upon occurrence of a fire, operates until either the circuit is rendered inoperative by the fire or the switch is manually reset, thus assuring that the signal can not escape the attention of the central operator.

Having described the invention, what is claimed is:

1. An alarm apparatus comprising alarm initiating means, a normally stationary code wheel, means acting upon operation of the alarm initiating means for continuously rotating the code wheel, a signal circuit, a switch operated by the code wheel for intermittently opening and closing the signal circuit, a multiple element switch adapted to have its separate elements connected to the corresponding elements of the hook switch of a telephone instrument, a release cooperating with the multiple element switch and normally engaging the code wheel to maintain the elements of the switch out of contact with each other and constructed and arranged to be released and to permit permanent engagement of the contacts after starting of rotation of the code wheel.

2. An alarm apparatus comprising alarm initiating means, a motor, connections between the motor and the alarm initiating means to rotate the motor upon actuation of the alarm initiating means, a code wheel connected with the motor, a signal circuit, a switch in the signal circuit constructed and arranged to be operated by the code wheel to intermittently open and close the signal circuit, a multiple element switch adapted to have its separate elements connected with the corresponding elements of the hook switch

of a telephone instrument, a release arm normally holding the elements of the switch out of contact with each other and having one end engaging a face of the code wheel, the code wheel having a shoulder against which the release arm normally engages, and a spring acting on the release arm to permit closing of the multiple element switch when the shoulder on the code wheel passes the end of the release arm on starting of rotation of the code wheel. 10

In testimony whereof I have signed my name to this specification.

AMEDEE S. MAZZUR.