

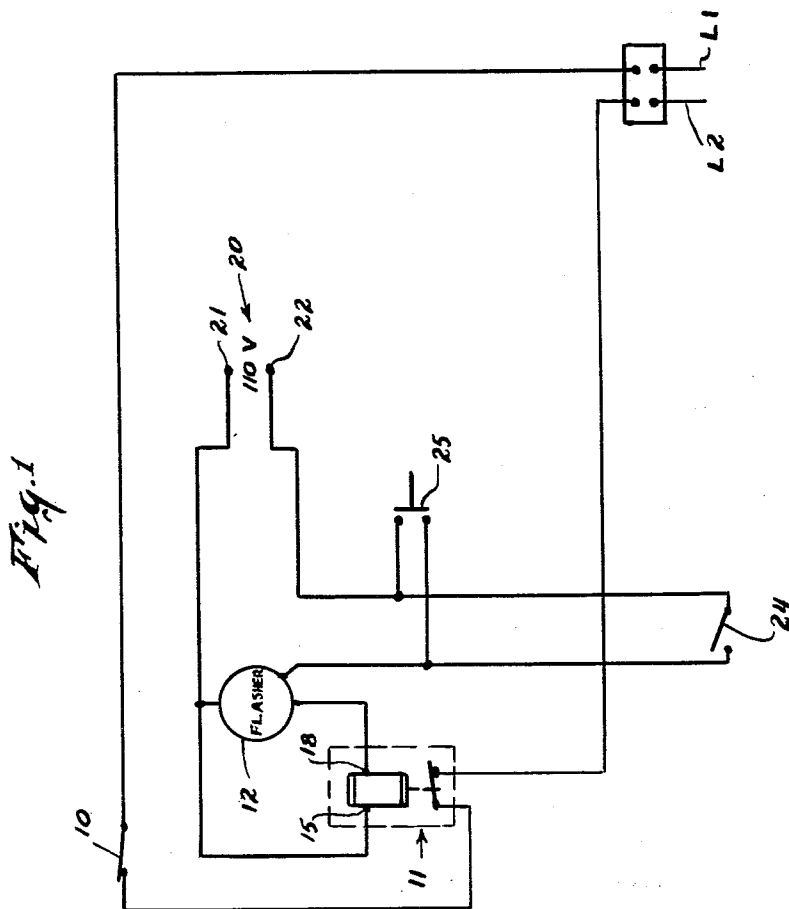
Sept. 22, 1964

P. J. HOEY
REMOTE ALARM INDICATOR

3,150,359

Filed June 23, 1961

2 Sheets-Sheet 1



INVENTOR.
PETER J. HOEY
BY *Klenberg & Lellis*
ATTORNEYS

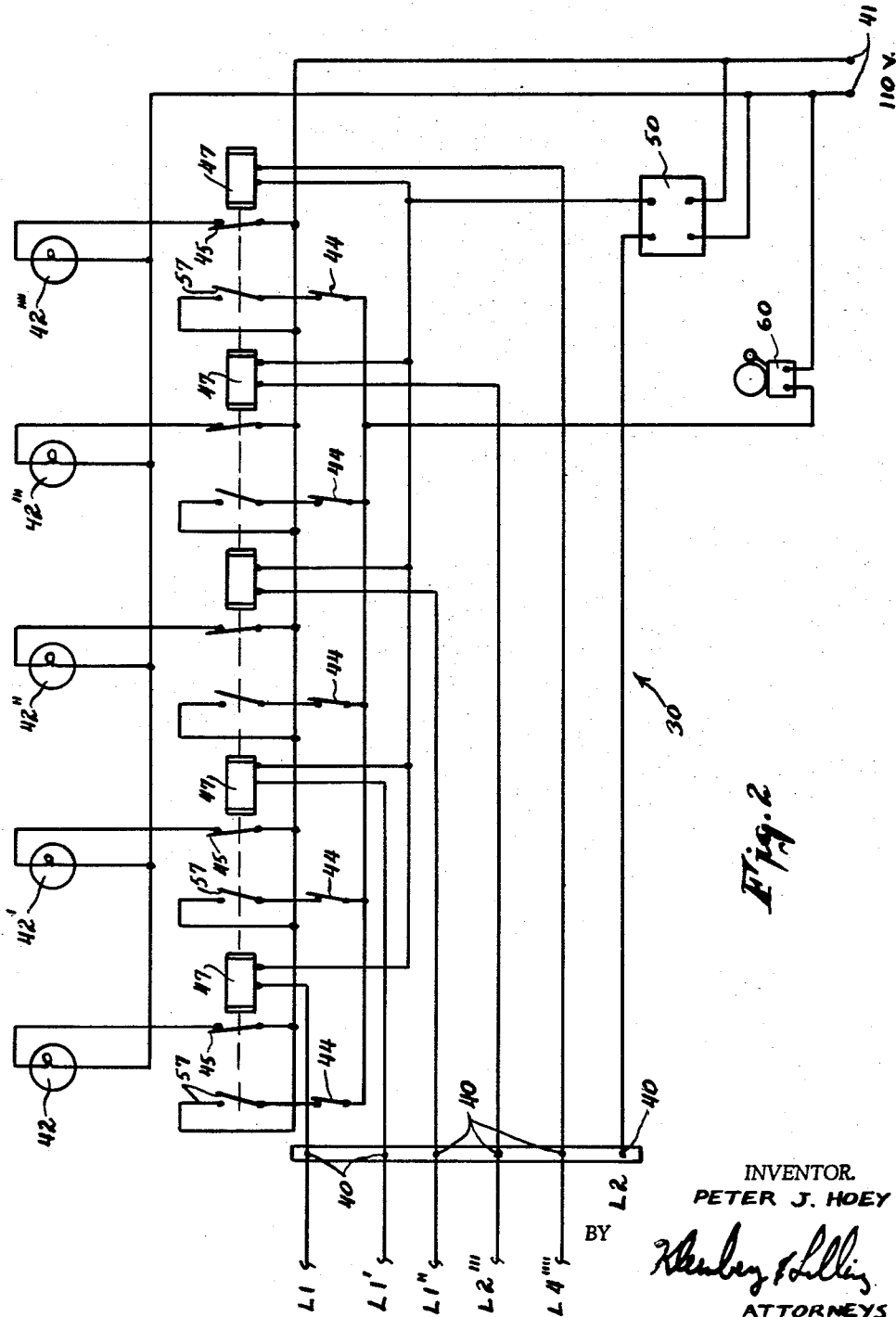
Sept. 22, 1964

P. J. HOEY
REMOTE ALARM INDICATOR

3,150,359

Filed June 23, 1961

2 Sheets-Sheet 2



INVENTOR.
PETER J. HOEY

BY

Shenley & Lillis
ATTORNEYS

1

3,150,359

REMOTE ALARM INDICATOR

Peter J. Hoey, 58—01 Woodside Ave., Woodside, N.Y.

Filed June 23, 1961, Ser. No. 119,228

1 Claim. (Cl. 340—213)

The invention here presented is broadly in the electrical signaling art; more specifically it presents a central station combination alarm system; and in detail it is concerned with an improved remote alarm device.

This signaling device is designed primarily for use in conjunction with hot water boilers, heating systems and industrial or commercial boilers. It should be realized, however, that it is contemplated that it is equally applicable to almost any remote type signaling system, such as commonly utilized as fire alarms, smoke control detectors, etc.

A constructed embodiment of this device is currently utilized to indicate the oil level and operation of the oil burners in a wide area. Thus, an operator, by checking one central station, can determine if any of the oil storage tanks connected to the system are low in oil and which of the oil burners are presently not functioning.

There are many and varied central alarm systems available. In general, however, the conventional systems are complicated, relatively expensive, and inefficient. Additionally, they fail to accomplish the most important function of any such system, i.e. reliability with minimum of maintenance. As is well known, an alarm system that is inoperative is inferior to no system at all.

In view of the above, it is generally mandatory in such devices to provide a supervisory circuit to constantly insure the integrity and operativeness of the system by warning of any faults. As is realized, this contributes to the relatively high cost of the commercially available units.

Furthermore, the existing units are of necessity complicated in that relatively expensive and cumbersome equipment must be utilized in order to accurately ascertain the exact location of the alarm when sensed. The only alternative to the above is to connect a separate electrical line from each of the alarm stations to the central control panel. This will obviously be expensive, unreliable and wasteful.

Furthermore, the present systems are generally designed to indicate but one type of alarm, i.e. fire, etc. There are few systems which are able to simultaneously indicate more than one type of alarm or malfunction.

The cardinal object of this invention, therefore, is to provide a remote alarm device which is simple and efficient.

Another primary object hereof is to set forth an alarm circuit that has a high degree of reliability.

Another object of this device is to set forth a unit as above-described whereby any inoperativeness of the alarm circuit will be immediately apparent.

A still further purpose of the instant invention is to set forth an alarm circuit which will indicate the level of fluid in the tank and/or the operativeness of a boiler at a central station.

Another object hereof is to set forth a single circuit serving many alarm stations wherein an operator at a central station can determine which of the detectors indicates an alarm.

Another purpose hereof is to set forth a circuit and device as abovedescribed that has relatively few working parts.

With these objects in view, the invention consists of the novel features of construction and arrangement of parts which will appear in the following specification and recited in the appended claims, reference being had to the

2

accompanying drawings in which the same reference numerals indicate the same parts throughout the various figures and in which:

FIG. 1 is a diagrammatic view of a typical detection circuit as contemplated for use in conjunction with this invention.

FIG. 2 is a primarily diagrammatic view of the electrical components of a typical central station circuit.

It will be realized that the illustrations have been simplified to the greatest possible extent for the purpose of clarity of understanding of the present invention. The drawing is diagrammatic and conventional symbols have been utilized wherever possible.

Referring particularly to FIG. 1 of the drawing, there is shown a typical alarm detection circuit. It should be noted that although only one detection circuit is herein illustrated, a system will generally comprise many such circuits. The feasibility of such a construction will become evident hereinafter.

Furthermore, many such individual lines each incorporating a plurality of detection circuits may be connectable to one central alarm station.

Again referring to FIG. 1, there is shown an alarm detector 10 to sense a desired emergency condition. As previously mentioned, the detector 10 may be of the heat sensing type, pressure sensing type, etc. Although the detector 10 should be of the normally closed type, opening only upon the sensing of the emergency condition, it is not otherwise described, since its specific form plays no part in the present invention.

It will be seen that the detector 10 is connected across the transmission lines L1 and L2. Thus, there will be a constant flow of current across the lines L1 and L2 so long as there is no break in the system and the detector 10 does not indicate an alarm.

Still referring to FIG. 1, it will be seen that a normally closed relay 11 will be suitably connected in the above-mentioned portion of the detection circuit. Thus, any opening of the normally closed relay 11 will also serve to cause the break of current across transmission lines L1 and L2.

Referring again to FIG. 1, there is shown a second integral alarm circuit; the said second circuit containing a flashing unit 12. The second alarm circuit may have a separate power supply indicated generally at 20. One of the terminals 21 of the said power supply 20 will be electrically connected to one terminal 15 of normally closed relay 11. The other terminal 22 of the power supply 20 will be electrically connected to the other terminal 18 of the normally closed relay 11 through a normally open second detecting device 24 and a flasher unit 12.

Thus, the operation of this portion of this embodiment of the invention is apparent. Should there be a failure in any of the transmission lines L1 or L2 or an opening of the normally closed detection unit, there will be a complete break in the flow of current from L1 to L2. This will be sensed at the central station as will be hereinafter explained in detail. Furthermore, the second detection unit 24 upon indicating an alarm will close, thereby completing a circuit across the separate power supply 20 and the relay 11 through an intermittent flasher unit 12. Normally closed relay 11 is constructed so that when power is supplied to terminals 15 and 18, the relay 11 will open. Thus, as flasher unit 12 operates, it will intermittently supply current to terminals 15 and 18 thereby causing relay 11 to intermittently open and close according to a predetermined schedule. This will further cause an intermittent but predetermined flow of current between transmission lines L1 and L2.

Of course it will not be apparent that any number of secondary detectors 24 may be connected across the re-

3

lay 11. It will merely be necessary for each of the secondary detectors 24 to contain its own timed flasher unit 12.

Thus, it will be seen that if there should be a complete stoppage of flow of current across transmission lines L1 and L2, it will be an indication that the primary detector 10 has opened, indicating an alarm or one of the lines has failed. If, however, there should be an intermittent stoppage of the flow of current between transmission lines L1 and L2, it will only be necessary to time the frequency of the intermittent stoppage, to determine exactly which of the secondary detectors 24 is indicating an alarm.

It will further be observed that one or more test buttons 25 may be suitably connected across the circuits for the purpose of checking their operation conveniently at predetermined intervals.

Now referring particularly to FIG. 2, it will be remembered that many of the circuits as above-described will be connected to a central indicating station 30. Each of the pair of lines L1 and L2 will have one primary detector 10 but may have many secondary detectors 24. As an example of the usefulness of such an indicating combination, it should be realized that in a typical oil burner heating system, the primary detector 10 will indicate the operativeness of the burner itself while the plurality of secondary detectors 24 may be utilized to determine if the level in any of the oil storage tanks has fallen below a pre-set amount.

The transmission lines L1 and L2 from the plurality of detectors 10 and 24 may be connected to the terminals 40 of the central indicating station 30 by utilizing telephoned transmission lines (class III) or by separate transmission lines installed for this purpose.

Referring again particularly to FIG. 2, the central indicating station 30 will be supplied with normal voltage power at terminals 41. One indicating lamp 42 will be provided in the circuit for each of the series of transmission lines from the detectors. As will be seen, each of the indicating lamps 42 will receive current from the power supply 41 through a normally closed relay switch 45. While the said relay and switch remain closed, the lamps 42 will remain burning. To reduce malfunction and reduce maintenance the signal lamps 42 may be of the neon type or in the alternative may consist of two separate lamps in series so that if one burns out the other will remain lit.

Tapped from the main power supply source 41 or from a separate supply source will be a secondary supply source 50 for the current sent out through the transmission lines L1, L2, etc. to each of the detector stations. A complete circuit will be formed through each of the transmission lines through the detector stations and back through each of the normally closed relay switches 45. This return flow of current through each of the transmission lines serves to maintain the relay switch 45 closed as by a coil 47. The relay switch 45 will normally be of the low or milli-ampere type so that any power loss in the transmission lines will not cause the said relay to open.

Should there be a malfunction in any portion of the detecting system or a breaking of current by any of the detectors as previously explained, the current will cease flowing through one of the transmission lines. This in turn will cause the normally closed relay switch 45 connected to the said transmission line to open by ceasing the flow of current to coil 47.

In that the signal lamps 42 are each connected to their power supply through the normally closed relay switch 45, the electrical supply to the signal lamp 42 will cease simultaneously with the opening of the said relay.

Thus, when any of the signal lamps 42 go out, it will be an indication that one of the detectors connected to the transmission line emanating from that signal lamp has indicated an alarm condition. If the lamp remains out it indicates that the primary detector 10 has tripped. If the signal lamp 42 flashes on and off it will be a sure in-

4

dication that one of the secondary detectors is indicating the alarm. If there are a plurality of secondary detectors 24 connected through any one transmission line, the exact detector may be ascertained at the central control station merely by timing the flashing interval of the signal lamp 42. This is in that as previously explained, each of the secondary detectors 24 is connected through a predetermined timed flasher 12.

It will be seen that the circuits described above will operate to accomplish all of the objects previously set forth.

In order to further call attention to any alarm condition, one or more alarm bells or horns may be connected thereto. As seen in FIG. 2, a single bell 60 may be connected from one terminal of the power supply 41 through a normally opened relay switch 57 to the other terminal of the power supply 41. Thus, if relay switch 57 changes position due to a failure of current returning from the transmission line, that portion of the relay will close causing the bell or horn 60 to call attention to the alarm. In order that the alarm 60 does not continue until such time as current is restored in the transmission line, a normally closed manual switch 44 may be provided in the circuit. Thus, the operator after noting the alarm will open switch 44 discontinuing the flow through the bell or horn circuit. The appropriate signal lamp 42 will, however remain out until the alarm condition is removed.

As hereinbefore observed, the diagram and the circuit set forth has been simplified for the purpose of clarity of invention. Commercial circuits will without doubt be additionally complicated by conventional protective devices and other appurtenances.

Still further, if extensive use of the system is realized, one central station may be situated without an operator in each neighborhood. Each of said central stations will be in turn connected to one master station serving an entire area. Thus, if there should be an alarm sensed in any one central station, the master station will indicate the alarm but not the particular detecting station or the cause. A serviceman may then be dispatched to the central station where he will record the alarm and tend to its elimination.

It should especially be noted that the system as above-described may be used for any remote signaling purpose or combination of purposes. The applications of the circuit are unlimited. As an example, it should be noted that one contemplated immediate use thereof is to indicate the level of gasoline or other fuel in storage tanks for service stations located throughout the entire city or other large area.

While there are above disclosed but a limited number of embodiments of the structure and product of the invention herein presented, it is possible to produce still other embodiments without departing from the inventive concept herein disclosed, and it is desired, therefore, that only such limitations be opposed on the appended claims as are stated therein or required by the prior art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

An alarm detection and signal system for a plurality of alarm conditions, including, a plurality of detection circuits, each detection circuit including a first alarm detector being of the normally closed type and being open only when an alarm condition is sensed, each of said first alarm detectors being electrically connected to a common central signal panel through a transmission line, each of said transmission lines including at least one normally closed relay, each of said detection circuits including a second alarm detector being of the normally open type and being electrically connected to said relay whereby when any of said second detectors sense an alarm it will close thereby opening said relay thereby breaking said electrical connection through said transmission lines and

a separate flashing timer electrically connected between each of said relays and said second detectors whereby said relay will be intermittently activated when said second detector is activated, each of said transmission lines being connected to a lamp at said central signal panel whereby a separate lamp will be deactivated should electrical current cease through any one of said transmission lines. 5

References Cited in the file of this patent

UNITED STATES PATENTS

1,452,500	Galerman	Apr. 24, 1923
1,738,299	Kille	Dec. 3, 1929
2,971,186	Ripepi	Feb. 7, 1961
3,036,297	Simjian	May 22, 1962