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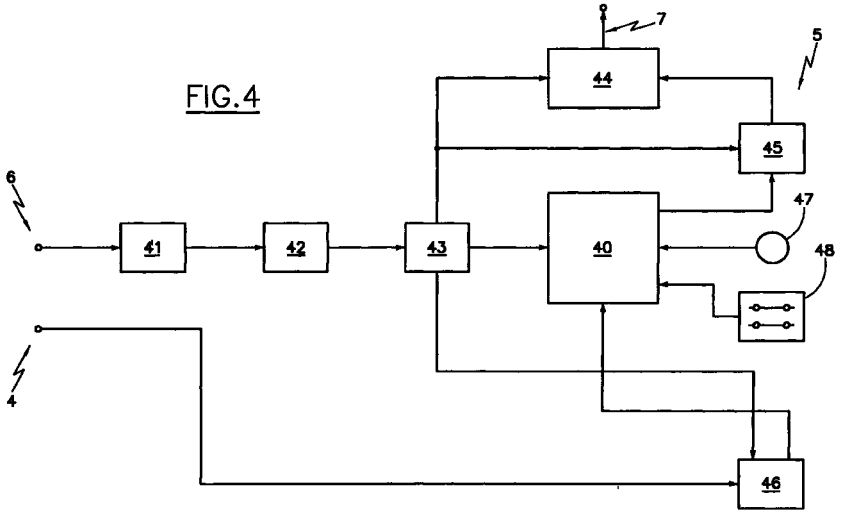
(54) Perimeter alarm actuating module, particularly for a system of winding devices

(57) An actuating module (5) for perimeter alarm system is described, in particular a system comprising one or more winding devices (1), each one with a push-button panel (2) that is connected with the other ones by means of a centralisation connection line (4), in such a way that during an attempt of intrusion one or more of the winding devices (1) send on the line (4) a digital signal, which identifies a state of perimeter alarm and is suitable to activate first alarm mechanisms (27) that are provided in said winding devices (1). The aforesaid actuating module is connected to the line (4), in such a way that, when the perimeter alarm state identifying signal gets in, it activates second alarm mechanisms external to the perimeter alarm system.

FIG.4



EP 0 969 436 A2

Description

[0001] The present invention refers to a perimeter alarm device, in particular for the management of a digital signal of perimeter alarm that is present in the line connection of one or more motors for operation of winding devices, such as roller shutters, roller gates, blinders and similar.

[0002] In the last few years the custom to use electric controls for the opening and closing movements of roller shutters, in particular of the metallic ones, more resistant to force opening but also much heavier than the wooden or plastic ones, has been increasingly spreading.

[0003] A reversible tubular electric ratiomotor having proper power and speed is therefore applied inside the rotating drum onto which the shutter is wound and an electric control of the movement is utilised, that is realised by inserting an optical encoder in the winding drum which generates impulses at each prefixed angle of rotation of the drum and also by providing a push-button control panel provided with memory, that, by collecting and counting the impulses that are transmitted by the encoder, allows at first to memorise desirable limit stop positions and then to control in a repetitive way the opening and closing movements of the roller shutter up to the aforesaid limit stop positions.

[0004] Possible positioning errors at the end of the opening or closing movement, due to the inevitable inertia of the roller shutter at the end of the movement and to the possibility of a settling re-descent, can be automatically compensated by means of electronic control systems for roller shutters, as described for example in EP-A-0671676.

[0005] Each push-button panel associated with the given tubular ratiomotor contains a microprocessor that has the task to "dialog" with a microprocessor contained inside the ratiomotor and, in case of a centralisation connection, also with the microprocessors of the other connected push-button panels.

[0006] Each push-button panel relative to each winding device can be programmed through appropriate push-buttons provided on the same push-button panel, so as to realise hierarchies within a centralisation and therefore to have the possibility to perform determined functions starting from each push-button panel of the same. In addition it is possible to realise an automatic operation programme over the week, possibly visualisable through a liquid crystal display.

[0007] Among the multiple elements that are controlled and operated by the microprocessors of each winding device (tubular ratiomotor and relative push-button panel) one concerns the detection of a state which identifies in an univocal way an attempt of intrusion from the outside through a regularly lowered roller shutter.

[0008] During such force opening attempt, the microprocessor contained inside the ratiomotor detects a movement of the disc of the optical encoder due to the thrust on the roller shutter, and simultaneously it also detects the absence of the corresponding operation control (for example operation on the push-buttons of the control panel).

[0009] The aforesaid condition consequent on the intrusion in progress is managed by the relevant ratiomotor in such a way as to send a corresponding digital code to the microprocessor of the corresponding push-button panel and therefore to all the microprocessors of all the push-button panels that are connected in line.

[0010] The typical perimeter alarm signal is therefore present on the entire connection line of the push-button control panels and it is therefore visualised by means of the lighting of appropriate light indicators (for example LED) present on them or, as an alternative, by means of a full writing on possible displays.

[0011] Starting from the moment in which the perimeter alarm has been activated, the on-line signalling lasts for a determined period (for example sixty seconds) after which it automatically stops and the winding devices go back to a condition of regular operation, with the exception of the winding device directly concerned with the alarm, which continues to visualise such state and remains continuously not operable until an appropriate reset button that is provided on its push-button control panel is pressed.

[0012] Particularly useful would appear the possibility to bring the perimeter alarm signal outside of the winding device operating system, in order to be able to activate other mechanisms external to that circuit, as sirens, flashing lamps, pre-existing alarm systems of different nature for the coverage of the same area, or telephone modems to transmit such signal to pre-established users.

[0013] In view of the described state of the art, object of the present invention is to provide an actuating module for perimeter alarm capable to manage a possible alarm signal and as a consequence to activate mechanisms external to the perimeter alarm device.

[0014] According to the present invention, such object is attained by an actuating module for perimeter alarm system, in particular a system comprising one or more winding devices, each one with a push-button control panel that is connected with the other ones by means of a centralisation connection line, in such a way that during an attempt of intrusion, one or more of the winding devices send on the line a digital signal, that identifies a state of perimeter alarm and is suitable to activate first alarm mechanisms that are provided in the winding devices, the aforesaid actuating module being characterised in that it is connected to the line in such a way that, when the perimeter alarm state identifying signal gets in, it activates second alarm mechanisms external to the perimeter alarm system.

[0015] The characteristics and advantages of the present invention will become evident from the following detailed description of one of its embodiments, that is illustrated as a non limiting example in the enclosed

drawings, in which:

Figure 1 represents a control system for several winding devices provided with a perimeter alarm actuating module according to the present invention;

Figure 2 schematically shows a control system for the winding device, that is integrated in the operating ratiomotor of the roller shutter itself;

Figure 3 shows schematically a push-button panel of the system of Figure 2;

Figure 4 represents a block scheme of a perimeter alarm actuating module according to the present invention.

[0016] In Figure 1 there is shown a set of winding devices 1 connected with each other, each one comprising a tubular ratiomotor and a relative control system 8 (Fig. 2) integrated in the same ratiomotor, that are operated through connection lines 3 by respective push button panels 2, connected to each other through a serial type connection 4 (named "line").

[0017] The connection lines 3 comprise four telephone type small electric wires, while the line connection 4 between the various push button panels, that is used for a possible centralisation connection among the same, is done by means of three small telephone type electric wires between a push button control panel and the adjacent one.

[0018] At any point on the line 4 a perimeter alarm actuating module 5 according to the present invention is connected, which is supplied by the power mains through a connection 6, formed by two electric wires and requires the presence of two neutral contact double outlets 7.

[0019] In Figure 2 a block scheme of the winding device 1 is shown, more precisely of the ratiomotor 17 and of the control system 8 integrated therein. The system 8 includes a microprocessor 12 that receives information from a first decoder receiver 15, processes it and pilots, through a power device 13, the operation of the ratiomotor 17. The first decoder receiver 15 receives signals from the respective push button panel 2 through an electric wire 32, which is part of the connection line 3.

[0020] The movement of the ratiomotor 17 is read by an optical encoder 14 which sends such information to the microprocessor 12 in the way described in EP-A-0671676.

[0021] A transformer 9, connected with the power mains by means of a line 18, a rectifier 10 and a stabiliser 11, in cascade connection with each other, provide for a suitable power supply to the microprocessor 12, to the power device 13, to the first decoder receiver 15 and to a second decoder receiver 16, connected with the microprocessor 12 and serving the purpose to transmit signals to the respective push-button panel by means of an electric wire 31, comprised in the connection 3. A third electric wire 33, that is part of the connection 3, is utilised to provide for a continuous current supply to the elements making up the push-button control panel 2.

[0022] In Figure 3 a block scheme of the push-button panel for the control of the control system 8 and for the centralisation with other push-button panels is shown. By means of appropriate push-buttons that can be operated by the user and indicated by the two elements 25 and 26, it is possible to send signals to a microprocessor 20 which in addition receives signals from a third decoder receiver 22, connected by means of the electric wire 31 to the control system 8, and from a fourth decoder receiver 23, connected with line 4.

[0023] The microprocessor 20 in turn transmits information to a fifth decoder receiver 23, connected, by means of line 4, with other push-button control panels and to the actuating module 5, to a sixth decoder receiver 21, connected by means of the electric wire 32 to the control system 8, and in addition it is connected with a visualisation element 27, such as a liquid crystal display or a set of LED.

[0024] Through the electric wire 33 the two decoders receivers 21 and 22 and the microprocessor 20 are supplied.

[0025] In Figures 2 and 3, for greater exposition clarity, two small electric wires that are instead rendered in Figure 1 are not shown, and precisely one comprised in the connection 3 and one comprised in the connection 4, both utilised as reference lines.

[0026] In Figure 4 the block scheme of a perimeter alarm actuating module 5 according to the present invention is shown: there is a supply stage, consisting of a transformer 41, a rectifier 42 and a stabiliser 43 in cascade connection, which receiving in input, through the connection 6, the common power mains (for example 230V a.c. 50Hz), supplies with direct current (for example 5V d.c.) a microprocessor 40, a seventh decoder receiver 46, an amplifier 45 and a double electromechanical relay 44.

[0027] The decoder 46 identifies the possible digital signal of perimeter alarm present on the line 4 and sends a corresponding signal to the microprocessor 40, to which a reset button 47 and a set of two shunts 48 are also connected, which, when combined in a proper way, determine the operation mode of the actuating module 5. One of the two shunts, depending on whether it is closed or open, controls the alarm state at the output of the module 5, respectively by maintaining it active until the reset button 47 is pressed, or by interrupting it automatically after a period that is set through the other shunt; therefore, the latter, depending on whether it is closed or open, determines the time necessary for the state of alarm at the output 7 to stop automatically (such time periods corresponds, for example to 3 and 60 seconds).

[0028] The amplifier 45 receives a signal from the microprocessor 40 and activates the pair of electromechanical relays 44, which in turn activate their neutral

contact double output 7, each one of the two outputs being utilisable in a independent way from the other. Between the two outputs there is only a functional difference, that is during the alarm state of the actuating module 5, the contact of an output stays constantly closed while the one of the other one opens and closes at regular intervals with a determined rate (for example 1 second).

[0029] Summing up, the digital signal on the line 4, coming from one or more winding systems (winding device with relative push-button control panel) that are connected in a centralised way, gets to the decoder receiver 46, and if a signal of perimeter alarm consequent on an attempt of intrusion is present on the line 4, the decoder 46 identifies it as such and controls the microprocessor 40 in a corresponding way. The microprocessor 40, through the amplifier 45, activates therefore the two relays 44 according to the condition imposed by the two shunts 48 and by the reset button 47, and they in turn activate external devices that can be operated with neutral contacts, such as sirens, flashing lights or telephone modems.

[0030] Possible LED provided on the actuating module 5 can indicate the activation of the two contacts during the state of alarm in progress.

Claims

1. Actuating module (5) for perimeter alarm system, in particular a system comprising one or more winding devices (1), each one with a push-button panel (2) that is connected with the other ones by means of a centralisation connection line (4), in such a way that during an attempt of intrusion one or more of said winding devices (1) send on said line (4) a digital signal, which identifies a state of perimeter alarm and is suitable to activate first alarm mechanisms (27) that are provided in said winding devices (1), said actuating module being characterised in that it is connected to said line (4) in such a way that, when said perimeter alarm state identifying signal gets in, it activates second alarm mechanisms external to said perimeter alarm system.

2. Actuating module according to claim 1, characterised in that it comprises a pair of independent relays (44), whose contacts determine a neutral contact double output (7) to which said external second alarm mechanisms are connected.

3. Actuating module according to claim 2, characterised in that it comprises a decoder receiver (46) connected with said line (4) to receive said perimeter alarm state identifying digital signal, a microprocessor (40) that receives information from said decoder receiver (46) and activates said pair of relays (44) by means of an amplifier stage (45), a power stage (41, 42, 43) that supplies all the constituent components of said actuating module (5).

4. Actuating module according to claim 3, characterised in that said power stage (41, 42, 43) comprises a transformer (41), connected with a common power mains (6), a rectifier (42) and a stabiliser (43), all in cascade connection.

5. Actuating module according to any one of claims 3 or 4, characterised in that it comprises a set of shunts (48) and a reset button (47), suitable to provide for the operation conditions for said pair of relays (44).

6. Actuating module according to claim 5, characterised in that said set of shunts (48) comprises two shunts (48) that determine the duration of the alarm, in combination with the activation of said reset button (47).

7. Actuating module according to any one of the previous claims, characterised in that said centralisation connection line comprises three small telephone type electric wires, one of which is utilised as reference line.

8. Actuating module according to any one of the previous claims, characterised in that said second external alarm mechanisms can be activated with neutral contacts.

9. Actuating module according to any one of the previous claims, characterised in that said second external alarm mechanisms comprise sirens.

10. Actuating module according to any one of the previous claims, characterised in that said second external alarm mechanisms comprise flashing lamps.

11. Actuating module according to any one of the previous claims, characterised in that said second external alarm mechanisms comprise telephone modems for the calling of pre-defined users.

12. Actuating module according to any one of the previous claims, characterised in that said second external alarm mechanisms comprise alarm systems of different nature already existing for the coverage of the same area of said perimeter alarm system.

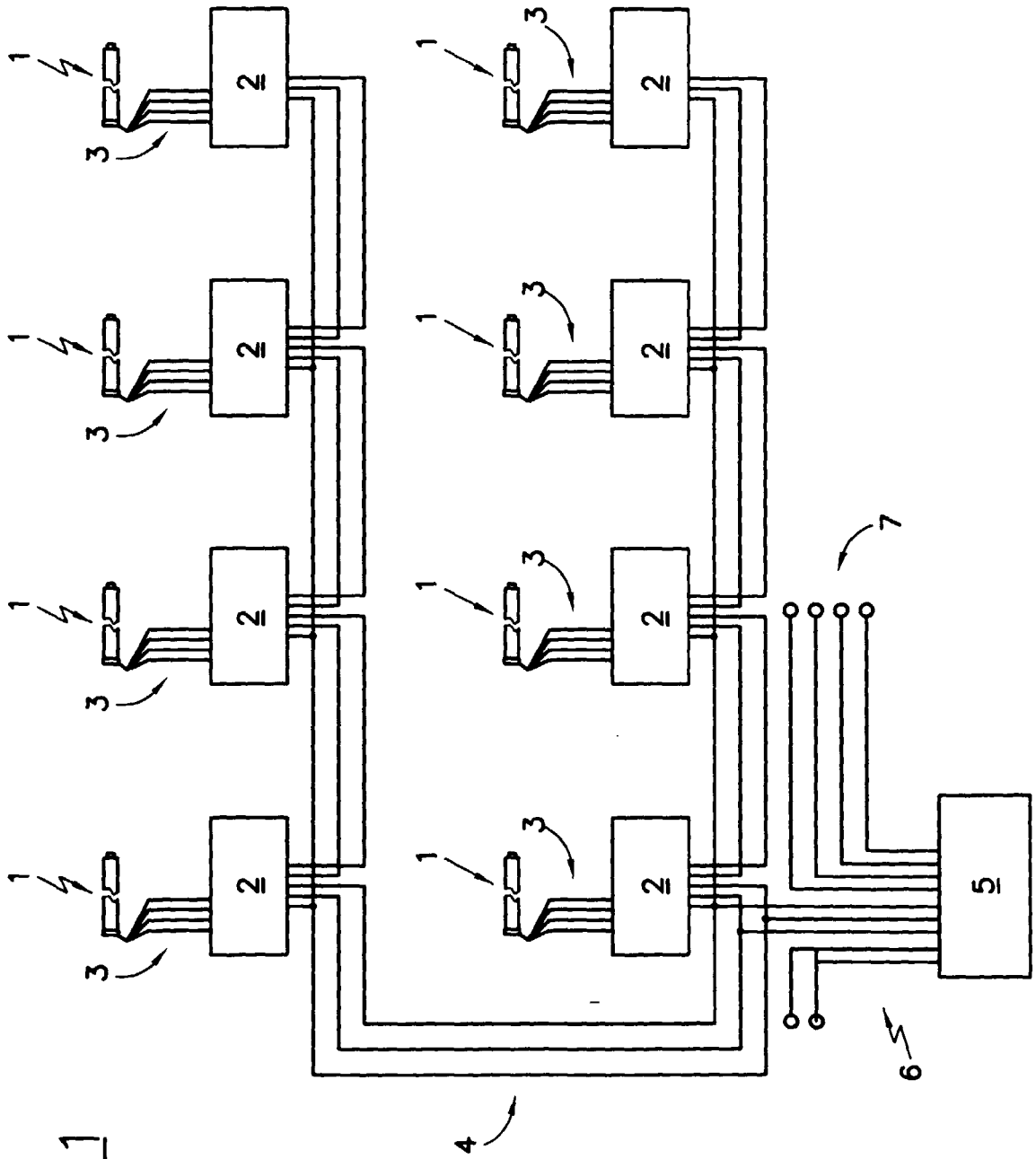


FIG.1

FIG.2

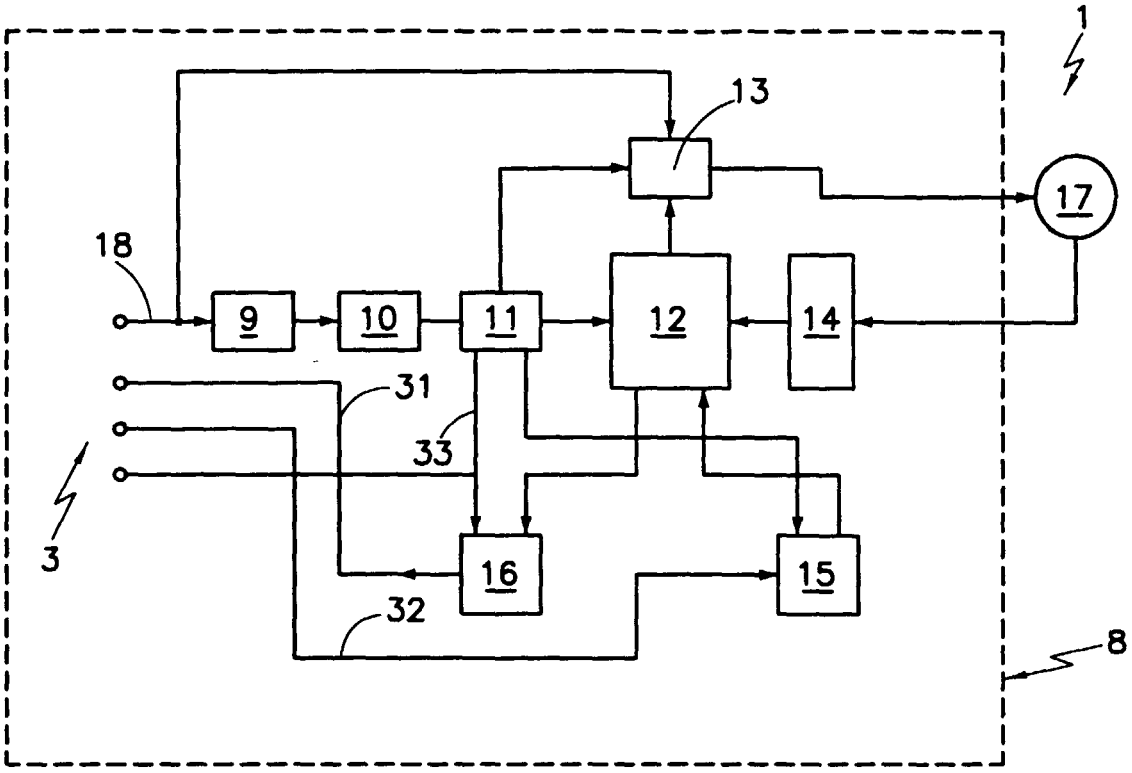

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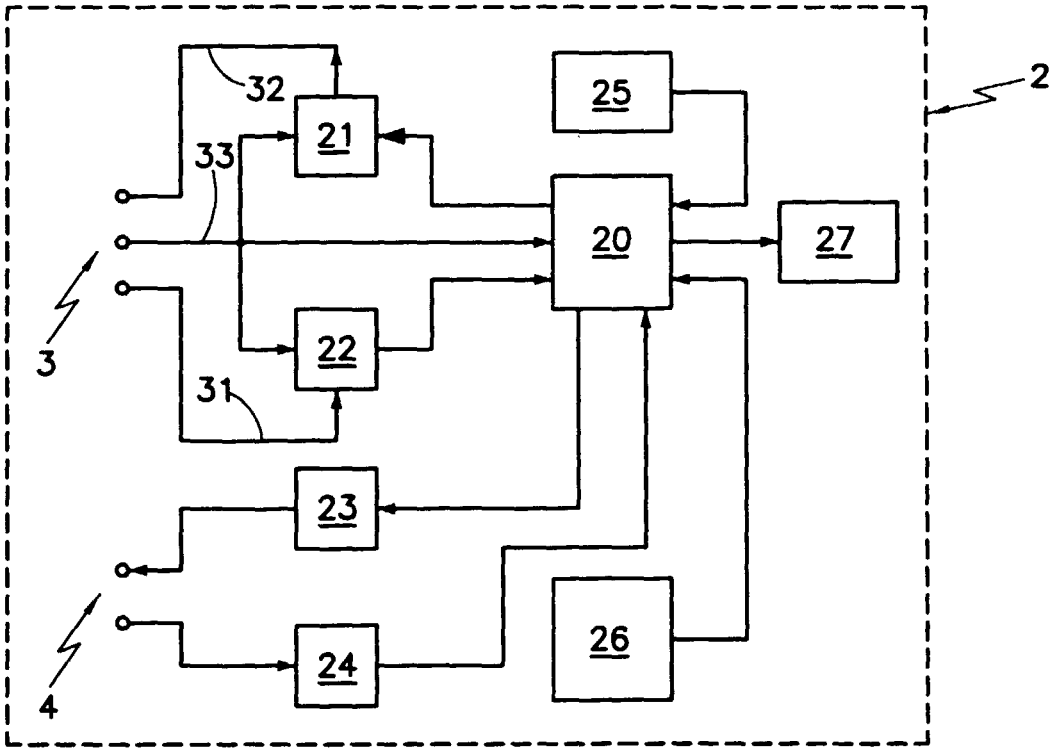
FIG.3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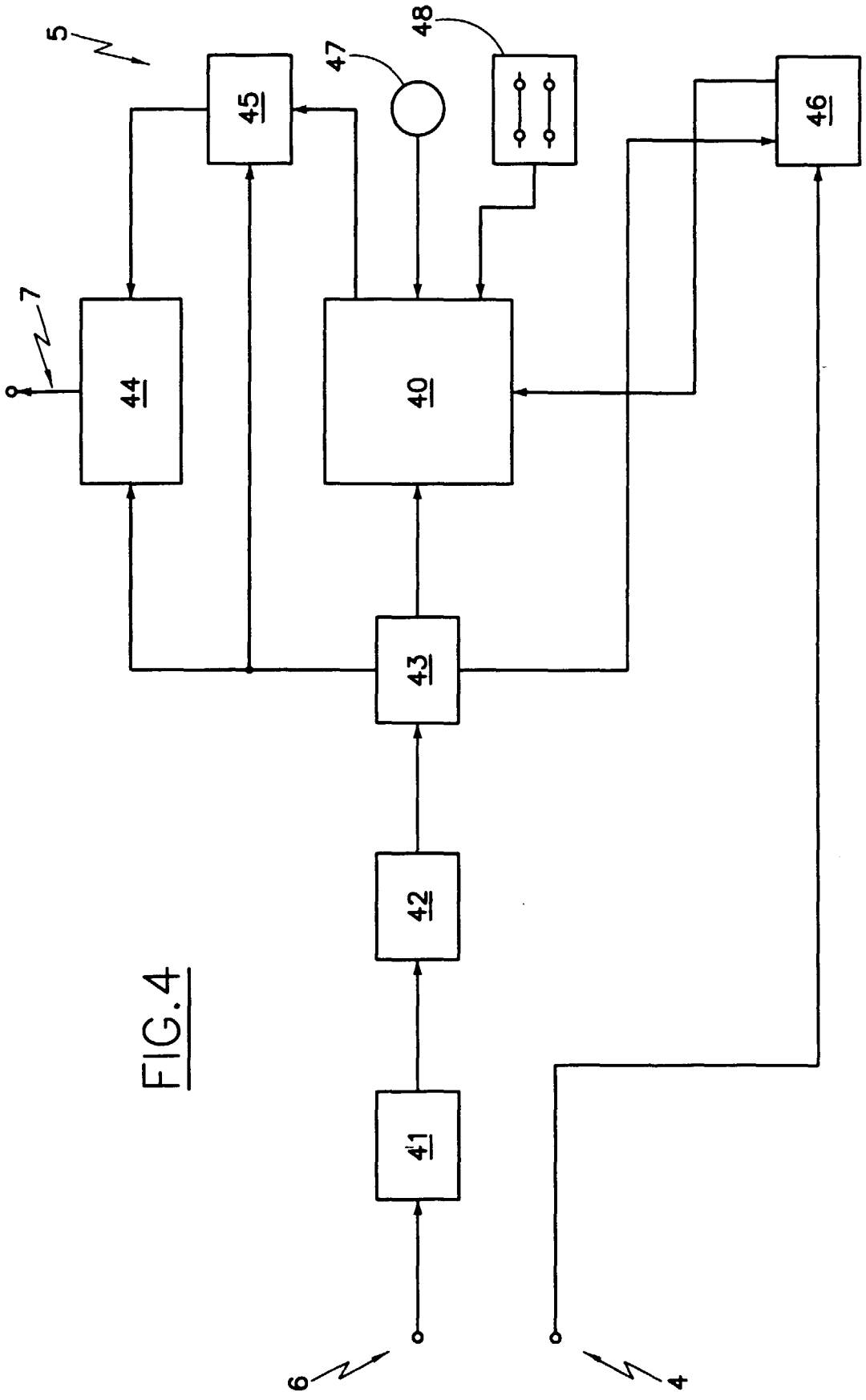

FIG.4