

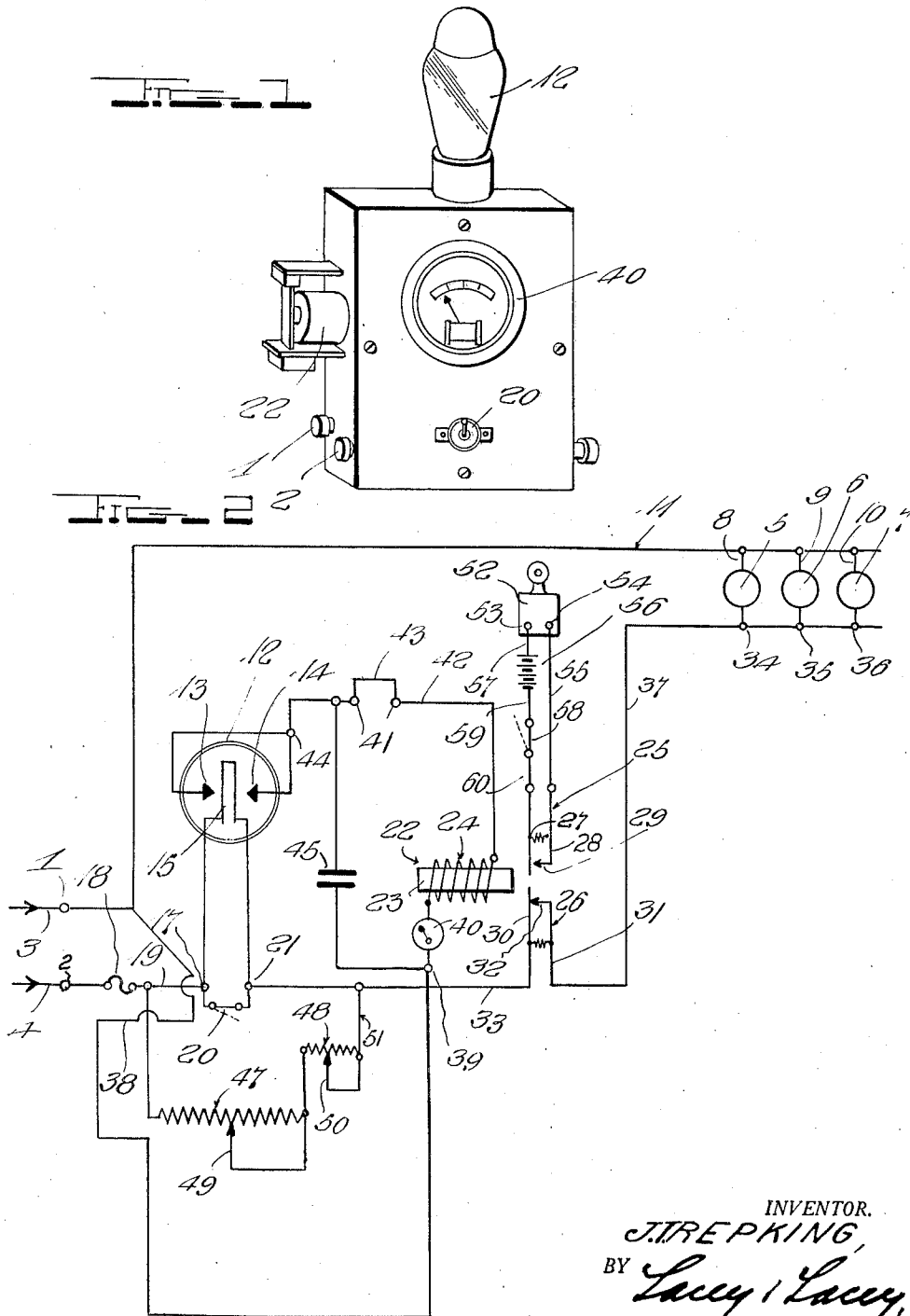
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J. T. REPKING

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ELECTRONIC ALARM

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INVENTOR.
J. T. REPKING,
BY *Lacey & Lacey,*
ATTORNEYS

UNITED STATES PATENT OFFICE

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ELECTRONIC ALARM

Joseph T. Repking, East Chicago, Ind.

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1 Claim. (Cl. 177—311)

This invention relates to alarms and more particularly to an electronic alarm.

One object of the invention is to provide an electronic alarm by the use of which it will be possible to indicate, by means of an audible signal, that a lamp or other electrical device connected in the circuit with the alarm has become inoperative.

Another object of the invention is to provide an electronic alarm employing means for opening the circuit to the electrical devices connected therewith when an overload occurs.

A further object of the invention is to provide a device of this character wherein provision is made, by the addition of a few parts, for controlling heavy duty current consuming apparatus.

A still further object of the invention is to provide an electronic alarm having means permitting the connection of a closed circuit burglar alarm.

Another object of the invention is to provide an electronic alarm which will function without interfering with proper operation of electrical devices connected in circuit therewith, and wherein means is employed to permit adjustment of the potential to be delivered to the current consuming devices.

And a further object of the invention is to provide an electronic alarm which will be simple in construction and efficient in operation.

Further objects of the invention will become apparent during the course of the following description.

In the drawing:

Figure 1 is a perspective view of my improved electronic alarm, and

Figure 2 is a diagrammatic view showing the circuit employed.

In Figure 2 of the drawing, the numerals 1 and 2 indicate the input terminals of the circuit, which input terminals are normally connected with a conventional service line, the wires of which are shown at 3 and 4. At 5, 6 and 7 are shown lamps which are of conventional design. In this connection, it should be understood that, if desired, other current consuming devices may be employed in lieu of the lamps 5, 6 and 7. The lamps have corresponding terminals 8, 9 and 10 connected to a conductor 11 which is also connected with the terminal 1. It will thus be seen that one terminal of the service line is connected with corresponding terminals of the lamps.

At 12 is shown a rectifier tube of the full wave variety. It should be understood that I do

not limit myself to the use of a full wave rectifier tube as, should it be so desired, a half wave tube may be used. The rectifier tube 12 includes anodes 13 and 14 and a filament or cathode 15. The anode 13 is connected with the anode 14. The cathode or filament has one terminal 17 connected with one terminal of a protecting fuse 18 by a conductor 19. The remaining terminal of the fuse 18 is connected to the terminal 2, and thus to the service wire 4. The terminal 17 is also connected to one terminal of a short circuiting switch 20, the other terminal of said switch being connected with the remaining terminal 21 of the filament.

At 22 is shown the control relay of my improved alarm. Said relay includes a pole piece 23 and a coil 24. The relay also includes a pair of switches 25 and 26. The switch 25 is a normally open circuit switch and includes an armature 27 and a contact arm 28, on which is mounted a contact 29. The switch 26 is of the normally closed circuit type and includes an armature 30 and a contact arm 31 on which is mounted a contact 32. The switches 25 and 26, of course, form part of the relay 22.

The filament terminal 21 is connected to the armature 30 by means of a conductor 33 and the contact arm 31 is connected with corresponding terminals 34, 35 and 36 of the lamps 5, 6 and 7 by a conductor 37. It will now be seen that the lamps are connected to both wires of the service line so that, when current is applied to the service line, the lamps will be illuminated.

Connected with the conductor 3 is one terminal of a conductor 38, said conductor having its opposite terminal connected with one terminal 39 of a milliammeter 40. The other terminal of the milliammeter is connected with one terminal of the coil 24 of the relay 22. The other terminal of the coil is connected to one of a pair of auxiliary terminals 41 by a conductor 42. A jumper 43 normally short circuits the terminals 41. The other of the terminals 41 is connected with the anode 14 by conductor 44. Connected between the conductor 44 and the terminal 39 of the milliammeter 40 is a filter condenser 45 which is of conventional design.

In order to control the potential to be delivered to the lamps 5, 6 and 7, I employ rheostats 47 and 48 which are connected in series with each other and between the conductors 19 and 33. That is to say, one terminal of the rheostat 47 is connected with the conductor 19. The other terminal of the rheostat, including the control arm 49 thereof, is connected with one terminal

of the rheostat 48. The other terminal of the rheostat 48, including the control arm 50, is connected with the conductor 33 by a conductor 51. The rheostat 47 is to be employed for adjusting the current to heavy duty lamps while the rheostat 48 will be employed for adjusting the current to small lamps. It should be understood that, if desired, both of said rheostats may be used, depending upon the particular load and requirements of the current consuming devices.

At 52 is shown an alarm device which may be in the form of an electric bell, buzzer, or the like. The alarm device 52 includes terminals 53 and 54. The terminal 54 is connected to the contact arm 28 by a conductor 55 while the terminal 53 is connected to one terminal of a battery 56 by conductor 57. The other terminal of the battery 56 is connected to a control switch 58 by a conductor 59 and the other terminal of the switch 58 is connected with the armature 27 by a conductor 60.

The operation of my electronic alarm will now be set forth. When the lamps 5, 6 and 7 are turned on, current will, as stated, flow through the conductor 11 to the corresponding terminals 8, 9 and 10 of said lamps. The current will also flow through the conductor 37, the contact arm 31, the contact 32, the armature 30, the conductor 33, the conductor 51, the rheostats 47 and 48, the conductor 19, and through the fuse 18 to the service line 4. The current will, of course, also flow through the filament 15 for heating said filament, it being assumed that the switch 20 is in open position. In view of the fact that the anodes 13 and 14 are connected with the service line, through the various indicated conductors, current will be impressed on said anodes so that, when the filament is heated, rectification will immediately take place. Rectified current will pass through the coil 24 with the result that the armature 27 is swung away from the contact 29. The circuit to the alarm device 52 through the battery 56 will thus be broken. Either the rheostat 47 or the rheostat 48, or both of them, are adjusted until the service line current reaches the proper potential to operate the lamps satisfactorily. The proper current may be read on the milliammeter 40, and is insufficient to cause the armature 30 to move away from contact 32. However, if one of the lamps 5, 6 or 7 burns out, or is displaced, the load on the filament will be decreased with the result that current passing through the coil 24 of the relay 22 will be diminished. When this takes place, the armature will be swung to engage the contact 29 for closing the circuit to the alarm device 52 and sounding the alarm. It is assumed, of course, that the switch 58 is in closed position. As soon as the burned out or displaced lamp has been returned to the proper position, the current

through the coil 24 of the relay will be automatically increased for attracting the armature 27 and breaking the circuit to the alarm device.

In the event that there should be an overload or short circuit, the amount of current passing through the filament 15 will be materially increased with the result that current passing through the coil 24 will also be greatly increased. When this occurs, the armature 30 will be attracted for breaking the connection between the contact 32 and said armature. The circuit to the lamps 5, 6 and 7 will thus be broken. When the circuit to the lamps is broken, however, the filament circuit will be broken and the relay coil de-energized. When this takes place, the alarm contacts will close for sounding the alarm. Also, the other pair of contacts will close for again completing the circuit to the lamps. The lamp circuit will be opened, if the overload persists, by the re-energization of the coil, for starting a new cycle. It will thus be seen that, if an overload exists, it will be indicated by an intermittent sounding of the alarm.

From the foregoing, it will be understood that I have provided a simple and highly efficient electronic alarm which will be operative for sounding a warning either when a current consuming device ceases to function or when the load imposed by the current consuming device becomes too great for safety.

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

An electronic alarm including, in combination with a pair of service lines, and a plurality of current consuming devices, a vacuum tube having an anode and a filamentary cathode, said cathode being connected in series with one of said service lines and said current consuming devices, a relay having pairs of contacts and a coil, said coil being connected between said anode and the other of said service lines, said vacuum tube supplying rectified voltage to said coil, one of said pairs of contacts being normally closed and being connected in said first mentioned service line, alarm apparatus connected to another of said pairs of contacts and comprising a signal, a current source and circuit connections for said signal, current source and last mentioned contacts, said second mentioned contacts being engageable upon diminishing of the flow of rectified voltage in the coil as result of failure of the current consuming devices, for closing the circuit to the signal, said first mentioned contacts being opened intermittently upon the occurrence of an overload due to the variation in rectified voltage passing through the coil, for causing intermittent operation of said alarm signal and current consuming devices.

JOSEPH T. REPKING.