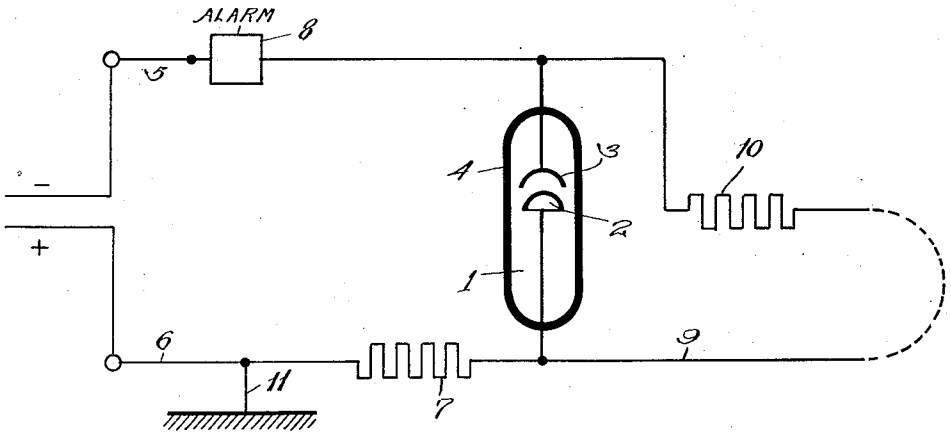
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April 27, 1926. 1,582,745

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ALARM DEVICE

Filed Oct. 22, 1924



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UNITED STATES PATENT OFFICE.

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ALARM DEVICE.

Application filed October 22, 1924. Serial No. 745,116.

To all whom it may concern:

Be it known that we, RUDOLF HERMANN HEINRICH GEFFCKEN and RUDOLF HANS RICHTER, citizens of Germany, and residing at Leipzic-Gohlis, Germany, have invented certain new and useful Improvements in or Relating to Alarm Devices (for which we have filed application in Germany August 23, 1923, Serial No. G59,755), of which the following is a specification.

This invention relates to alarm devices, and is directed more particularly to an arrangement which is especially well adapted for use as a burglar and fire alarm.

The object of this invention is to provide an alarm device which is highly dependable and which is not susceptible to extraneous influences tending to cause false operation thereof.

Heretofore it has been the practice to utilize extremely sensitive electromagnetic devices, such as relays in conjunction with burglar and fire alarms and experience has indicated that those devices are very likely to be influenced by extraneous disturbances, as for example, heavy vibrations, which are apt to arise from various causes. This sometimes results in the giving of false alarms. The prevention of such false alarm is the thing with which the present invention is concerned.

In accordance with this invention electrical discharge tubes are employed instead of the highly sensitive electromagnetic devices heretofore used. The electrical discharge tubes referred to (a common form which is the well-known luminous glow-lamp) are characterized in that they do not function at all until a certain minimum voltage has been applied to their electrodes. This characteristic is taken advantage of in the present invention to produce a highly sensitive arrangement which at the same time is not likely to be effected by any amount of vibratory influence to which the device is not intended to respond.

In the circuit arrangement shown in the accompanying drawing, 1 indicates an electrical discharge device of the glow-lamp type comprising electrodes 2 and 3 which are contained within gas-filled chamber enclosed by the glass envelope 4. 5 and 6 indicate direct current supply conductors to which the terminals of the discharge device 1 are connected. A resistance 7 is shown inserted in the conductor 6 in series with the discharge device and a suitable electrically operative alarm or signal releasing device 8 is shown inserted in the conductor 5 also in series with the discharge device.

The discharge device is shunted by the conductor 9 having in series with it a resistance element 10. Conductor 6 is shown grounded at 11. The values of resistances 7 and 10 and the voltage impressed on the conductors 5 and 6 are so chosen that normally the voltage across the terminals of the discharge device 1 is just below the point at which the latter will function to pass current. If it is assumed that the current supply to conductors 5 and 6 is 250 volts and that the discharge device 1 will function at 160 volts, the resistance 7 and 10 may be so chosen that the voltage normally impressed across the terminals of the discharge device is about 159 volts, that is, just below the value at which the discharge device will function. Under these conditions it has been found in one instance that the resistance 7 may be about 5000 ohms and the resistance 10 about 13000 ohms.

From a consideration of the diagram it is apparent that a small current is continually flowing through the shunt path comprising the conductor 9 and resistance 10. It is also apparent that the voltage across the terminals of the discharge device is lowered by reason of the series resistance 7. By opening the shunt circuit, as for example, by cutting the conductor 9 or by shunting or partially shunting the resistance 7, the voltage impressed across the terminals of the discharge device may be increased to a point above that necessary for it to function. With the circuit grounded as indicated a ground connection to the shunt path, even through a high resistance such as that of a human body, would cause an increase in the voltage across the terminals of the discharge device, and with this increase in voltage, the discharge device functions, whereupon its resistance immediately drops and sufficient current is passed to operate the alarm. Once started the discharge device will continue to operate on a voltage considerably lower than the starting voltage.

Alarm 8 is, of course, so designed that it will not operate on the small current flowing

through the shunt path, but will operate on the increased current which flows when the discharge device functions.

When the arrangement described is utilized as a burglar alarm the conductor 9 is so arranged that it will either be touched or broken by an intruder. Obviously, if it is intended that mere contact with the conductor 9 will cause the alarm to operate, provision must be made so that the body of the person touching the conductor will, at the same time, be grounded, thereby forming a high resistance shunt across the resistance element 7 and consequently increasing the voltage applied to the discharge device to a value sufficient to cause it to function.

The embodiment of the invention illustrated and herein described has purposely been made very simple so that the principles of the invention may be readily understood. It is thought that many specific applications of the invention will readily suggest themselves to those skilled in the art.

If alternating current is to be utilized instead of direct current, it is sometimes preferable so to form the discharge device that the predetermined minimum voltage at which it functions or the current strength of the discharge from the two directions of current are different, so that a rectifying action occurs. In this way it is possible to actuate a direct current relay for releasing the signal. Furthermore, when employing alternating current discharge devices, a direct current voltage may be usefully superposed on the alternating current voltage in order to maintain a discharge when once set up.

The invention should, therefore, not be construed as limited to the arrangement described herein, but only in accordance with the scope of the appended claims. By the term "alarm" as used in the claims, equivalent elements such as signals and signal releasing devices and relays are included.

What is claimed is:

1. In a protective alarm system, a circuit extending through an area to be protected, means for supplying current at a substantially constant potential to said circuit, a discharge tube shunting said circuit, the potential of the source being above the tube discharge potential and the resistance of the circuit being such that the potential across the tube is normally maintained below such discharge potential, said system also including an alarm means set into operation on the passage of current through the discharge tube.

2. In a protective alarm system, a circuit extending through an area to be protected, means for supplying current at a substantially constant potential to said circuit, a discharge tube shunting said circuit between the source of current and said protected area, the potential of the source being above the tube discharge potential and the resistance of the circuit being such that the potential across the tube is normally maintained below such discharge potential, said system also including an alarm means set into operation on the passages of current through the discharge tube.

3. In a protective alarm system, a circuit extending through an area to be protected, a source of current, a discharge tube in said circuit in parallel with the circuit extending through the area to be protected, the potential of the source being above the tube discharge potential, a resistance between the source of current and the tube, a resistance in the circuit extending through the area to be protected, the values of the resistances being such that the potential normally impressed across the discharge tube is slightly below that necessary to cause the occurrence of a discharge therein, said system also including an alarm means set into operation on the passage of current through the discharge tube.

In testimony whereof we affix our signatures.

RUDOLF HERMANN HEINRICH GEFFCKEN.
RUDOLF HANS RICHTER.