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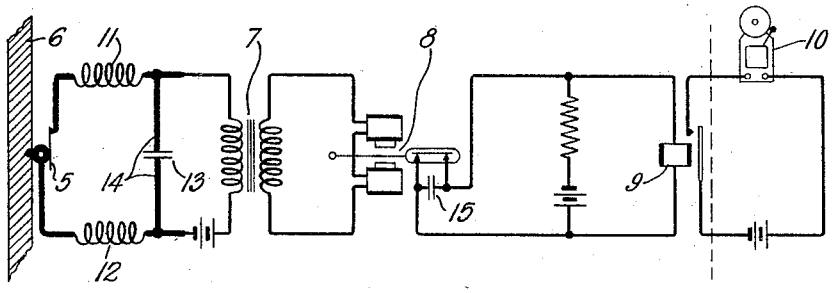
ALARM SYSTEM

Filed May 21, 1927



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ALARM SYSTEM

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This invention relates to alarm systems and particularly burglar alarm systems employing carbon button transmitters and used for the protection of vaults and the like.

An object of the invention is to protect the carbon button employed in such systems from the harmful effects of high frequency oscillations.

In some types of alarm systems, for the protection of vaults and the like, a sensitive telephone transmitter is arranged in contact with the wall or shell of a vault, or other structure to be protected, so that vibrations in the wall which may be caused by an instrument being used to force an entrance into the protected structure will give an indication in the alarm circuit. For this purpose, the transmitter must be extremely sensitive. However, it has been found that high frequency oscillations such as may be set up by switching operations or by induction from neighboring circuits will cause such electrical packing or cohering of the carbon granules as to make the transmitter insensitive.

In accordance with this invention, there is connected between the transmitter and the circuit into which it operates, a circuit which will suppress high frequency oscillations and thereby protect the transmitter from their harmful effects, while transmitting waves of frequencies produced by vibrations of the structure. The most adequate protection is obtained by the use of a low-pass filter consisting of series inductance and shunt capacity. However, a condenser of proper value connected in shunt to the transmitter or an inductance coil connected in series therewith greatly reduces the effect of the disturbances.

Since the network is employed primarily for protecting the transmitter against induced oscillations, it must be connected directly to the transmitter so that the leads therebetween are so short that no currents will be induced therein.

The invention is illustrated in the accompanying drawing, which shows diagrammatically a burglar alarm circuit embodying this invention.

Referring to the drawing, there is shown a highly sensitive transmitter 5 which is preferably of the type disclosed in Patent 1,426,757, granted to C. R. Moore, August 22, 1922. This transmitter is mounted on the interior of a wall 6 of the vault or other structure to be protected. The transmitter is connected through appropriate leads to the primary of a transformer 7, the secondary of which is connected to the windings of an alternating current relay 8 of the vibrating contact type. The contacts of this relay are arranged to normally short circuit the winding of a relay 9. However, when the relay 8 is operated by waves of frequencies in the neighborhood of the resonant frequency of its armature, the short circuit on the relay 9 is removed, causing the relay to operate and close the circuit of the alarm bell 10. The circuit arrangement as above described is of the type disclosed and claimed in the copending application of H. A. Frederick 105,089, filed April 28, 1926, Patent 1,762,793 granted June 10, 1930.

In order to protect the transmitter 5 from high frequency oscillations which may be induced in the circuit from neighboring electrical circuits and also from high frequency transient oscillations such as may be set up by switching operations, inductance coils 11 and 12 are connected directly in series with the transmitter and the condenser 13 is connected in shunt to the coils and transmitter. These elements form a low-pass filter which is designed to transmit the waves generated by the transmitter 5 and effectively suppress any high frequency oscillations in the remainder of the circuit and prevent their being transmitted to the transmitter 5. The elements of this filter should be connected directly to the transmitter 5 and are preferably mounted in the same box therewith. Also, since the troublesome oscillations may be of very high frequency, it is necessary that the connections 14 associated with the condenser 13 be very short, as otherwise their inductive reactance at the high frequencies will be so large as to give a high impedance to the shunt path, thus in effect counteracting the action of the condenser. For a similar reason, the coils 11 and 12 must be de-

signed to have a very low distributed capacity. The effect of the inductance coils may be further increased by winding them on a common core in series aiding relation.

A condenser 15 is connected in shunt to the light contacts of the relay 8 as otherwise they may be cohered due to the action of high frequency oscillations.

It has been found that the arrangement of this invention, as above described, affords such a high degree of protection that it is even possible to operate a powerful spark set in the neighborhood of the circuit without effecting its operation while otherwise the alarm would be completely disabled.

What is claimed is:

1. A burglar alarm system comprising in combination with the wall of a structure to be protected, an inertia type transmitter button mounted thereon containing comminuted material and responsive to vibrations imparted to the wall, a circuit including an alternating current relay operatively associated with said button, a circuit including a relay short-circuited at the normal contact of said alternating current relay, an alarm circuit operatively associated with said relay and controlled thereby, and a low-pass filter permanently connected between the transmitter button and said relay.

2. A burglar alarm system comprising in combination with the wall of a structure to be protected, an inertia type transmitter button mounted thereon, containing comminuted material and responsive to vibrations imparted to the wall, a voice frequency relay operatively associated with said button, an alarm circuit operatively associated with said relay and closed by the energization thereof, and a low-pass filter comprising series inductance and shunt capacity connected between the transmitter button and the relay, the leads connecting the condenser to the inductance being relatively short and the inductance having a low distributed capacity.

In witness whereof, we hereunto subscribe our names this 18th day of May A. D., 1927.

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