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FAULT INDICATOR FOR CLOSED CIRCUIT INSTALLATIONS

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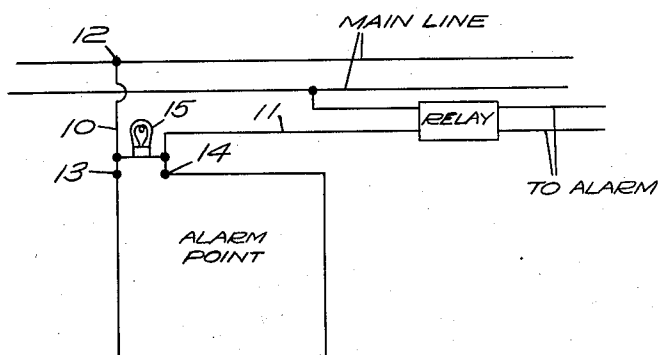


Fig. 1

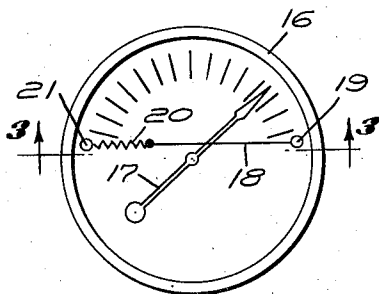


Fig. 2

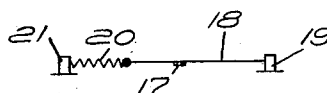


Fig. 3

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FAULT INDICATOR FOR CLOSED CIRCUIT
INSTALLATIONS

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2 Claims. (Cl. 177-311)

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The present invention relates to normally closed circuit installations such as burglar alarm systems and the like, and has specific reference to an indicator for detecting and localizing defects in the line and the installation parts.

The principal object of the invention is to provide a positive indicator which localizes the defect, and thus permits quick repairs to be made.

Another object of the invention is to provide a localizing indicator which operates only when an open or an intermittent break occurs in a closed circuit system, and remains in indicating position until released manually.

With the above and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claims appended thereto.

In the drawings:

Fig. 1 is a diagrammatic view of a portion of a normally closed electric circuit having a local alarm point, a novel indicator being included for disclosing a local break;

Fig. 2 is a plan view of the face of an electric meter which is modified to lock the needle in place after registering a circuit break; and

Fig. 3 is a detail on the line 3-3 of Fig. 1 showing a preferred arrangement for exerting a locking action on the meter needle.

It has been found desirable to provide a positive indication of a local break in a normally closed circuit installation, such as is commonly used for burglar alarms and the like. These systems usually have a series of local alarm points, such as windows, doors and other openings, and it often happens that one or more of the local points is disturbed sufficiently by local atmospheric conditions to break the circuit and thus set off the alarm. However, since there is no actual visible break, an exhaustive search is required to find out where the disturbance or break occurred, and complete re-wiring is frequently necessary, as the trouble often corrects itself before the investigation and the check up are made. A closed circuit burglar alarm system of standard type, for example, includes a relay for controlling the alarm, the relay normally receiving a constant flow of current from the source of supply, which flows through a number of separate alarm points through switches, lines, and tinfoil back to the source of supply. When a pronounced break occurs at any alarm point the difficulty can be visually located, but a minor break caused

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by movement of the tinfoil or other parts due to atmospheric changes, gusts of wind and the like, does not lend itself to visual inspection, and it thus becomes necessary to check each alarm point circuit;

I have found it feasible to connect an indicator of the tell-tale type across each alarm point installation, the preferred indicator being a flash bulb. When an intermittent break occurs within any of the installations, the current passes through the flash bulb at that installation, which cannot carry the line current and therefore burns out. The particular defective installation is thus positively identified, and repair of the break is rapid, as no other installation need be tested.

Referring to the drawings, the line 10, 11 is conveyed through an alarm point or installation by connections 12, 13 and 14, the alarm point being in series with an alarm relay in the usual manner, to provide a normally closed electric circuit which operates the alarm whenever the circuit is broken. I have connected an indicator 15 in parallel with the alarm point, whereby it normally receives insufficient current for registering but receives full line current if the circuit at the alarm point becomes broken. The indicator 15, which preferably is a flash bulb, then burns out, and thus positively indicates the local installation where the current was broken. Instead of a flash bulb, any similar positive indicator which normally is not operated when placed in parallel with a local alarm point circuit, may be used, such as for example, a visible type fuse or a relay or circuit breaker.

For certain local installations a voltmeter or ammeter may be placed in the alarm point circuit, the parts being so arranged that when a break occurs and causes the meter needle to move, the needle is releasably retained in moved position until manually released, thus giving a positive indication which localizes the break.

One preferred manner of register-locking a meter needle in place is shown in Figs. 2 and 3, wherein the meter 16 is provided with the usual indicating needle 17, and a tension wire 18 is fastened at one end 19 to the meter face, and is connected to a coil spring 20, the outer end of which is also fastened to the meter face as indicated at 21, whereby the wire 18 extends across the path of travel of the needle in frictional contact therewith. The tension of the wire 18 on the needle is adjusted so that the needle will move when a break in the closed circuit at the alarm point occurs, but will be frictionally held

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so as not to swing back to its initial position until the wire 18 is manually lifted or its tension otherwise released sufficiently to permit the needle to swing to its original indication for the normally closed circuit.

It is thus clear that I have provided an indicator for visually disclosing a break in a local alarm point installation, which is physically changed, as by burning out or by moving, whenever a break occurs in the normally closed electrical circuit of the installation.

Although I have described specific constructional arrangements for positively indicating a local break in a normally closed electrical circuit, it is obvious that other arrangements for obtaining the desired indication may be utilized, within the spirit and the scope of the invention as defined in the appended claims.

I claim:

1. In an alarm apparatus, in combination, a current source, wiring including alarm sections in a normally closed circuit, an alarm, a relay in series with the normally closed alarm section circuit and operable on opening of the circuit of an alarm section to actuate the alarm, and an indicator in parallel with each alarm section, said indicator being unaffected by the normally closed circuit and physically effected upon breaking of

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its alarm section circuit by passage of full circuit therethrough.

2. In an alarm apparatus, in combination, a current source, wiring including alarm sections in a normally closed circuit, an alarm, a relay in series with the normally closed alarm section circuit and operable on opening of the circuit of an alarm section to actuate the alarm, and an indicator in parallel with each alarm section, said indicator being unaffected by the normally closed circuit and physically effected upon breaking of its alarm section circuit by passage of full circuit therethrough, said indicator including an indicating fuse.

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