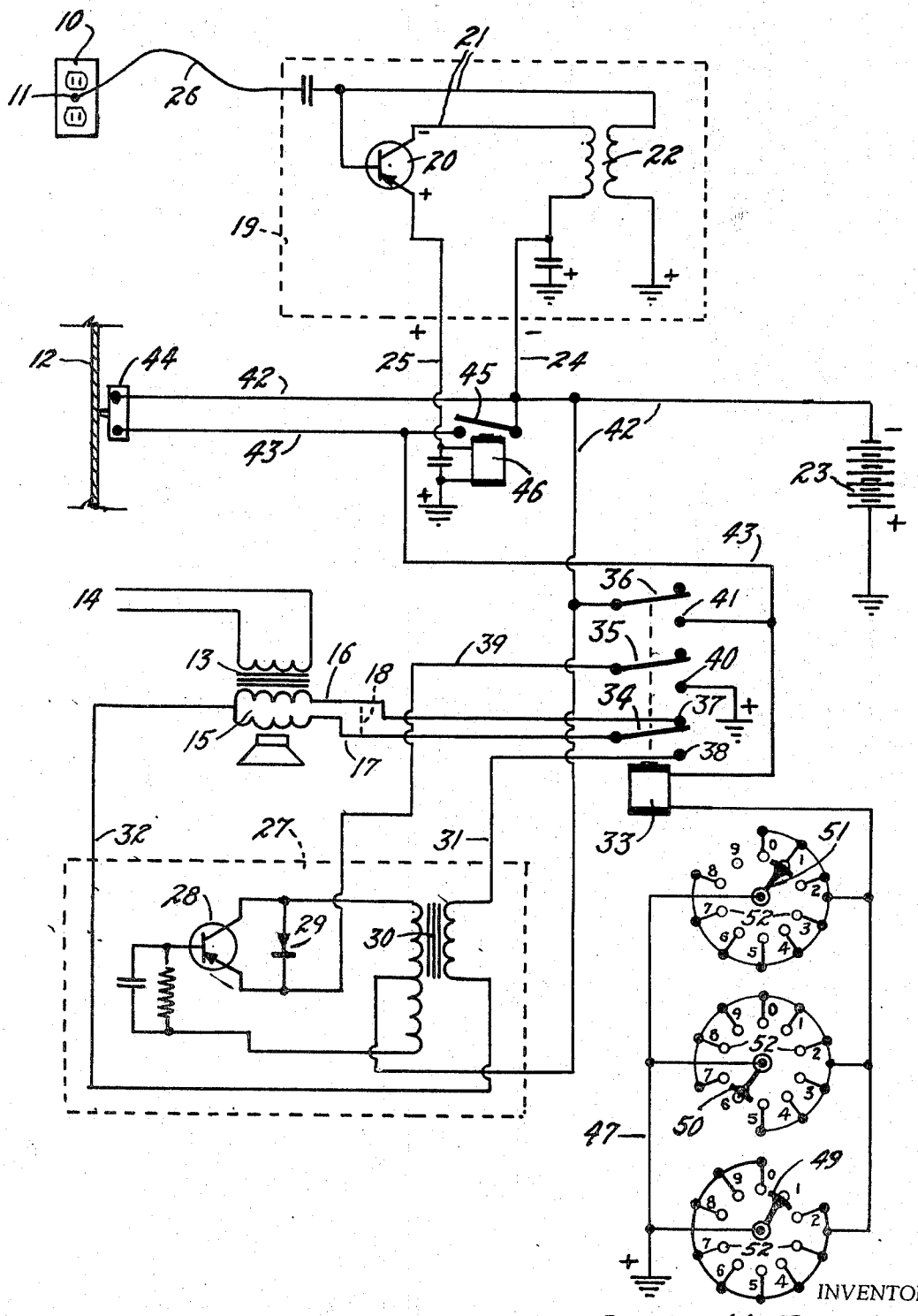
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THEFT ALARMS FOR TELEVISION SETS

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THEFT ALARMS FOR TELEVISION SETS

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ABSTRACT OF THE DISCLOSURE

An R-F oscillator supplies R-F current to an A-F oscillator which is coupled to the voice coil of a television receiver set to produce an audible signal. The R-F oscillator is maintained inoperative by connecting a ground lead to additional capacitance at the receiver location. The A-F oscillator is maintained inoperative by a microswitch which is normally held open by physical contact with the back panel of the set. The current supply from a self-contained battery can be shut off by authorized personnel by actuation of a combination of rotary switches.

It is the present custom to install television sets for the attraction of, and for the pleasure of, overnight tenants in hotels and motels. Unfortunately, all of the tenants are not strictly honest and the presence of an expensive television set in close proximity to convenient conveyance facilities, as are found especially in motels and motor hotels, presents quite a temptation to the unscrupulous tenant and results in exceedingly heavy monetary loss to the landlord.

The principal object of this invention is to incorporate a self-contained alarm-signal circuit in the cabinet of a conventional television set, which will operate automatically to cause the set to emit a loud, easily audible, attention-attracting, assistance-calling sound should an unauthorized person attempt to disconnect, or gain admission to, the set.

Another object is to so arrange the alarm-signal circuit that it will continue to operate even after the set has been disconnected from, and removed from, its installed location.

A further object is to provide means whereby authorized personnel can disconnect or gain access to the set for removal, replacement and repairs without sounding the audible alarm.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the circuit diagram of the theft alarm of this invention shown on the accompanying drawing.

Conventional T.V. set elements are diagrammatically illustrated in the drawing and designated by numerals as follows: wall receptacle **10**, cover plate screw on wall receptacle **11**, removable back panel of T.V. set **12**, primary of a speaker transformer **13**, speaker leads of T.V. set **14**, and the speaker voice coil **15**. In a conventional speaker the voice coil **15** comprises two, series connected, matching coils the conductors to which, indicated at **16** and **17**, are shorted, as indicated by the dotted line **17**, in the conventional T.V. The only change made in the conventional T.V. circuit is to remove the "short" **17** and connect the conductors **16** and **17** to relay contacts to be later described.

The theft-alarm of this invention employs a conventional R-F oscillator, as outlined by the broken line rectangle, **19**. The R-F oscillator is of the capacitance type having a transistor **20**, the collector and base of which are in series with an oscillating circuit **21**, including a conventional turning coil **22**, which is energized, from a positive grounded battery **23**, through a negative lead **24** and a positive lead **25** so as to oscillate at a radio frequency (such as 400 kc./s.).

When installed in a T.V. set for theft protection a flexible additional-capacitance-lead **26** is connected between the oscillating circuit **21** and the cover plate screw **11** of the receptacle **10**. This places sufficient additional coupled capacitance in the tuned circuit **21** to detune the latter and prevent oscillation. However, should the additional-capacitance-lead **26** be cut, broken or disconnected, the R-F oscillator will immediately oscillate to produce a radio frequency to actuate the audio portion of the alarm device.

The audio portion of the alarm device comprises a conventional A-F oscillator, as outlined by the broken line rectangle **27** in the drawing, which may be of any suitable type to energize the voice coil **15** of the T.V. set. As illustrated, the A-F oscillator **27** is provided with a transistor **28**, the collector and emitter of which are bridged by a diode **29** to prevent voltage surges from damaging the transistor **28**, and which provide AC current to the primary of an oscillation transformer **30** the secondary of which furnishes operating current to the voice coil **15** through voice coil leads **31** and **32**.

The actuation of the audio portion of the device is controlled by a triple-bladed, double-throw, spring-loaded relay consisting of a solenoid **33** which, when energized, simultaneously actuates three switch blades **34**, **35** and **36**.

The switch blade **34** is connected to the voice coil conductor **17** and is normally closed against a contact **37** which is connected to the other voice coil conductor **16**. Thus, the blade **34** normally replaces the conventional "short" **18** so that the voice coil will function normally when the theft alarm is dead. However, should the solenoid **33** be energized the blade **34** will be swung into contact with an A-F contact **38** which is connected by means of the voice coil lead **31** to the oscillation transformer **30** so that the voice-coil will respond to the frequency of the A-F oscillator **26**.

The switch blade **35** is connected to the emitter of the transistor **28** through a positive conductor **39** and, when the solenoid **33** is energized, contacts a ground contact **40** to complete the positive circuit between the battery **18** and the A-F oscillator **26**.

The negative D.C. for the alarm circuits is supplied from a main negative conductor **42** connected directly to the battery **23** and the negative current to the solenoid **33** is conducted through a solenoid conductor **43**. Normally there is no current flow from the main conductor **42** to the solenoid conductor **43**, for the circuit is broken by a normally closed micro-switch **44** and a normally open switch blade **45** the closure of either of which will complete the negative circuit to the solenoid **33**.

The micro-switch is held open by physical contact with the back panel **12** of the T.V. set. The switch blade **45** is resiliently held open and will be attracted to the closed position by energizing a high impedance, actuating-solenoid **46** which is series connected in the oscillating circuit of the R-F oscillator **19**. Therefore, if either the back panel **12** be removed, to cause the micro-switch to close, or the capacitance lead **25** be cut or removed, so as to energize the solenoid **46** and initiate oscillation of the R-F oscillator **19**, the negative main **42** will be directly connected to the solenoid conductor **43** to conduct negative current to the solenoid **33**.

The positive D.C. is supplied from the positive ground of the battery through a positive conductor **47** and a solenoid conductor **48**, between which, three rotary multiple contact switches **49**, **50** and **51**, of the "shorting" type, are individually series-connected. Each of the rotary switches, when rotated, makes successive contacts with an annular series of contacts **52**. All of the contacts **52**, except one in each series, are connected to the solenoid

conductor **48**. For instance, as illustrated, contact "1" in switch **49**, contact "6" in switch **50** and contact "9" in switch **51** are not connected to solenoid conductor **48**. Therefore, if all of the switches are positioned upon a non-connected contact, such as the contact "1" in switch **49**, the contact "6" in switch **50** and the contact "9" in switch **51**, no positive current will flow and the theft alarm will be inoperative. Any other arrangement of any or all of the switches will maintain the alarm in operative condition.

The switch blade **36** closes against a solenoid contact **41** to maintain the solenoid **33** energized even though attempts are made to open the micro-switch **44** and/or the micro-switch blade **45**. Once started, the theft alarm cannot be shut off except by placing all of the rotary switches **49**, **50** and **51** in the correct open circuit combination or by removing or disconnecting the battery **23**. Since these elements are built into the cabinet of the set in relatively concealed positions, disconnection of the alarm by unauthorized personnel is a remote possibility.

The speaker transformer **13** is of the magnetic core variety, so the voice coil, when energized by A-F oscillator, operates in the residual magnetic field of the core when the T.V. set circuits are inoperative.

While a specific form of the invention has been described and illustrated herein, it is to be understood that the same may be varied with the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. A theft alarm for an electronic instrument set comprising:

(a) a battery;

(b) an R-F oscillator of the capacitance-tuned type energized by said battery;

(c) an A-F oscillator;

(d) means actuatable by the R-F current from said R-F oscillator to connect said A-F oscillator to said battery;

(e) a magnetic speaker including a voice-coil connected to receive an A-F signal from said A-F oscillator;

(f) a capacitance lead from the oscillating circuit of said R-F oscillator adapted to be connected to additional connected capacitance exteriorly of said set and acting to detune said R-F oscillator to prevent oscillation thereof until said capacitance lead is disconnected;

(g) a removable panel in said set;

(h) a normally-closed micro-switch in the battery circuit of said A-F oscillator held open by physical contact with said panel so that removal of said panel will close the battery circuit to said A-F oscillator to energize said voice coil;

(i) a first solenoid energized by the radio frequency current from said R-F oscillator;

(j) a first solenoid switch blade attractable by said solenoid to close the battery circuit to said A-F oscillator;

(k) a second solenoid energized by closure of the first solenoid switch blade;

(l) a second switch blade attractable by said second solenoid to close a circuit from said A-F oscillator to said voice coil;

(m) a third switch blade attractable by said second solenoid to close the battery circuit to said A-F oscillator;

(n) manually operable switching means for disconnecting both of said oscillators from the battery when desired; and

(o) a plurality of independent multi-contact switches, each switch having a contact closing element adapted to successively contact a plurality of independent contacts, said contact closing element and said contact being connected in series between a pole of said battery and said theft alarm so that if any contact in any switch is closed, current can flow to said theft alarm and if a contact in every switch is open no current can flow to said theft alarm.

2. A theft alarm for a television set as described in claim **1** having a plurality of independent rotary multi-contact switches of the "shorting" type for connecting and disconnecting both oscillators from said battery, each switch having a contact-closing element adapted to successively contact a plurality of independent contacts, said contact-closing element and certain of said contacts being connected in series between a pole of said battery and said theft alarm so that if a certain contact in any of the switches is closed, current can flow to said theft alarm and if a contact in every switch is open, no current can flow to said theft alarm.

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