

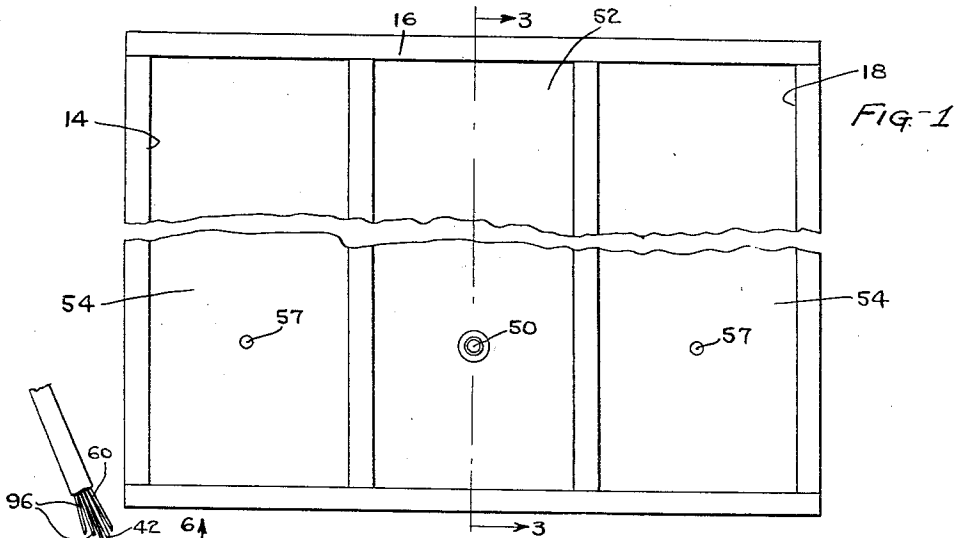
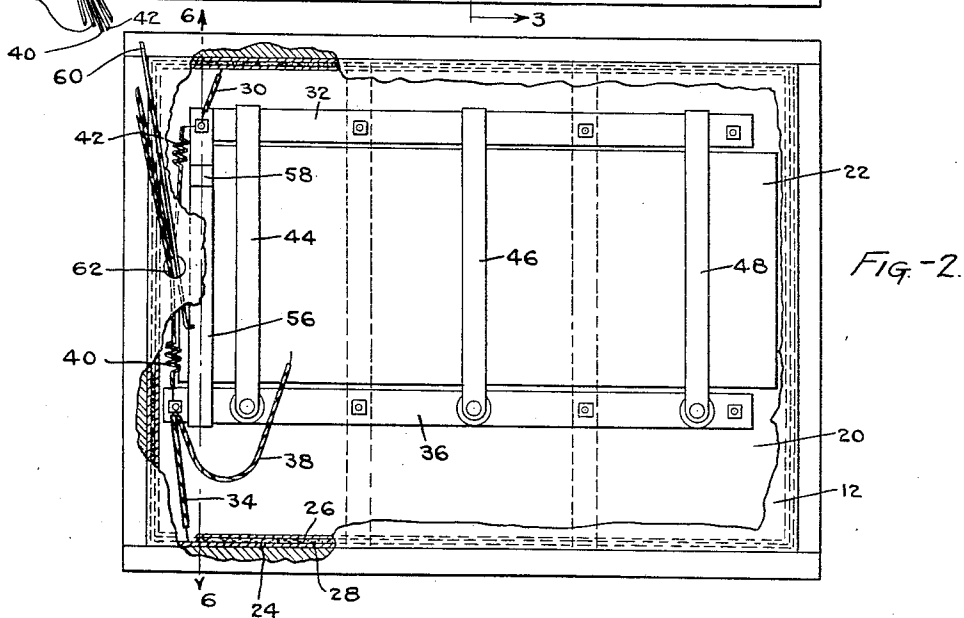
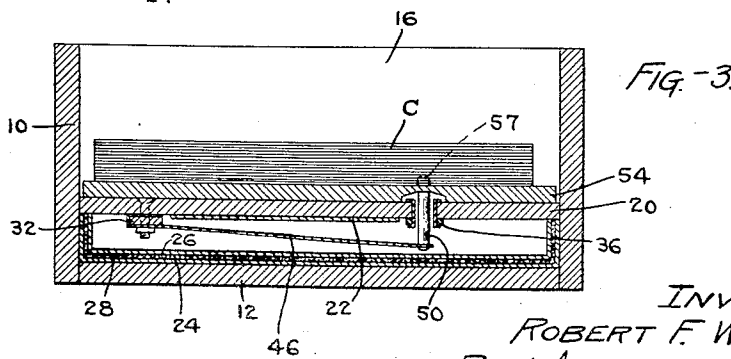
May 20, 1924.

1,494,656

R. F. WHERLAND
ELECTRICAL BURGLAR ALARM

Filed Oct. 20, 1921

3 Sheets-Sheet 1



INVENTOR:
ROBERT F. WHERLAND
BY Whiteley and Ruckman
ATTORNEYS.

May 20, 1924.

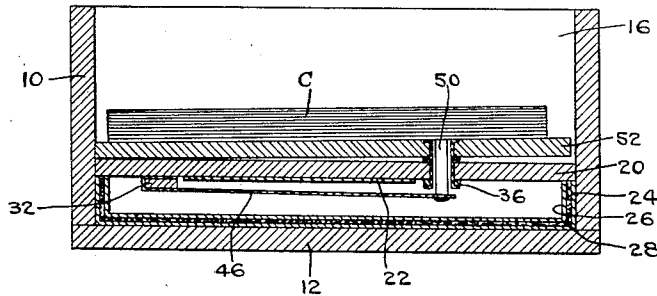
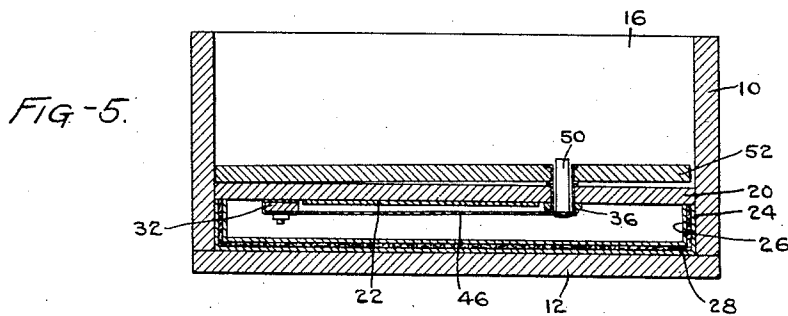
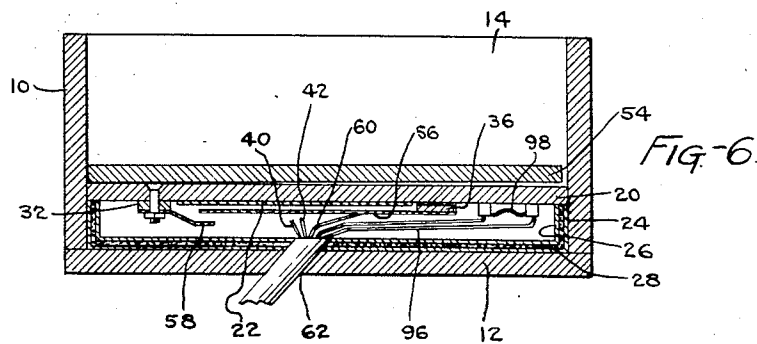
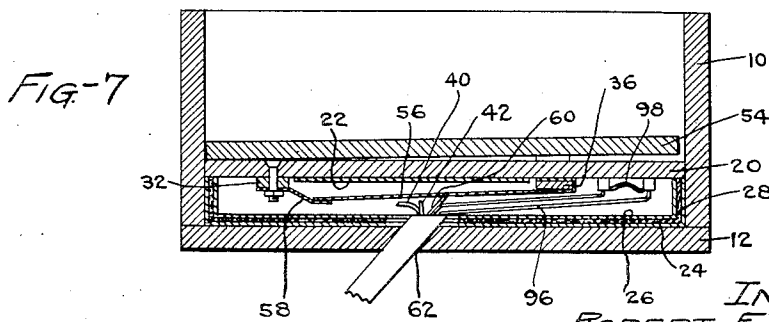
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3 Sheets-Sheet 2



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ELECTRICAL BURGLAR ALARM

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3 Sheets-Sheet 3

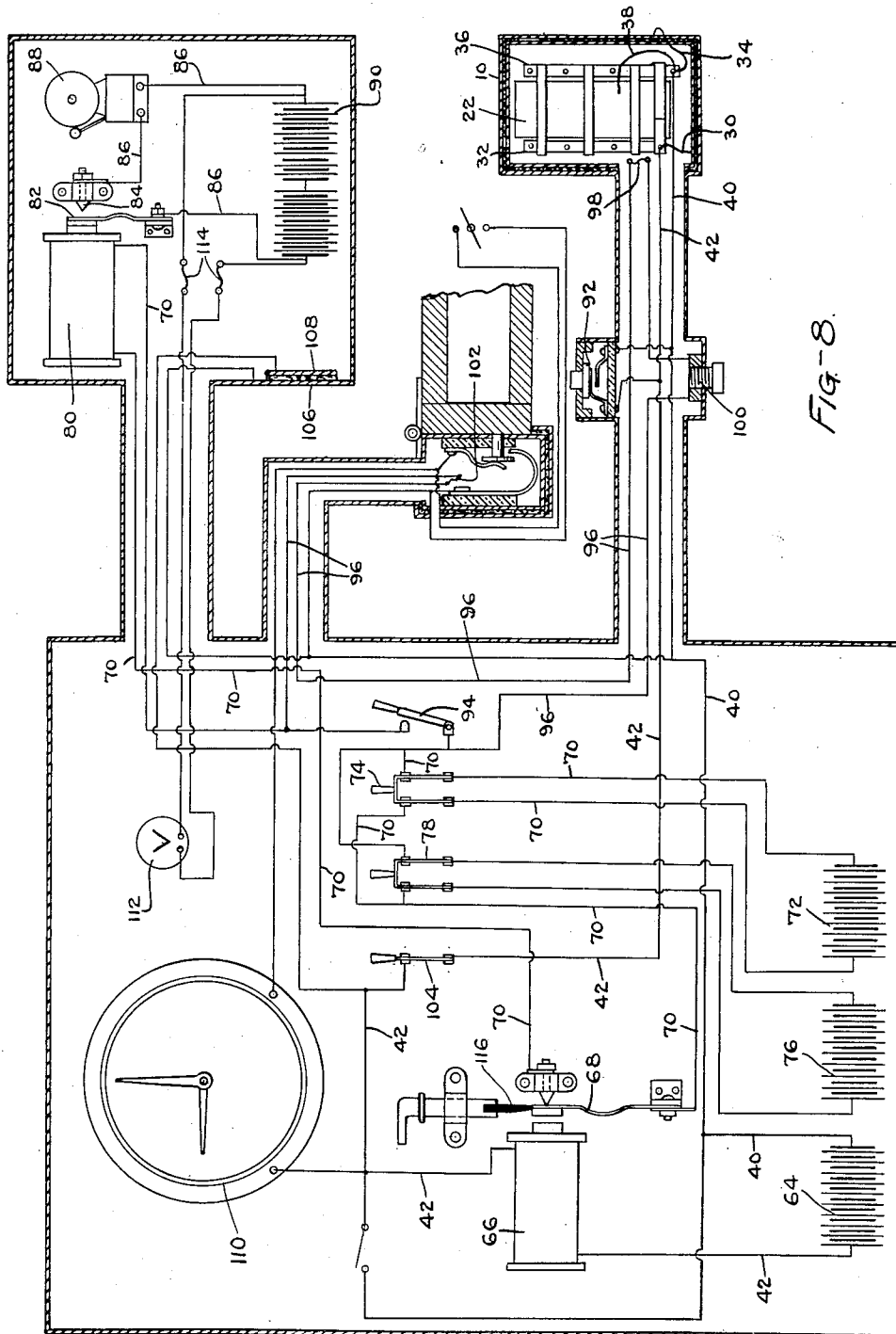


Fig. 8.

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UNITED STATES PATENT OFFICE.

ROBERT F. WHERLAND, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO WHERLAND
ALARM COMPANY, OF MINNEAPOLIS, MINNESOTA.

ELECTRICAL BURGLAR ALARM.

Application filed October 20, 1921. Serial No. 509,139.

To all whom it may concern:

Be it known that I, ROBERT F. WHERLAND, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Electrical Burglar Alarms, of which the following is a specification.

My invention relates to electrical burglar alarms, and an object is to provide a device suitable for use in banks or other places by means of which an alarm will be caused to operate by a burglar when he attempts to remove currency or bills from a drawer or from a container on the counter or in the vault containing the same. Another object is to provide means by which the alarm will be operated when the burglar tampers with the container by attempting to open it or by drilling into the same.

The full objects and advantages of my invention will appear in connection with the detailed description, and the novel features embodied in my inventive idea will be particularly pointed out in the claims.

In the accompanying drawings which illustrate one form in which my invention may be embodied,—

Fig. 1 is a top plan view of a container. Fig. 2 is a bottom plan view thereof with a portion broken away to show electrical connections. Fig. 3 is a view on the line 3—3 of Fig. 1 showing a loose bottom in the container and currency placed thereon. Fig. 4 is a view similar to Fig. 3 showing another form of loose bottom in place with currency thereon. Fig. 5 is a view similar to Fig. 4 but showing the currency removed. Fig. 6 is a view in section on the line 6—6 of Fig. 2. Fig. 7 is a view similar to Fig. 6 showing how the electric circuit is completed when an attempt is made to pull out the cable of wires from the container. Fig. 8 is a view showing a wiring diagram of a burglar and fire alarm system containing my invention.

Referring to the construction shown in the drawings, I provide a container designated in general by the numeral 10 and having a bottom member 12. This container may be located in any suitable place such as at the position occupied by the cashier in a bank and may be of such size as to provide any desired number of compartments for containing currency, bills or valuable docu-

ments. In the embodiment shown, there are three of these compartments designated by the numerals 14, 16 and 18, and these compartments are provided with a false bottom 20 on the lower side of which is secured a metal plate 22. The space between the bottom 12 and the false bottom 20 is lined with two layers of metal 24 and 26 separated by insulating material 28. The layer of metal 26 is connected by a wire 30 with a bus bar 32 while the outer layer of metal 24 is connected by a wire 34 with a bus bar 36 and the metal plate 22 is connected by a wire 38 with the bus bar 36, all as will be evident from Fig. 2. A wire 40 is connected to the bus bar 36 and a wire 42 is connected to the bus bar 32, these two wires being part of an electrical circuit connecting with a suitable source of electricity and including an alarm or signal device, as will appear later. Secured to the bus bar 32 are three spring fingers 44, 46 and 48, the resiliency of which tends to bring their free ends into contact with the bus bar 36, and these fingers are positioned so as to extend under the middle portions of the compartments 14, 16 and 18 respectively. Secured to the free ends of these fingers are upstanding pins 50 which pass through openings in the false bottom 20 so as to be capable of extending for a short distance up into the compartments which contain the currency. I provide two forms of loose bottoms such as designated by the numerals 52 and 54, these loose bottoms being of a size to fit removably into the compartments 14, 16, 18, and rest upon the false bottom 20. The loose bottom 52 is provided with an aperture so positioned that the pin 50 is adapted to pass therethrough as shown in Fig. 5. When currency designated at C is in a compartment having the loose bottom 52 therein, the weight of this currency is sufficient to depress the pin 50 and the finger 44, 46 or 48 according to the particular compartment. When the currency is removed, one of these fingers comes into contact with the busbar 36 as shown in Fig. 5, and bridges the same with the bus bar 32 so that a circuit is completed with the source of electricity to which the wires 40 and 42 are connected. It is contemplated that only one of the loose bottoms 52 shall be used, and this may be placed in any one of the compartments so as to vary the arrangement as desired. It is intended that the other

compartments shall contain the loose bottoms 54. The loose bottoms 54 are not adapted to allow the pins 50 to come up into contact with the currency but are of sufficient weight to keep the pins depressed. These bottoms are shown provided on their upper sides with dummy pins 57 which occupy the position which would be occupied by the pin 50 if the bottom 52 were in place. This makes it impossible to tell by feeling just which compartment is the one into which the pin 50 extends except the currency be first removed. In case an attempt is made to drill down into the lower space in the drawer for the purpose of holding down one of the fingers to which a pin 50 is attached the drill upon passing through the plate 22 and striking the finger will complete the circuit on account of the wire 38 being attached to the plate 22, and thus the alarm will be sounded. If an attempt be made to drill through the bottom of the drawer or through the sides thereof below the false bottom 20 then the drill upon passing through the insulation 28 will connect the two metal layers 24 and 26 and since these layers are connected respectively with the bus bars 36 and 32 the circuit will be completed and the alarm will be sounded. Secured to one end of the bus bars 36 is a spring finger 56 which extends toward the corresponding end of the bus bar 32 so that the free end of this finger overlaps the free end of a contact member 58 carried by the bus bar 32, these two members being normally out of contact due to the resiliency of the finger. One end of a cord 60 is secured to the finger 56 and this cord passes through an opening 62 in the bottom member 12 of the container so that the other end of the cord may be readily incorporated in the cable of wires associated with the compartment. When the wire 60 is thus attached and an attempt is made to pull out the cable the finger 56 is drawn into engagement with the contact member 58, thus completing the circuit and causing the alarm to sound. The manner in which the alarm is sounded when a circuit is completed at the container in any of the ways previously mentioned will now be described with reference to Fig. 8. The wire 40 is connected to one side of a battery 64 and the wire 42 is connected to the other side of this battery. The wire 42 includes the coil of an electromagnet 66, the armature 68 of which is attracted when the electromagnet is energized. The armature 68 forms part of a circuit 70 adapted to be supplied with current from a battery 72 when the switch 74 is closed. When the switch 74 is opened, the circuit through the armature 68 is adapted to be supplied with current from a battery 76 when a switch 78 is closed. This arrangement allows the batteries 72 and 76

to be used interchangeably so that the matter of renewal is an easy matter. Included in the circuit 70 is the coil of an electromagnet 80 having an armature 82 which is normally attracted away from a contact point 84 by the passage of electric current through the electromagnet. When the electromagnet 66 previously referred to is energized the armature 68 is attracted, thus breaking the circuit 70 and the armature 82 of the electromagnet 80 comes into engagement with the contact point 84. This completes a circuit 86 in which is included a bell or signal device 88 and which is supplied with electric current from a battery 90. A push button 92 may be placed in any convenient position so that the cashier may close the circuit through the wires 40 and 42 to sound the alarm at any time he may wish. I have shown a switch 94 in the circuit 70 and when this switch is open, the current can no longer pass directly through the circuit 70 but will be caused to pass through a shunt circuit 96 joined with the portion of the circuit 70 connected with the electromagnet 80. Fuses such as 98, 100, and 102 placed in the shunt circuit are effective in case of fire in case the switch 94 is open to cut off current from the electromagnet 80 and thus cause the alarm to be sounded. A switch 104 is placed in the circuit of the wire 42. This switch may be an ordinary switch and it may be locked in closed position by a combination lock so that it cannot be opened by anyone who does not know the combination. This switch is opened when the cashier changes the loose bottom 52 from one compartment to another, and also when he removes and replaces currency from the compartment containing this loose bottom. When the currency is removed from this compartment, a weight may be substituted for the currency in order to hold the pin 50 depressed, and thus prevent the alarm from continuously sounding. The container for the currency, bills or documents may be a standard drawer which is changed only on the inside so that its character will not be revealed to outsiders. By reference to Fig. 2 it will be understood that there are four wires in addition to the cord 60 which are placed in a cable associated with the container and with other parts such as the vault door, vault door lock, push button, and alarm box or any part that is to be protected against burglars. Cutting of this cable will open the circuit 70 and the alarm will be sounded since the release of the armature 82 causes the circuit through the alarm to be closed. The alarm box may have outer and inner layers 106 and 108 separated by insulation and connected respectively with the wires 40 and 42 so that if the alarm box is drilled or tampered with, the circuit through the wires 40 and 42 will be closed and the

coil of the electromagnet 66 will be energized, thus breaking the circuit 70 and causing the alarm to be sounded in the manner previously described.

Referring to Fig. 8, 110 designates a clock which electrically connects to the circuit of the vault door and which opens and closes this circuit at the desired time. No one can tamper with the lock or open the vault door when the clock closes the circuit without sounding the alarm. This can only be done upon the arrival of such time as the clock is set to open the circuit. A volt meter is designated at 112 which is for testing the conditions of the battery while fuses 114 protect the battery in the alarm box against short circuits on the lines leading to the volt meter from the alarm box. 116 designates a pin which holds the circuit open when the coil of the electromagnet 66 has been energized. The alarm will continue sounding until this pin is lifted.

A loose bottom 52 is placed in one of the compartments and currency is placed upon this bottom in the compartment to hold down the pin 50 but this currency is not used by the cashier during the day since he uses currency only from the other compartments which are provided with the loose bottoms 54. Therefore there is no liability of the cashier causing the alarm to be operated when he removes currency while performing his duties which require him to pay out currency or to make change. The loose bottom 52 may be changed from one compartment to another from time to time as desired by the cashier who is the only one who knows the particular arrangement with the result that other persons attempting to remove currency will take it from this compartment as well as from the other compartments and hence cause the alarm to be operated. When the currency placed on the loose bottom 52 is removed, the particular one of the spring fingers associated with the compartment is permitted to engage the busbar 36 whereby a circuit is completed from the battery 64 through the wire 42 including the electromagnet 66, the busbar 32, the particular spring finger just referred to, the busbar 36 and back to the battery 64 through the wire 40. When the electromagnet 66 is thus energized, the circuit 70 is broken, thus allowing the armature 82 of the electromagnet 80 to come into engagement with the contact point 84. This completes the circuit 86 connected with the battery 90 which leads through the alarm 88, thereby causing the latter to be operated. Since the metal plate 22 is connected by the wire 38 with the busbar 36 as shown in Fig. 2 if this metal plate is drilled through for the purpose of reaching one of the spring fingers 44, 46

and 48 for the purpose of holding down the particular finger, then the busbars 32 and 36 will be connected through the wire 38, the metal plate 22, the metal of the drill and the spring finger, thereby completing the circuit as just described. Since the outer layer of metal 24 of the container is connected by a wire 34 with the bus bar 36 and the inner layer of metal 26 is connected by a wire 30, with the busbar 32, if these layers of metal be drilled through the busbars will be connected through the metal drill and the circuits will be completed as stated above.

I claim:

1. An electrical burglar alarm comprising a container with compartments for receiving currency, a false bottom in said container, two bus bars below said false bottom, spring fingers secured to one of said bus bars, an alarm and upwardly projecting pins secured to the free ends of said fingers, and adapted to extend through openings in said false bottom into such position that the weight of the currency in any one of the compartments will depress the corresponding one of said pins and the removal of said currency will allow said pin and the associated finger to rise and bridge said bus bars for completing an electrical circuit to operate the alarm.

2. An electrical burglar alarm comprising a container with compartments for receiving currency, a false bottom in said container, two bus bars below said false bottom, spring fingers secured to one of said bus bars, an alarm upwardly projecting pins secured to the free ends of said fingers and adapted to extend through openings in said false bottom into such position that the weight of currency in any one of the compartments will depress the corresponding one of said pins and the removal of said currency will allow said pin and the associated finger to rise and bridge said bus bars for completing an electrical circuit to operate the alarm, a metal plate secured to the lower side of said false bottom and a connection between said plate and the bus bar which is adjacent said pin whereby a circuit will be completed when said plate is drilled through so that the alarm will be operated.

3. An electrical burglar alarm comprising a container with compartments for receiving currency, a false bottom in said container, two bus bars below said false bottom, spring fingers secured to one of said bus bars, an alarm upwardly projecting pins secured to the free ends of said fingers and adapted to extend through openings in said false bottom into such position that the weight of currency in any one of the compartments will depress the corresponding one of said pins and the removal of said currency will allow said pin and the as-

sociated finger to rise and bridge said bus bars for completing an electrical circuit to operate the alarm, a lining consisting of two layers of metal separated by insulation
 5 in the space below said false bottom, a connection between one of said layers and one of said bus bars, and a connection between the other of said layers and the other of said bus bars whereby a circuit will be completed when said lining is drilled through
 10 so that the alarm will be operated.

4. An electrical burglar alarm comprising a container with compartments for receiving currency, a false bottom in said container, two bus bars below said false bottom, spring fingers secured to one of said bus bars, an alarm upwardly projecting pins secured to the free ends of said fingers and adapted to extend through openings in said
 15 false bottom into such position that the weight of currency in any one of the compartments will depress the corresponding one of said pins and the removal of said currency will allow said pin and the associated finger to rise and bridge said bus
 20 bars for completing an electrical circuit to operate the alarm, another spring finger secured to the bus bar which is adjacent said pin, a contact member secured to the other
 25 bus bar in such position as to be engaged by the free end of said spring finger when the latter is depressed, and a wire secured to

said spring finger for depressing the same to complete the circuit and operate the alarm when an attempt is made to pull out
 35 the cable.

5. An electrical burglar alarm comprising a container with compartments for receiving currency, a false bottom in said container, two bus bars below said false bottom, spring fingers secured to one of said bus bars, an alarm upwardly projecting pins secured to the free ends of said fingers and adapted to extend through openings in said
 40 false bottom into such position that the weight of currency in any one of said compartments will depress the corresponding one of said pins, and the removal of currency will allow said pin and the associated finger to rise and bridge said bus bars for
 45 completing an electrical circuit to operate the alarm, a loose bottom adapted to be placed in any one of said compartments between said false bottom and the currency, said loose bottom having an opening through
 50 which said pin is adapted to extend, and loose bottoms for the other compartments, said last mentioned loose bottoms being adapted to hold the associated spring fingers in depressed position so that currency may
 55 be removed without operating the alarm.

In testimony whereof I hereunto affix my signature.

ROBERT F. WHERLAND.