M. E. LAUNBRANCH.

ALARM FOR SAFETY CHESTS.

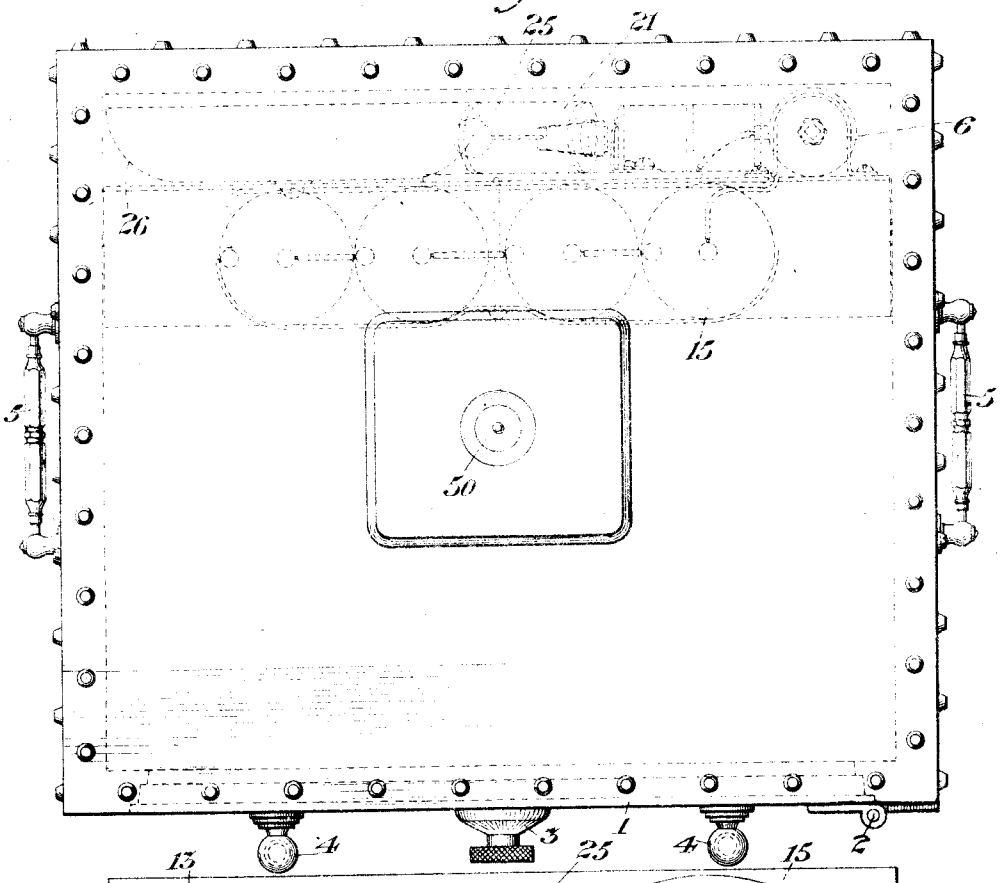
APPLICATION FILED DEC. 15, 1908.

1,188,460.

Patented June 27, 1916.

2 SHEETS—SHEET 1.

Fig. 1



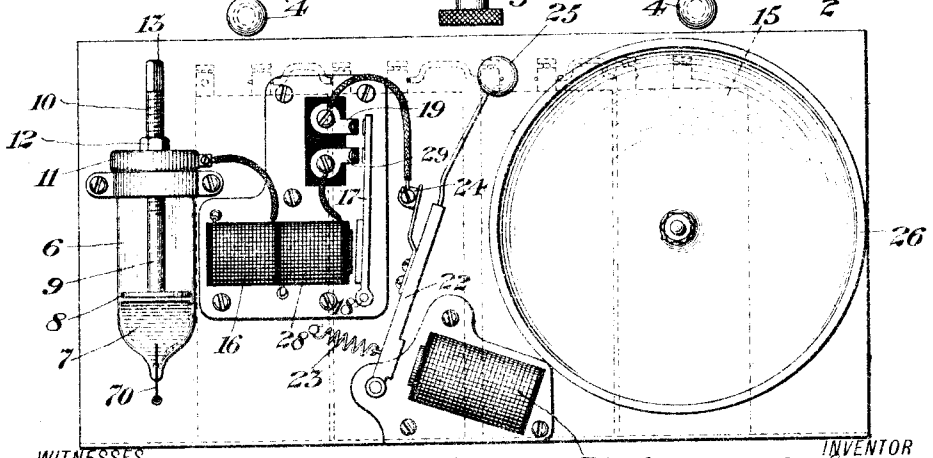


Fig. 2

WITNESSES

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Fig. 3

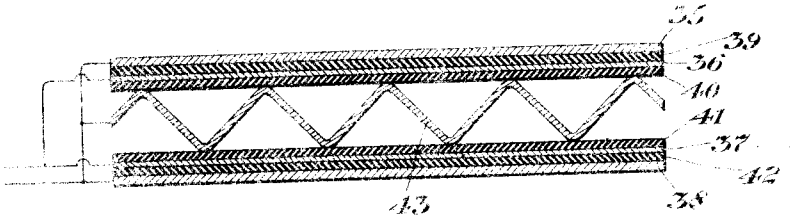
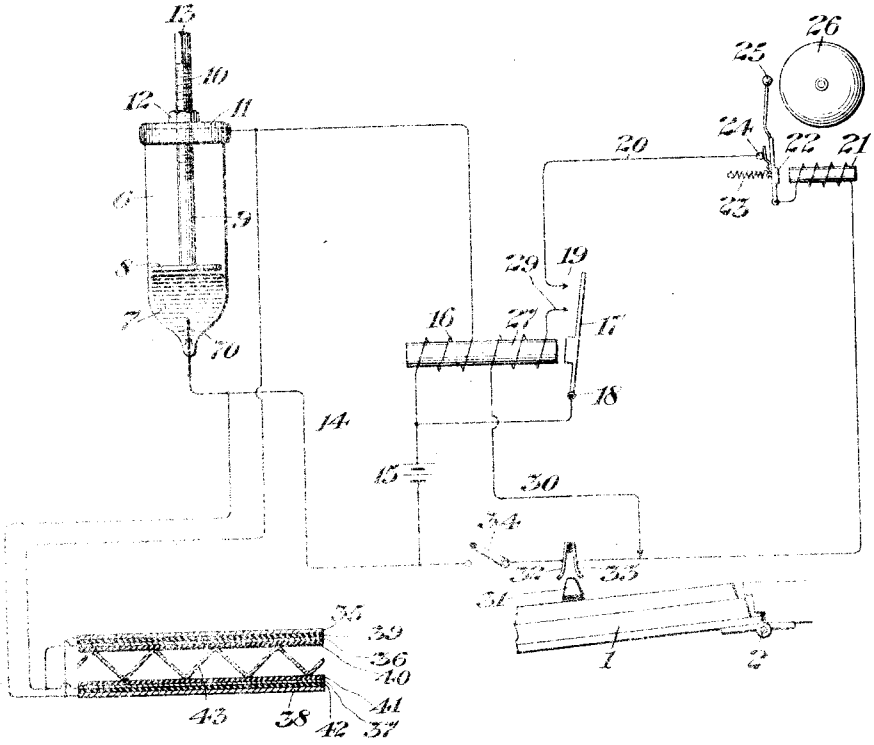


Fig. 4



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UNITED STATES PATENT OFFICE.

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ALARM FOR SAFETY-CHESTS.

1,188,460. Specification of Letters Patent. Patented June 27, 1916.

Application filed December 15, 1908. Serial No. 467,720.

To all whom it may concern:

Be it known that I, MALCOLM E. LAUNBRANCH, a citizen of the United States, and a resident of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Alarms for Safety-Chests, of which the following is a specification.

My invention relates to electrical burglar alarms for safety chests and particularly to alarms which are set off when the safety or jewel chest is slightly tilted, or moved or drilled in an attempt to carry it off or burglarize it.

One of the objects of my invention is to provide a gravity operated circuit closer adapted to close an electrical circuit when the safety chest is tilted in any direction, which will close an alarm circuit, in combination with means for continuing the actuation of the alarm when the circuit at the circuit closer is opened, as by restoring the safety chest to its original level position.

A more particular object of my invention is to provide the relay which closes the alarm circuit with a locking magnet winding so as to lock the circuit closed until it is opened by a contact carried by the door.

Referring now to the drawings which are attached to this specification and form a part thereof: Figure 1 is a plan view of the safety or jewel chest containing my improvements. Fig. 2 is a rear elevation of the plate which is mounted within the jewel chest, and which carries the circuit closer, the locking relay, the electric alarm and accessories. Fig. 3 is a detailed, sectional view of an auxiliary circuit-closer, which closes the circuit when the safe is drilled. Fig. 4 is a diagrammatic view illustrating the arrangement and operation of the gravity operated circuit-closer, the relays, the electric bell and the contact operated by the door for stopping the alarm.

The safety chest is provided with suitable walls and with a door 1, which may be pivoted as at 2, and be provided with an ordinary form of lock, such as a combination lock 3 with a locking bolt mechanism controlled from the handles 4. It may also be provided with the usual handles 5 to permit carrying it from place to place and with a level 50 to level it and the gravity operated circuit-closer within it.

In accordance with my invention, I provide a gravity operated circuit closer, which is adapted to close an electrical circuit when the chest is tilted in any direction, as would occur, for example, if someone tried to carry it off. The form of this circuit closer may be varied. As illustrated, it comprises a glass receptacle 6, which carries mercury 7, or some other liquid, at the bottom. The mercury constitutes the liquid terminal of the circuit closer, and makes connection with a circuit by the electrode 70. The rigid terminal of the circuit closer preferably comprises a plate 8 secured to a rod 9. In the best embodiment of the invention, the rigid terminal is adjustable so as to vary the distance between the rigid terminal and the surface of the mercury. This varies the sensitiveness of the device. When the rigid terminal is closely adjacent to the level of the liquid terminal, the circuit will be closed by a slight tilting or jarring of the safe. If the distance between the terminals is increased, the alarm will respond only after a greater tilting or jarring of the safety chest.

The means for adjusting the rigid terminal may be widely varied. As illustrated, the rod 9 is screw-threaded at 10, and passes through a screw-threaded cap 11 that closes the glass vessel 6. A lock nut 12 secures the rod in its adjusted position and a square end 13 at the top of the rod 9 provides a ready method of turning the rod. The circuit closer closes the electrical circuit 14, which contains a battery 15, and a coil 16 of an electromagnetic relay.

Suitable means are provided whereby the relay will actuate an alarm circuit. As illustrated, the armature 17 of the relay pivoted at 18 closes the contact 19 of the alarm circuit 20. The alarm circuit 20 preferably contains the electromagnet 21 of an electromagnetic bell apparatus. The armature 22, pulled by spring 23, against contact 24, carries the hammer 25, which operates in the usual manner to ring the gong, 26. Suitable means are provided for energizing the alarm circuit, and I preferably utilize the battery 15 common to all the circuits, for this purpose.

In accordance with my invention, I provide means for continuing the actuation of the alarm when the circuit at the circuit closer is opened. This means may be widely

varied. In the best embodiment of the invention it includes means for locking the armature 17 in the position, which, closes the alarm circuit. As illustrated, I make use of an electromagnet 27 with coil 28, which acts as the locking electromagnet to effect this result. In order to simplify the construction, I wind the coil 28 on the same magnetic core of soft iron on which is wound coil 16. This core may be straight or U shaped. It will be observed that when the relay magnet 16 is energized, the armature 17 will be attracted, which will also close the contact 29 of the locking circuit 30 containing the locking electromagnet 28. The contact 19 of the alarm circuit will therefore remain closed until the locking circuit is opened, even though the circuit is opened at the circuit closer 7, 8.

Suitable means are provided for opening the locking circuit, which will stop the ringing of the alarm. These means are under the control of the owner of the safety chest, but are not accessible to the burglar or sneak thief. In the best embodiment of the invention, I provide a contact 31 which is adapted to connect the points 32, 33 of the locking circuit, and to interrupt the connection between the points when desired. The means for actuating the contact 31 are inside of the chest, so that they cannot be tampered with, and the contact is preferably carried on the door of the chest, as illustrated. When the door is opened by unlocking the chest, the locking circuit and the bell circuit are opened, and the bell stops ringing.

In order to provide for carrying around the chest without ringing the alarm, by tilting the chest and closing the circuit at the circuit closer 7, 8, I preferably arrange a circuit closing switch 34 in the circuit 14. This switch is located within the chest so that it can only be reached, after the door has been opened by the owner. The armature 17 may be blocked away from its circuit closing position, and effect the same result.

In order to further protect the contents of the chest from unauthorized drilling, I make use of an auxiliary circuit closer located in the walls of the jewel chest. As illustrated upon the drawings, the auxiliary circuit closer operates in coöperation with the liquid circuit closer to protect the chest under all conditions. It consists of a plurality of conducting plates 35, 36, 37, 38 separated by insulating material 39, 40, 41 and 42 between which plates the ribbed or corrugated sheet metal framework may be included. The plates 35, 38 and corrugated sheet metal 43 are preferably connected by a wire to one terminal of the gravity operated circuit closer and the plates 36, 37 are preferably connected to the other terminal of the circuit closer. When a metal drill is used to penetrate the walls of the chest, it will short-circuit the plates and actuate the alarm and locking relay in a manner that will be well understood.

The operation of the invention will be clear from the preceding description of its construction. When the chest is tilted, the gravity operated circuit closer closes the circuit 14 momentarily, which throws in the alarm circuit, which latter is locked closed until the door is opened. The auxiliary circuit closer will cause a continuous ringing of the alarm if a drill is used to bore through the walls of the chest.

Having thus described my invention, it will be obvious that many changes may be made in carrying it into effect without departing from the principle thereof.

Claims:

1. The combination of a safety chest and parts located entirely within said chest comprising a gravity circuit closer having a movable terminal and a fixed terminal, symmetrically disposed with relation to the movable terminal, the contacting parts of said terminals being equidistant, said circuit closer closing an electrical circuit when the chest is jarred or tilted in any direction, an alarm, means controlled by said circuit closer for actuating said alarm and electrical means for continuing the actuation of said alarm when the circuit at the circuit closer is opened.

2. In a safety chest, the combination of a chest and parts entirely contained therein, the same comprising a gravity-operated circuit-closer adapted to close a circuit when the chest is jarred or tilted in any direction, said circuit-closer having a rigid and a liquid terminal, a cup containing the liquid terminal, the rigid terminal being disposed over the surface of the liquid terminal and being of such horizontal extent as to be contacted by the liquid terminal when the chest is jarred or tilted in any direction, an alarm, means controlled by said circuit-closer for actuating said alarm, and means for continuing the actuation of said alarm when the circuit at the circuit-closer is opened.

3. In a safety chest, the combination of a chest and parts entirely contained therein, the same comprising a gravity-operated circuit-closer adapted to close a circuit when the chest is jarred or tilted in any direction, said circuit-closer having an adjustable, rigid terminal and a mercury terminal, a cup containing the mercury terminal, the rigid terminal being disposed over the surface of the mercury terminal with all its portions equidistant therefrom and being of such horizontal extent as to be contacted by the mercury terminal when the chest is jarred or tilted in any direction, an alarm, means controlled by said circuit-closer for

actuating said alarm, and means for continuing the actuation of said alarm when the circuit at the circuit-closer is opened.

4. In a safety chest, the combination with the chest of parts located entirely therein and comprising an unstable circuit closer, an electrical control circuit closed thereby when the chest is disturbed, an alarm, an alarm circuit, a relay whereby the control circuit closes said alarm circuit, and a locking circuit adapted to be closed by the relay and having means for holding the relay closed after the control circuit has been opened at the said unstable circuit closer.

5. In a safety chest, the combination with the chest of parts located entirely therein and comprising an unstable circuit closer, an electrical control circuit closed thereby when the chest is disturbed, an alarm and an alarm circuit, a battery for supplying said circuits with current, and a locking relay energized in the first instance by said control circuit to close the alarm circuit and hold the same closed after the control circuit has been opened at the said unstable circuit closer.

6. In a safety chest, the combination with the chest of parts located entirely therein and comprising an unstable circuit closer, an electrical control circuit closed thereby when the chest is disturbed, an alarm, an alarm circuit, a relay whereby the control circuit closes said alarm circuit, a locking circuit adapted to be closed by the relay and having means for holding the relay closed after the control circuit has been opened at the said unstable circuit closer, a contact in said locking circuit, and means inside of said chest and controllable by an authorized person for actuating said contact to open said locking circuit.

7. In a safety chest the combination of parts located within the chest comprising a gravity operated circuit closer, an electrical circuit closed thereby when the chest is jarred or tilted in any direction, an alarm, an electrical circuit including a battery to actuate the alarm, a relay for closing the alarm circuit and an electro-magnet adapted to be energized by both circuits for locking the armature of the relay to continue the actuation of the alarm after the circuit is opened at the gravity circuit closer, the alarm circuit thus constituting a locking circuit and a contact arranged to make and break said locking circuit, said contact being carried by the door of the chest.

8. In a safety chest, the combination of a chest and parts entirely contained therein, the same comprising a freely movable gravity-operated circuit-closer, said circuit-closer having a rigid and a liquid terminal, a cup containing the liquid terminal, the rigid terminal being disposed over the surface of the liquid terminal and being of such horizontal extent as to be contacted by the liquid terminal when the chest is jarred or tilted in any direction, an alarm, means controlled by said circuit-closer for actuating said alarm, means for continuing the actuation of said alarm when the circuit at the circuit-closer is opened, and means also located entirely within said chest for discontinuing the actuation of the alarm.

9. In a safety chest, the combination of a chest and parts entirely contained therein, the same comprising a freely movable gravity-operated circuit-closer, said circuit-closer having a rigid and a liquid terminal, a cup containing the liquid terminal, the rigid terminal being disposed over the surface of the liquid terminal and being of such horizontal extent as to be contacted by the liquid terminal when the chest is jarred or tilted in any direction, an alarm, means controlled by said circuit-closer for actuating said alarm, means for continuing the actuation of said alarm when the circuit at the circuit-closer is opened, means also located entirely within said chest for discontinuing the actuation of the alarm, and a door provided with locking means for rendering said parts inaccessible to unauthorized persons.

10. In a safety chest, the combination of a chest and parts entirely contained therein, the same comprising a freely movable gravity-operated circuit-closer, said circuit-closer having a rigid and a liquid terminal, a cup containing the liquid terminal, the rigid terminal being disposed over the surface of the liquid terminal and being of such horizontal extent as to be contacted by the liquid terminal when the chest is jarred or tilted in any direction, an alarm, means for actuating the alarm controlled by the circuit-closer, and means for discontinuing the actuation of the alarm located within said chest.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MALCOLM E. LAUNBRANCH.

Witnesses:

D. C. TANNER,

A. H. MOORE.