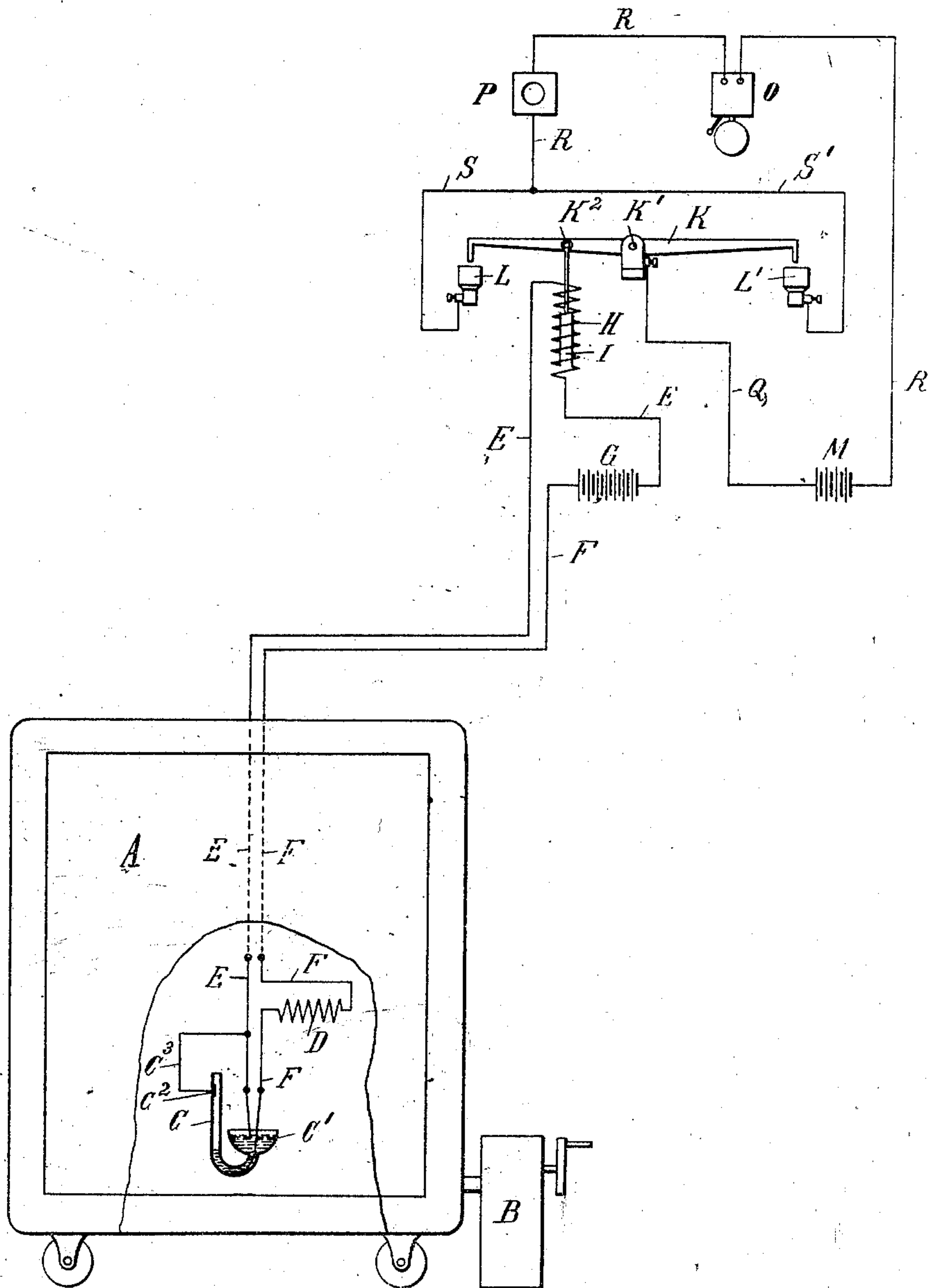


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H. R. CASSEL.
BURGLAR ALARM FOR SAFES.
APPLICATION FILED MAY 3, 1902.

NO MODEL.



Witnesses:
Arthur Quincy
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UNITED STATES PATENT OFFICE.

HENRY R. CASSEL, OF LONDON, ENGLAND.

BURGLAR-ALARM FOR SAFES.

SPECIFICATION forming part of Letters Patent No. 749,842, dated January 19, 1904.

Application filed May 3, 1902. Serial No. 105,741. (No model.)

To all whom it may concern:

Be it known that I, HENRY RENNER CASSEL, a citizen of the United States of America, residing at London, England, have invented certain new and useful Improvements in Burglar-Alarms for Safes, of which the following is a specification.

My invention relates to a burglar-alarm for safes, vaults, or strong rooms, hereinafter comprehensively referred to as "safes." The safes must be rendered air-tight, so that the air within the chamber of the safe may be compressed or exhausted, as desired, thereby creating a pressure in the safe different from that in the surrounding atmosphere.

I place inside the chamber of the safe a mercury pressure-gage and two wires of an electrical circuit. In this circuit is a resistance-coil and a solenoid or electromagnet with an iron core suspended from a balance-beam. As long as the normal current is flowing through this circuit the magnetized core retains the balance-beam in its mean position; but when the strength of the current deviates from the normal or is cut off through the breaking of the circuit the core rises or falls, and one end of the balance-beam dips into a cup containing mercury and completes another circuit, which causes an alarm-bell to ring and actuates an indicator to denote which safe has been tampered with. The making and breaking of one circuit is thus controlled by another circuit. The alarm apparatus may be placed at a central station distant from the safe or at any other desired point.

The accompanying drawing represents a safe provided with my improved burglar-alarm.

A is a safe furnished with an air-pump B and a barometer-tube C, containing mercury. The said tube may be of any suitable form. Into the open end C' of the tube C extend two wires E F in such manner that the wire F extends to the bottom of tube C and is submerged, while the wire E is shorter and does not dip into the mercury under normal atmospheric pressure. The wire F is connected to a resistance D, also placed within the safe. Both wires pass out of the safe through an opening, which is made air-tight. Wire F is connected to one pole of a battery or source of current G. With-

in the circuit of wire E, which is connected to the other pole of battery G, a solenoid H, having a core I, is arranged. The core I is suspended at K² from a metallic balance-beam K, pivoted at K'. The ends of the beam are bent downward and are adapted to dip into either one of two mercury-cups L L' when the beam K is tilted. A wire Q connects the pivot K' of beam K to one pole of a second battery or source of current M, and a wire R, connected to the other pole of said battery, leads to an alarm-bell O and an indicator P. The wire R then branches into two wires S and S', which lead, respectively, to the cup L and the cup L'. When the safe is closed and the air exhausted by the pump B, the mercury at C' will rise and make contact with the terminal of wire E, so that a main circuit is closed in the following manner: The current passes from battery G through wire E, solenoid H, wire E, mercury at C', wire F, resistance D, wire F, back to battery G. This normal current will cause the core I of solenoid H to rise to such a height that it will maintain the balance-beam in its horizontal position. Consequently the balance-beam will be out of contact with both of the cups L L'. If now the safe is tampered with, so as to admit air therein, the pressure becomes normal, whereupon the mercury at C' drops back into its former position, thus breaking the contact at C' and demagnetizing the solenoid H. The core then drops and pulls down the beam K, thus making contact through the cup L and completing the second circuit, which causes the bell O and the indicator P to operate. In this case the current passes from battery M, through wire R, alarm-bell O, wire R, indicator P, wires R and S, cup L, balance-beam K, pivot K', and wire Q back to battery M. It will readily be understood that the same action takes place when either one or both of the wires E F have been cut or when the current decreases. An attempt to short-circuit the wires or to connect them with another battery is also immediately detected, because the strength of the current determined by the resistance D retains the core I in a prearranged position, and any increase of the current in the main circuit above the normal strength causes the core to

rise, and thus to make contact at L'. This will effect the closing of a circuit that also causes the bell O and the indicator P to operate. This circuit is closed in the following manner: The current passes from battery M, through wire R, alarm-bell O, wire R, indicator P, wires R and S', cup L', balance-beam K, pivot K', and wire Q back to battery M. If it be desired to work by compressed air in the safe instead of by rarefied air, the wire E is connected with a platinum contact C², burned into the tube C at a suitable height. By forcing air into the safe the pressure causes the mercury to rise in the long leg of the tube C until the main circuit is completed at C².

Instead of employing a balance-beam K, a galvanometer may be used, the circuit being closed through its needle and a movable fork whenever any tampering with the safe or with the main circuit is attempted, or other known indicating devices may be employed.

Any barometer-tube or manometer in which the level of the mercury is altered by pressure can be employed in lieu of the barometer-tube C or any other mechanical device capable of recording pressure—for instance, an aneroid-box.

Any desired number of safes may be connected with the main battery or other source of electricity and a central station where the alarm apparatus is placed, proper connection being made with the indicators to show which safe is being tampered with.

Instead of alarm-bells, glow-lamps or other suitable devices may be employed to raise an alarm or to attract attention when the safe is interfered with.

I claim—

In a burglar-alarm for safes, the combination of an air-tight safe with means for altering the pressure of the inclosed air, a main circuit having a contact influenced by the air-pressure, a resistance and solenoid in said main circuit, a beam influenced by the solenoid, two secondary circuits having contacts opposite the beam ends, and an alarm in both of said secondary circuits, substantially as specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY R. CASSEL.

Witnesses:

WALTER J. SKERTEN,
GEO. J. B. FRANKLIN.