Feb. 27, 1940. J. LEMIRE 2,191,926

BURGLAR ALARM

Filed May 26, 1938 2 Sheets-Sheet 1

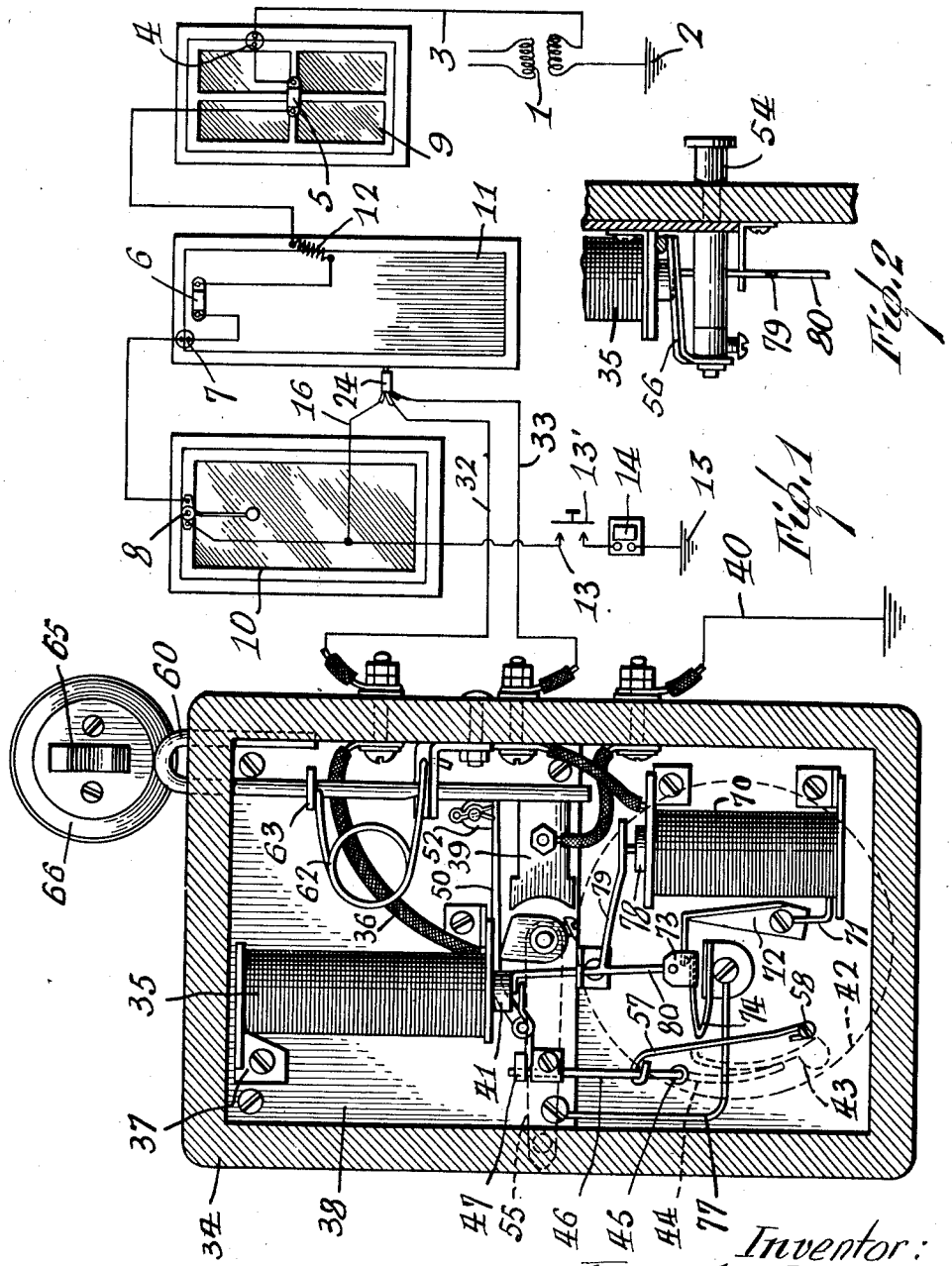


Fig. 2

Fig. 1

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BURGLAR ALARM

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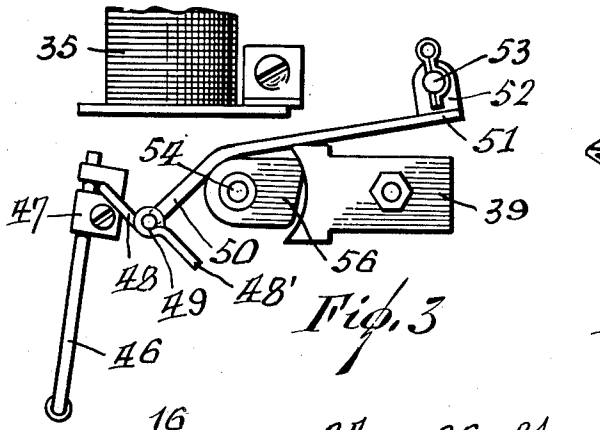


Fig. 3

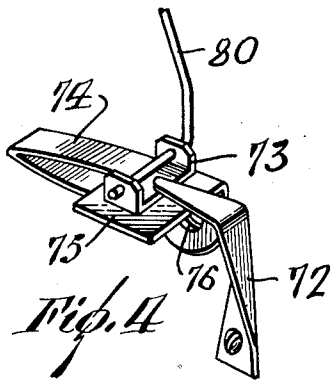


Fig. 4

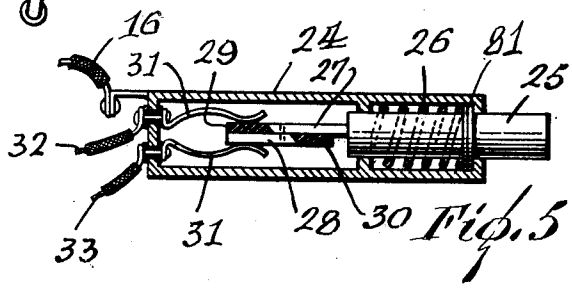


Fig. 5

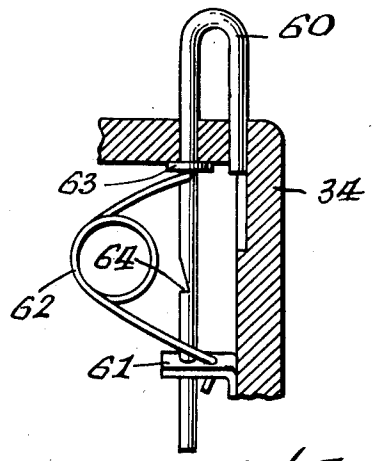


Fig. 7

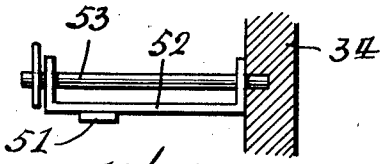


Fig. 6

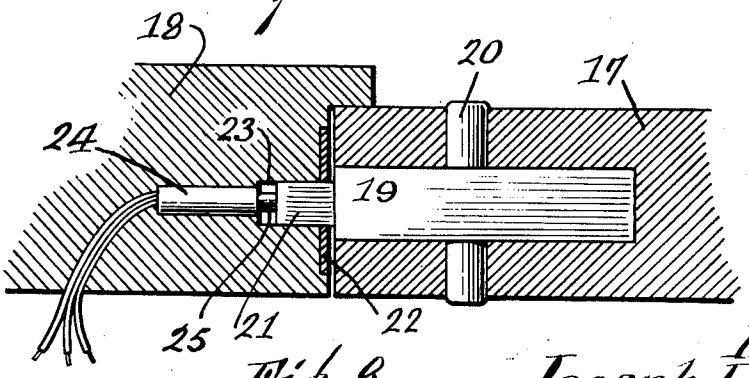


Fig. 8

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UNITED STATES PATENT OFFICE

2,191,926

BURGLAR ALARM

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Application May 26, 1938, Serial No. 210,219

2 Claims. (Cl. 177—314)

The present invention pertains to a novel burglar alarm operable by switches so mounted with respect to a structure as to be altered when forcible entry is attempted. These switches are preferably mounted on doors or windows or parts adjacent thereto and are so constructed as to vibrate instantaneously with the first vibration, thereby affecting a circuit governing an alarm.

The alarm mechanism in the present instance is in the nature of a gong prepared to operate but normally locked against operation. There is also included a solenoid having a plunger adapted to fall by gravity to release the lock, preferably through the action of a tripping device. When set for the night, the solenoid is energized through a circuit including the above mentioned switch, so that its plunger is held inoperative insofar as the tripping mechanism is concerned. When the circuit is opened by interference with any one of the aforementioned switches, the plunger drops on de-energization of the solenoid and thereby releases the alarm lock through the tripping mechanism.

The invention also includes an automatic mechanism for setting the alarm against operation during the day when the aforementioned switches are repeatedly opened and closed. This mechanism supports the plunger by positive means and prevents it from falling against the tripping mechanism. The device is operated through another solenoid which is energized when the entrance door is unlocked by means of its key. Further, this mechanism is so constructed as to break the circuit of the second solenoid as soon as the plunger of the first solenoid is supported, so that a minimum of current is consumed in the second solenid.

Also included in the invention is a positive manual means for locking the tripping mechanism against operation when desired.

The invention is fully disclosed by way of example in the following description and in the accompanying drawings, in which

Figure 1 is a section of the alarm mechanism, showing also a diagram of the wiring;

Figure 2 is a detail section of the device;

Figure 3 is another detail showing a different adjustment of the trip mechanism;

Figure 4 is a perspective view of the automatic switch for the second solenoid;

Figure 5 is a longitudinal section of the lock switch;

Figure 6 is a detail section in a plane perpendicular to that of Figure 3;

Figure 7 is a detail section in the same plane as Figure 1, showing a different position of certain parts, and

Figure 8 is a section of the door lock.

Reference to these views will now be made by use of like characters that are employed to designate corresponding parts throughout.

In Figure 1 is shown a transformer 1 having one side grounded at 2 and a conductor 3 extending from the other side. This conductor passes through several vibratory switches carried by door or window frames or parts adjacent thereto, as shown in co-pending application, Serial No. 210,218, filed May 26, 1938. Such devices are designated at 4, 5, 6, 7 and 8 carried by windows 9 and 10 and a door 11. Also inserted in the conductor 3 is a spring or flexible conductor 12 at the hinged edge of the door to permit swinging. The conductor 3 also passes through a push button switch 13, a buzzer 14, and is finally grounded at 15 for a purpose that will presently be described.

A branch 16 is extended from the conductor 3 to a contact device operated by the bolt of a door as shown more clearly in Figures 5 and 8. This will now be described.

The door carrying the device is indicated at 17 in Figure 8 and swings in a frame 18. The door carries a lock 19 with cylinders 20 operable from either side. The bolt 21 operable from the cylinders passes through the usual metal plate 22 at the edge of the frame and into a cavity 23. A cylinder 24 is mounted in the frame and has a plunger 25 acted upon by a spring 26 so that the plunger is normally projected to the cavity 23 where it is engageable by the bolt 21. The inner end of the plunger 25 is extended in the form of a pair of conducting plates 27, 28, the former having an insulated outer end 29, and the latter having an insulated inner end 30, the conducting portions overlapping each other at the center, for a purpose presently to be described. These plates are adapted to enter between and engage a pair of spring contacts 31 fastened to the casing 24. The latter are connected respectively to conductors 32 and 33. It may now be seen that contact is established between members 31 only when engaged by the overlapping parts of plates 27, 28.

A suitably positioned housing 34 (Fig. 1) contains a magnetic coil 35, one end of which is connected through a conductor 36 to the conductor 32. The other end of the coil is connected at 37 to a copper plate 38 within the housing 34, and is grounded from the plate through a member 39 and a conductor 40.

The object of push button switch 13 with its movable member 13' is to ascertain if current is flowing from the transformer through the several vibratory switches. When the test is made by pushing the member 13', the buzzer 14 will sound, thereby indicating that the circuit is in order. At the same time, a circuit is maintained through coil 35, holding its plunger 41 in an elevated position. If a forcible entry is attempted, one of the vibratory switches is opened, breaking the coil circuit and causing the plunger 41 to drop and set an alarm in operation, as will now be described.

The alarm consists of a gong 42 mounted outside of the casing 34. The gong is spring wound and spring actuated by well known means not here illustrated and is associated with a hammer 43 prepared to strike the gong when the device is wound up. Action of the hammer is inhibited when the hammer is engaged by a curved lever 44 entering the casing at 45 and having a portion 46 extending upwardly within the casing. This portion carries a slotted collar 47 (Fig. 3) in which is received the bent end of a wire 48. The center of the wire is coiled to form an eye 49 to receive one end of the bent arm 50. The other extremity 51 of the arm is secured to a U-shaped pivotal member 52 (Fig. 6) mounted on a pin 53 extending from the housing 34.

Through a wall of the housing 34 is passed a shaft 54 carrying at its outer end an operating arm 55 (Fig. 2) and at its inner end a curved cam member 56. When this member is turned in the upward position as in Figure 1, it raises members 48 and 50 (being in engagement with the latter) and moves the arm 46 to the left. The parts are so constructed and weighted that they will maintain this position even when the member 56 is returned to the position shown in Figure 1. In the adjustment of the arm 46 as shown in Figure 1, the hammer 43 cannot operate on the gong 42. It should be added also that Figure 1 illustrated the stay position, that is, when the device is not to be operated.

Referring now to the service or night adjustment determined by turning the member 56 to the position shown in Figure 3, it will be evident that the plunger 41 will drop whenever the circuit is interrupted at any of the contacts 4, 5, 6, 7 and 8, although the parts 46 and 48 remain in the position shown in Figure 1. In this position the free extremity 48' of member 48 is immediately below the plunger 41, to be engaged thereby and to be moved to the position shown in Figure 3 when thus engaged. In this position the arm 46 releases the hammer 43 for active operation. The arm 46 is pulled by spring 57 fixed at 58 to the casing 34. The gong will continue to sound until its spring has been fully unwound, even though the broken contact be restored, since the return of the plunger 41 does not return the arm 47 to hammer-locking position, which can be done only by manually turning the cam 56 through its operating lever 55.

An inverted U-shaped wire 60 is mounted for vertical movement in the casing 34 as shown in Figures 1 and 7. One side of this member passes through a bracket 61 on the housing. The ends of a coil spring 62 engage this bracket as a collar 63 on the wire, tending to move the wire upward. The wire has a notch 64 normally engaging the bracket to hold the spring under tension.

As the member 51 drops under the action of the plunger 41 as above described, the edge of member 52 pushes the member 60 sufficiently in a lateral direction to disengage the notch 64 from the bracket 61, whereupon the member 60 moves upward. The resiliency of the member 60 at its bend suffices to permit this displacement. The bend being external of the housing, strikes the push button 65 of the switch 66 (Fig. 1). This switch is adapted to operate some other alarm and to light the lamps in the building.

The daytime adjustment is made when the lock 19 is opened by turning the key in either cylinder 20. The bolt 21 is drawn into the lock, whereupon the plunger 25 is projected to the position shown in Figure 5. In this movement, the contacts 31 momentarily pass current when the overlapping parts of the conducting portions of the plates 27, 28 pass between them in order to prevent plunger 41' from dropping. At this moment, current flows from conductor 32 (which is always electrically connected to conductor 16) to conductor 33. It will be understood that the casing 24 is grounded. Current flows from conductor 33 to another coil 70 in casing 34 and from the coil through a conductor 71 to a contact 72. The latter is adapted to engage a U-shaped member 73 (Fig. 4) to which is attached a spring member 74 terminating in a lug 75 secured to the casing from the attaching screw 76 for the largest extending conductor 77 to the grounded plate 38. Thus, the completion of the circuit through coil 70 depends on engagement of members 72 and 73.

The closed circuit causes the plunger 78 of coil 70 to rise and strike a lever 79. To the latter is secured a vertical arm 80 having its upper end set beneath the plunger 41 as shown in Figure 1. This bent end prevents the plunger from striking the member 48' and operating the alarm.

As soon as the current through conductor 16 and 33 is interrupted, the weight of plunger 41 on the bent upper end of arm 80 will depress the arm to the extent permitted by the retraction of plunger 78 in the deenergized coil 70. The weight of plunger 41 transmitted through arm 80 separates contact 73 from contact 72, since contact 73 is carried by arm 80 as shown in Figure 4. This action breaks the circuit through coil 70 after it has performed its purpose and thus effects an economy in current consumption.

In opening the circuit of coil 35 at the switches 4, 5, 6, 7 and 8 by the normal opening and closing of the doors and windows during the day, the alarm does not operate by reason of the member 80 holding plunger 41 from falling on member 48'. Cam 56 is used only when it is desired to stop the apparatus from operating or to prevent the bell from ringing.

The plunger 25 is in two parts at collars 81 so that the mechanism with casing 24 is not disturbed if a burglar tampers with the lock.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention, as indicated by the appended claims.

What I claim is:

1. In an alarm, an audible signal, means tending to operate said signal, a lock restraining said means, a solenoid having a plunger adapted to trip said lock, a circuit through said solenoid and normally maintaining said plunger in an ineffective position, and a control switch in said circuit and adapted to release said plunger for operation, another solenoid having a plunger, a device operable by said plunger to hold the first

plunger in inoperative position with respect to said lock.

2. In an alarm, an audible signal, means tending to operate said signal, a lock restraining said means, a solenoid having a plunger adapted to trip said lock, a circuit through said solenoid and normally maintaining said plunger in an ineffective position, and a control switch in said circuit and adapted to release said plunger for operation, another solenoid having a plunger, a device operable by said plunger to hold the first plunger in inoperative position with respect to said lock, and means operable by said device for opening the circuit of the second named solenoid.

JOSEPH LEMIRE.