Jan. 17, 1967 C. LOMBARDI 3,299,229

BURGLAR PROOF SAFETY LOCK WITH CAMS THAT BLOCK THE BOLT AND ELECTRIC ALARM DEVICES

Filed March 12, 1964

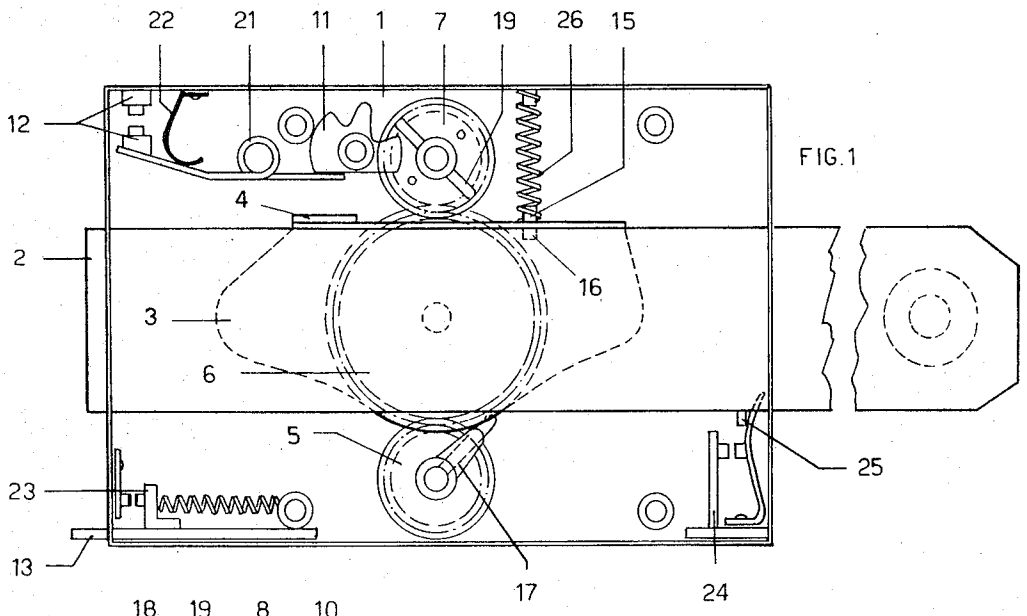


FIG. 1

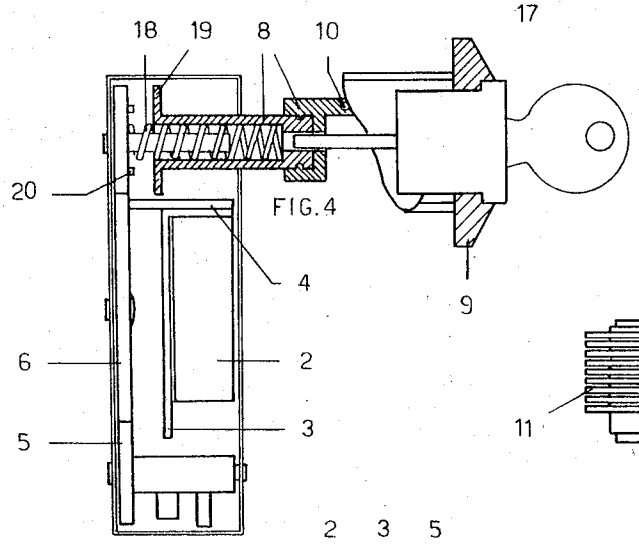


FIG. 4

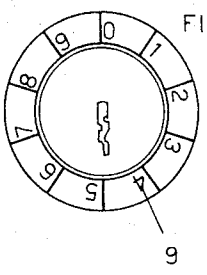


FIG. 5

FIG. 3

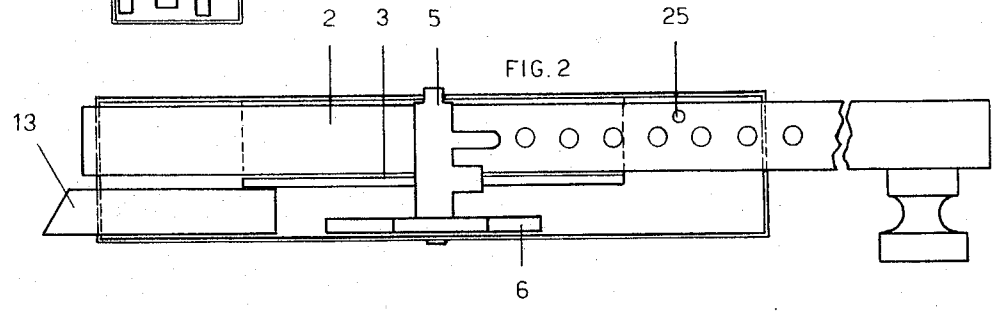


FIG. 2

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United States Patent Office 3,299,229 Patented Jan. 17, 1967

3,299,229

BURGLAR PROOF SAFETY LOCK WITH CAMS THAT BLOCK THE BOLT AND ELECTRIC ALARM DEVICES

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Filed Mar. 12, 1964, Ser. No. 351,349
8 Claims. (Cl. 200—44)

Locks currently in use lend themselves to being opened with false keys or by other means, including the opening of the door by taking it off its hinges. The object of this invention is to prevent burglary not only by means of false keys but also through the forcing of the door. The system, as described below, can be applied to any type of lock in use today. The lock constituting the subject of the present invention is different from currently used locks in that, on the outside of the door, in addition to the usual external plate where the key is inserted, there is a numbered, turning dial in the center of which the plate is located. Setting the dial at 0 (zero) and turning the key, the bolt is made to slide and the lock closes normally, but subsequently setting the dial on one or more numbers and turning the key for each figure which has been composed a block of the knife lever is effected and consequently of the bolt through cams located above the knife lever which are made to rotate by a rod attached to the numbered dial. The device is also equipped with three electric contacts so that, in the event of efforts to open the door, even with the original key, without having reformed the numbers set when closing, or taking the door off its hinges, not only does the lock remain closed but it also sets off alarm signals (bells, sirens, etc.) since, when the numbers are wrong, the cam turning in the reverse sense, closes the circuit. In the event that the door is forced, another contact switch starts off the alarm system. In the event that the door or the lock have been tampered with, after reforming the numbers set when closing, the cams return automatically to the normal position, freeing the bolt and making the alarm system stop.

This apparatus could be completed, in addition to the alarm device in the janitor's quarters and linked to all the tenants' doors, by a small radio transmitter with a wave length connected to the nearest police station, so that in the event of attempted burglary a number would light up on a board located in the police station. It is understood that the board in question would have as many numbers as there were streets under the jurisdiction of the police precinct and each number would correspond to a given street.

In the annexed drawings the component parts of the safety lock according to the invention are illustrated by way of example:

FIG. 1 shows the entire lock without the cover. It shows the arrangement of the cams **11** placed above the fin **4** of the knife lever **3** and the position of the two platinum plated points **12** of the alarm switch which, when the lock is open interrupts the entry of the current into the lock.

FIG. 2 shows the lock seen from its lower part; it shows the position of the gear **5** placed below the knife lever **3** and the profile of the catch that controls the contact **13**.

FIG. 3 shows the cams in section.

FIG. 4 is a view in section of the lock coupled to the external plate with the numbered turning dial **9**; the rod **8** which operates inside the lock has a rotary and longitudinal movement and it has another articulated section which only moves longitudinally and outside the lock and ends with a pin **10**, which being connected to the numbered turning dial is pushed by it upwards or downwards while the rotary movement of the section inside of the lock is started by the tongue coming out of the external plate where the key is inserted.

FIG. 5 shows the numbered turning dial seen from the front.

Naturally the shape and the constructive details can be varied according to the requirements for practical application and still be covered by the claims of this invention.

Description

The lock of the present invention may have different shapes and sizes. It consists of a metal plate box **1**, a sliding bolt **2**, a knife lever **3** the upper part of which is bent angularly. At that portion of the lever two pins **15** and **16** are fixed. The pin **15** serves as a spring guide, to press a spring **26** which makes the knife lever adhere to the frame of the bolt and the second pin **16** to block the bolt at every turn of the key. On the same plane on the side opposite the pin **15** there is a fin **4** as deep as the box, forming a T with the knife lever. The lower part of the knife lever is profiled so that the key, turning in the lock, causes the rotation of an axle fixed on the gear **5**; the axle is provided with a pivot and a cam **17** so that while the cam raises the knife lever, the pivot, entering into the openings on the lower side of the bolt, makes it slide.

The movement is transmitted to the gear **5**, through an intermediate gear **6**, by another little gear wheel **7** which is located above in the center, above the frame of the knife lever **3** and on a plane below it; this is controlled by a rod **8** connected to the external key plate and the numbered turning dial **9** and in the center of the gear wheel **7** a guide pin is fixed on which slides the rod **8**. On the plane of the aforementioned gear wheel there are two pins with which the two catches of the rod **8** engage. The rod **8** which runs over the said pin is bored along the entire section that operates inside the lock; in the bored aperture is lodged a spring **18** which forces the rod towards the cover of the lock. At one of the ends of the rod are two catches **19** which, when the rod is pushed down by the numbered dial **9** engages with the two pins **20** located in the plane of the gear wheel **7**. At the point where it comes out of the box, the section that is not bored, there is a rectangular slot which engages the tongue that comes out of the key plate. In the external part of the slot on the same height there is a groove which engages the articulated further part of the rod **8**. Therefore the section of the rod in the inside of the lock has a rotary movement imparted to it by the turning of the key and a longitudinal movement from the numbered dial **9**. The continuation of the rod, being articulated, moves only in a longitudinal direction controlled by the dial **9** through a pin **10**. The pin is lodged in, and guided by a slot in the external plate.

The numbered dial **9** is shaped like a mushroom the stem of which the part which is built into the door has a helicoidal end where the pin **10** is fixed on the rod **8** so that when the numbered dial is turned, the rod **8** is caused to slide. When setting the dial on 0 (zero), the catches **19** of the rod are fixed between the two pins **20** located in the plane of the gear wheel **7** and the key in turning makes the wheel turn and through the intermediary gear, transmits the movement to the gear **5** which makes the cam **17** turn and the pin fixed on the axle of the wheel and while the cam raises the knife lever, the pin or pivot causes the bolt to slide, opening or closing the lock. Setting the numbered dial on any of the numbers, and groups of several figures can be formed, the rod **8** is in a position in which its catches **19** coincide with the cams **11** corresponding to the number formed, so that when the key is turned the catches **19** cause the rotation of the cam which is lo-

cated on the upper part of the fin 4 blocking any movement on the part of the knife lever. The cams 11 shaped like a disk cut a little below the middle with a hole in the center and two teeth on the part facing the rod 8 turn on a fixed pin situated above the side of the gear wheel 7 above the frame of the knife lever; on the other side, a metal band 21 is pivoted on a small pin; the height of the band is equal to that of the cams placed one above the other against which one side of the band is kept in contact by a spring 22. On the other side the band in question has a platinum plated point, thus forming the switch 12. In the normal position the contacts are disconnected. When attempts are made to open the lock with its key without having reformed the numbers set at the moment of closing, the cams 11 turn in the opposite direction (corresponding to the erroneous numbers, or if no number has been formed) and, making the band turn, bring the two points into contact thus starting off the alarm system, still without freeing the knife lever and opening the lock. In order to make the bolt slide (opening the lock) the numbers set when closing must be reformed and then the dial moved to zero; then the cams return automatically to the normal position, even if the lock has been tampered with; another switch is formed by a catch 13 which may have different shapes. The one illustrated is an iron band with an obliquely cut section projecting from the lock while the section running inside the lock has a platinum plated point so that when the door is open and the catch is pushed forward by a spring, it contacts another platinum plated point of a switch 23 fixed on the casing or box of the lock, closing the circuit and starting off the alarm system only if the door is opened by abnormal means and the lock is in the closed position. With the lock open, i.e. with the bolt fully drawn back, the switch 23 although keeping the circuit closed, does not set off the alarm system, provided that the door is opened normally with the key, since a third switch located on the inside of the lock box or casing, under the bolt on the opposite side from the catch 13 is formed by a fixed platinum plated point 24 and a spring does not allow the current to enter the circuit of the lock since a pin 25 located on the frame below the bolt separates the two points when the bolt is completely pulled back; advancing the bolt for closing, the points come into contact connecting the electric current in the circuit.

Electric circuit

One of the wires from the intake tap or socket connects with the breaker point of the switch 14 continuing over the fixed one and then on to the switch 13 and 12. The outlet wire, starting from contact 12 and passing over 13 finally connects with the alarm system.

What I claim is:

1. A safety lock, comprising a case, a bolt slidable in said case, a movable mushroom-shaped dial having a stem portion extending into said case and an outer indicia-carrying portion, a key plate enclosed by said outer portion, a knife lever having a bent portion extending adjacent said bolt and adapted to engage said bolt, a plurality of cams, the number of said cams corresponding to that of said indicia, electric switches actuated by said cams, and means connected with said key plate for actuating said knife lever and for actuating said cams.

2. A safety lock in accordance with claim 1 for use with a door frame, comprising a catch slidably mounted in said case and having an outer inclined surface adapted to engage the door frame and cause an inward movement of the catch, a spring engaging said catch and tending to move it outwardly, a contact carried by said catch, another contact carried by said case, the first-mentioned contact being adapted to engage the second-mentioned contact when said catch is moved outwardly, said two contacts being connected with said electric alarm devices.

3. A safety lock in accordance with claim 1 for use with a door frame, comprising a catch slidably mounted in said case and having an outer inclined surface adapted to engage the door frame and cause an inward movement of the catch, a spring engaging said catch and tending to move it outwardly, a contact carried by said catch, another contact carried by said case, the first-mentioned contact being adapted to engage the second-mentioned contact when said catch is moved outwardly, said two contacts being connected with said electric alarm devices, a switch located within said case and operatively connected with said two contacts, said switch having a fixed contact and a resilient contact adapted to engage the last-mentioned fixed contact, and a pin carried by said bolt and adapted to engage the last-mentioned resilient contact to move it away from the last-mentioned fixed contact.

4. A safety lock in accordance with claim 1, comprising a pin connected to the bent portion of said knife lever, a spring connected to said pin and pressing said knife lever against said bolt, another pin connected to said knife lever and engaging said bolt, and a fin located within said case and engaging said knife lever, said knife lever being profiled, said means comprising an axle, a cam carried by said axle and adapted to engage said knife lever, a gear fixed upon said axle, an intermediate gear wheel meshing with said gear, another gear wheel meshing with said intermediate gear wheel and means adapted to connect said key plate with the last-mentioned gear wheel.

5. A safety lock in accordance with claim 4, wherein the last-mentioned cam is adapted to raise said knife lever, the first-mentioned means further comprising a pin carried by said axle and adapted to engage any one of a plurality of holes formed in said bolt to cause a sliding of said bolt.

6. A safety lock in accordance with claim 4, wherein the last-mentioned means further comprise two pins carried by the last-mentioned gear wheel, a rotary rod, means connecting said rod with said key plate, catches carried by said rod and adapted to engage the last-mentioned pins, and an axle supporting said rod for longitudinal movement thereon.

7. A safety lock in accordance with claim 6, wherein said rod has a cylindrical portion located within said case and a slotted portion mounted upon said cylindrical portion, said key plate having a tongue fitting into the slot of said slotted portion, said dial having a helicoidal end portion, a pin carried by said rod and engaging said helicoidal end portion, and a spring located within the cylindrical portion of said rod and pressing it against said dial.

8. A safety lock in accordance with claim 6, wherein each of the first-mentioned cams comprises two teeth adapted to be engaged by said catches, each of said electric alarm devices comprising a metal band engaged by one of the first-mentioned cams, an electrical contact carried by said band and another electrical contact adapted to be engaged by the first-mentioned contact.

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