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COMPLETE SPECIFICATION

An Improved Door Lock

I, JACQUES FRANCOIS GABRIEL CHOBERT, a French Citizen, of 3, Avenue de la Liberation, St. Etienne, France, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to locks of the type that are mounted on the shutting edge of a door and are provided with an unbevelled spring bolt and remote bolts all of which are normally held retracted when the door is open but are automatically shot into their respective strike boxes when the door is slammed or pushed shut.

This slam action is usually operated by means of a small bevelled spring bolt which protrudes from the lock housing when the door is open. The small bevelled spring bolt is linked with the mechanism operating the unbevelled spring bolt and remote bolts in such a way that when the door is slammed the bevelled spring bolt strikes the strike box and is forced into the lock housing, releasing the unbevelled bolts so that they are urged, usually by means of a spring, into their respective strike boxes thus securing the door.

In most such locks the bolts are retracted again by means of a key on the outer side of the door and a handle on the inner side of the door. Such locks however suffer from the disadvantage that they can be forced either by end pressure applied to the protruding bolts or by breaking a panel of the door and retracting the bolts by means of the inner handle.

It is one object of the present invention to provide a door lock which, by the single act of slamming the door secures the door against forcing, either by application of end pressure to the bolts or by retraction of these bolts by means of the inner or outer handle.

According to the present invention there is provided a door lock for cooperat-

ing with a strike box, comprising a housing, a bolt plate slidable in the housing, a bolt mounted on the bolt plate for movement between a projected and retracted position, a spring for urging the bolt plate into the projected position, handles pivotally mounted on the housing, independently operable coupling members between each handle and the bolt plate for the retraction of the bolt plate, a catch for retaining the bolt plate in the retracted position, and two key operated latch plates one associated with each coupling member, each latch plate blocking the movement of its associated coupling member until released by a key, the latch plate returning to its blocking position as soon as the key is withdrawn from the lock, an actuator bolt which on striking the strike box is movable into the housing to release the catch holding the bolt plate so that the bolt may be shot into the strike box, and a spring actuated blocking pawl which prevents retraction of the bolt plate and can only be moved from its blocking position by operation of one of said handles which in turn can only retract the bolt plate and bolt when the latch plate associated therewith is released by the key.

In the accompanying diagrammatic drawings, which illustrate a preferred embodiment of the invention.

Figure 1 is a side elevation of a lock, a face plate of which has been removed.

Figure 2 is an end elevation of the same lock of which an end plate has been removed.

Figures 3 and 4 are details illustrating alternative catch devices associated with the lock.

Figure 5 is an end elevation of part of the mechanism for retracting the bolt of the lock, and

Figure 6 is a view illustrating a linkage for operating auxiliary lock bolts disposed around the shutting edge of a door.

Referring to the drawings, a lock

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adapted to be mounted on the vertical shutting edge of a door comprises a housing 10 in which a bolt plate 11, having lock bolts 12 integral with it, is mounted to slide on guide rods 13 and also on studs 14 on the back plate of the housing and engaged in slots 15 in the plate. The guide rods 13 are surrounded by coil springs 16 which urge the bolt plate 11 outwardly (i.e. to the left with respect to Figure 1) towards the vertical shutting edge of the door (not shown) so that the lock bolts 12 can protrude from the housing into a locking position in engagement with a strike box or plate (not shown) mounted on a door jamb.

The bolt plate 11 is movable to retract the bolts 12 by rotation of either of two handles 17a and 17b which are mounted respectively on the outside and inside faces of the door. Each of these handles can act independently on the plate 11 through coupling members 18a (Figure 5) and 18b (Figures 1 and 2) respectively which are arranged one on each side of the plate. These coupling members are provided with studs or pins 19a and 19b located within a slot 20 in the plate so that when the respective handle 17a or 17b is rotated against the action of spiral springs 21a or 21b (Figures 1 and 5 respectively) bearing against the respective coupling members, the associated stud 19a or 19b engages the rear face 22 of the slot 20 to thrust the plate 11 backwards and retract the bolts 12.

When the plate 11 arrives at its fully retracted position, a stud or boss 23 thereon is engaged by a catch 24 on one arm of a lever 25 mounted on a pivot 26. This catch is urged into its engaged position by a spiral spring 27 and is released to allow the bolts 12 to spring into their locking position by inward displacement of an actuator bolt 28 which has a bevelled end face, always protrudes from the housing 10 and is inwardly displaceable by engagement of the bevelled face with the strike box or plate as the door is closed.

As shown in Figure 3, the actuator bolt 28 is integral with an actuator plate 29 slidably secured in the housing by means of a pin-and-slot connection 30, movement of the bolt into the housing 10 being resisted by a spring 31 acting on a stud 32 on one side of the actuator plate. When this actuator plate has been displaced a predetermined amount, a cam 33 on its lower edge engages an arm 34 of the pivoted lever 25 which is thereupon rocked to release the catch.

In Figure 4, is illustrated an alternative arrangement in which the pivoted catch lever 25 is associated with a second

lever 35 which is pivotally mounted on the actuator plate 29 and is urged by a spring (not shown) to pivot in an anti-clockwise direction, movement being limited by a pin 36 on the plate 29. The coupling members 18a and 18b, when rotated by their respective handles to retract the bolts 12, engage an arm 37 of the lever 35 to rock it away from the catch lever 25 and permit the catch to engage the stud 23 on the plate 11. The spring is sufficiently strong to prevent the lever 35 from rotating when it engages the arm 34 of the catch lever 25 as the bolt 28 is displaced into the housing so that the catch lever is rocked and the bolt plate 11 released.

Latch plates 39a and 39b (Figures 1 and 5 respectively) are mounted on the outside and inside face plates respectively of the housing 10 in order to prevent rotation of the lock bolts 12 until released by a key. Each of these latch plates is vertically slidable on guide pins 40a and 40b and can drop downwards under its own weight to permit a projecting shoulder 41a, 41b, to engage an angular portion of the associated coupling member 18a or 18b when the lock bolts 12 are fully extended into the locking position. The members 18a, 18b cannot then be moved to retract the bolt until the appropriate latch plate has been lifted out of engagement therewith. This is effected by rotation of a key barrel 42a, 42b on which a crank pin 43a, 43b is mounted to engage a slot 44a, 44b in the latch plate 39a or 39b, it being possible to rotate the key barrels only when an appropriate key has been inserted therein. The barrels can, of course, be freed to rotate by actuation of a permutation device and the word "key" as used herein is to be understood as including such a device.

In order that the lock can be opened from the inside without the use of a key, the inner latch plate 39b is provided with a mechanism for holding the plate in its raised position when desired. This mechanism, which is of course only operable from inside the door when closed, comprises a lever 45 which is pivoted at 46 and is provided with a nose 47 spring urged towards the edge of the latch plate 39b. When the latch plate is in its uppermost position, a slot 48 is engaged by this nose to prevent the latch plate from descending until the nose is forced out of the slot by pressure on a pin 49 which protrudes from the edge of the housing and can be held depressed by a slide 50.

Retraction of the bolt plate 11 can also be prevented by a lever 51 mounted on a pivot 52 and urged by a feather spring 53

to engage behind the plate when it is fully extended in its locking position. As the coupling members 18a and 18b are rotated to retract the bolts, they thrust against a pin 54 extending out of both sides of the lever 51 and rock it out of engagement with the bolt plate 11.

The movement of the bolt plate 11 can also be utilised to operate additional bolts positioned around the edge of a door. As shown in Figure 6, for example, a bell crank lever 55 is pivoted about the lower fixed guide pin 14 of the slidable plate 11. A stud 56 on one arm of this bell crank lever is engaged in a vertical slot 57 in the bolt plate 11 while a second stud 58 on the other arm engages a horizontal slot 59 in a link 60. Thus horizontal movement of the plate 11 into and out of its locking position causes the link 60 to move vertically down and up in a slot 61 formed in the lock housing 10. This motion of the link 60 may be used to operate auxiliary bolts placed anywhere around the door edge.

In an alternative arrangement also illustrated in Figure 6, a system of levers 62 is used to operate the remote bolts. In this case the bell crank 55 and link 60 are omitted and the uppermost lever 62 is pivoted directly on the bolt plate 11. Each lever rocks about an intermediate pivot 63 so that movement of the bolt plate in the housing 10 causes these levers to rock about their pivots and operate auxiliary bolts 64 connected to them. A similar arrangement can of course, be provided at the top of the lock.

What I claim is:—

1. A door lock for cooperating with a strike box, comprising a housing, a bolt plate slidable in the housing, a bolt mounted on the bolt plate for movement between a projected and retracted position, a spring for urging the bolt plate into the projected position, handles

pivotaly mounted on the housing, independently operable coupling members between each handle and the bolt plate for the retraction of the bolt plate, a catch for retaining the bolt plate in the retracted position, and two key operated latch plates one associated with each coupling member, each latch plate blocking the movement of its associated coupling member until released by a key, the latch plate returning to its blocking position as soon as the key is withdrawn from the lock, an actuator bolt which on striking the strike box is movable into the housing to release the catch holding the bolt plate so that the bolt may be shot into the strike box, and a spring actuated blocking pawl which prevents retraction of the bolt plate and can only be moved from its blocking position by operation of one of the handles which in turn can only retract the bolt plate and bolt when the latch plate associated therewith is released by the key.

2. A door lock as claimed in claim 1 and comprising a manually controllable member which can be moved into engagement with one of the latch plates so as to hold that latch plate out of operation.

3. A door lock as claimed in claims 1 or 2, comprising link members which are connected to the bolt plate, which are movable with respect to the housing in accordance with movement of the bolt plate and are adapted to be connected with a system of levers for operating ancillary locking bolts disposed around the edges of the door.

4. A door lock substantially as herein described with reference to the accompanying drawings.

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FIG 1

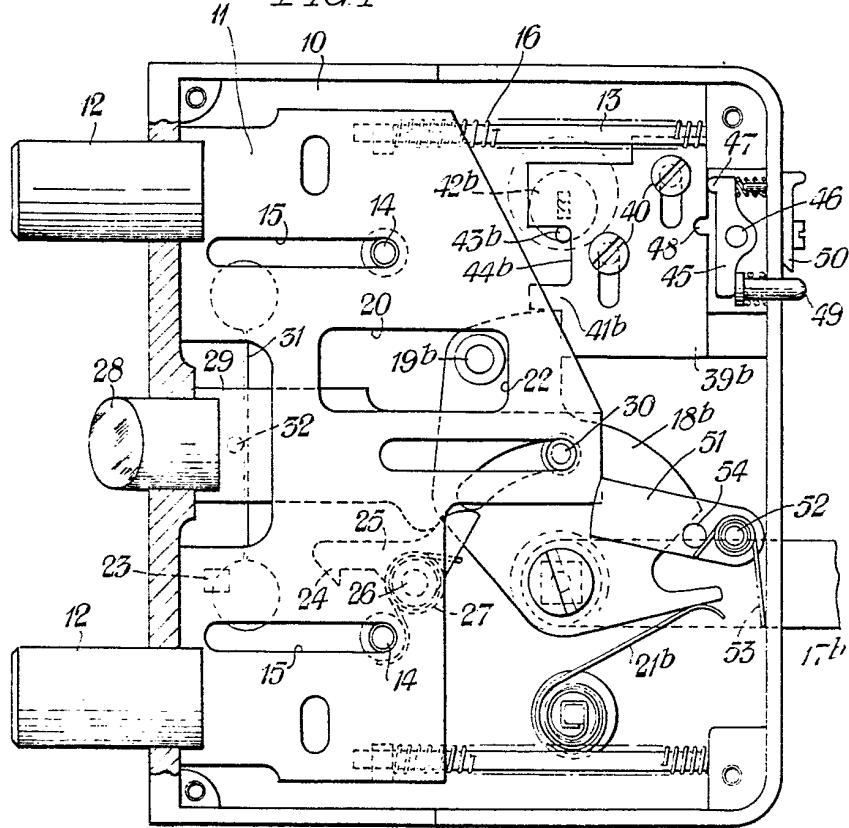
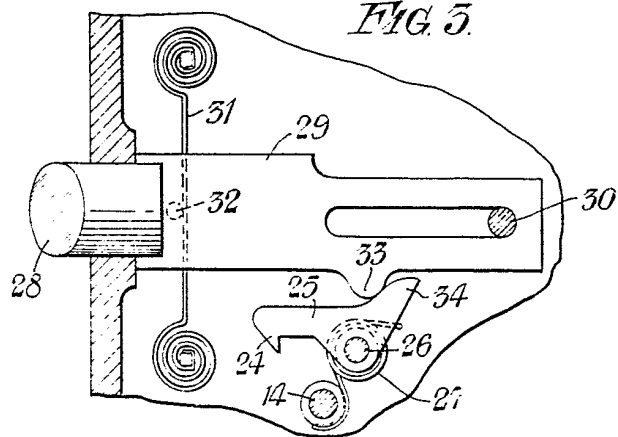


FIG 5

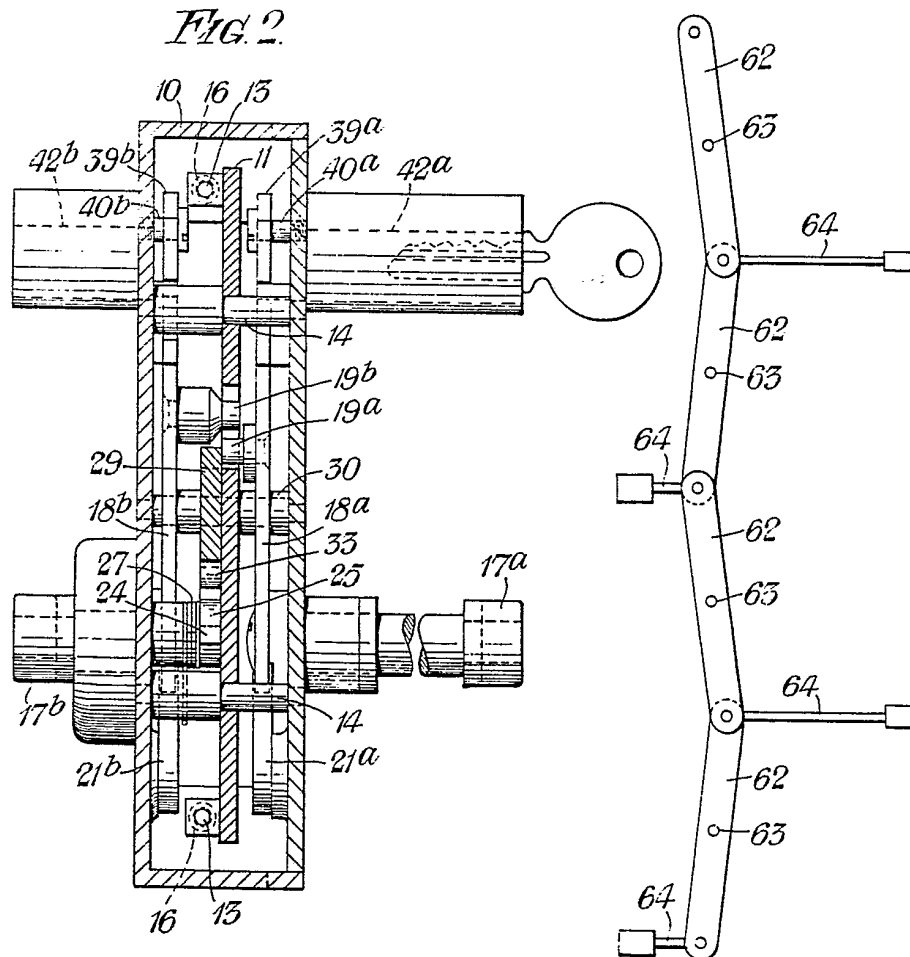
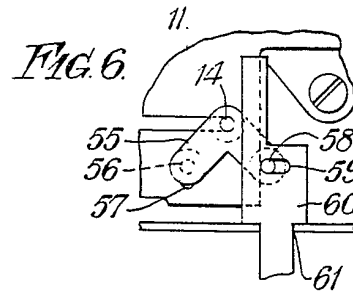


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3 SHEETS This drawing is a reproduction of the Original on a reduced scale.

This drawing is a reproduction of the Original on a reduced scale.

SHEETS 1 & 2



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3 SHEETS

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SHEETS 1 & 2

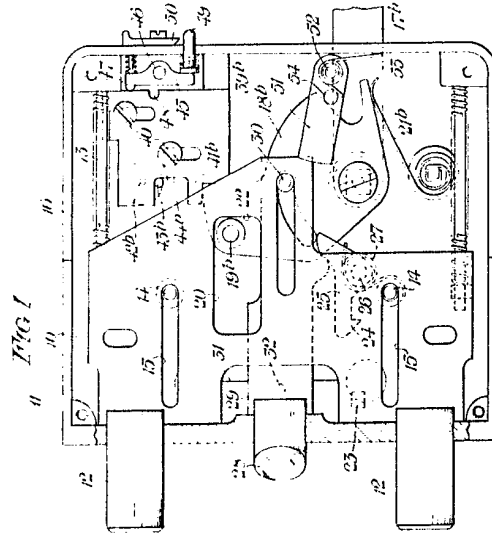


Fig. 1

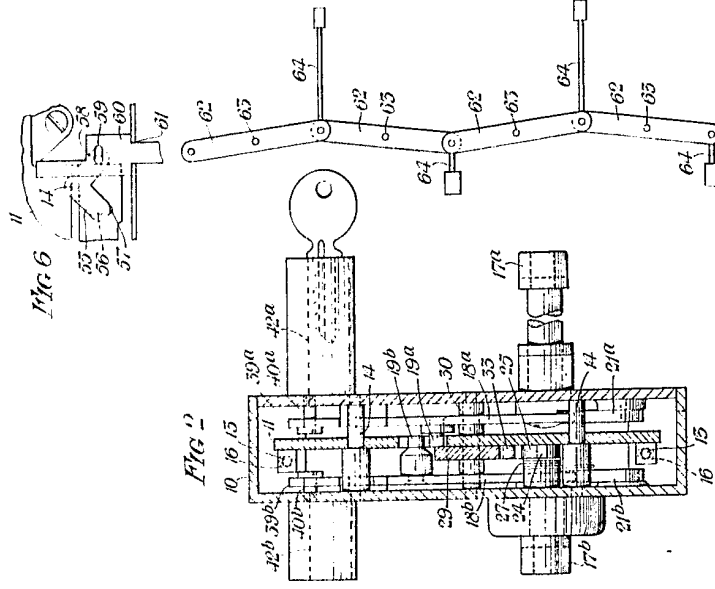


Fig. 2

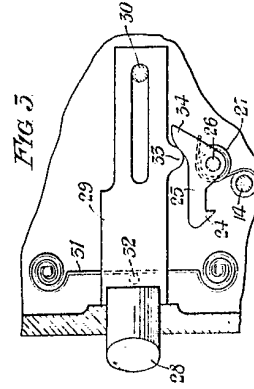


Fig. 3

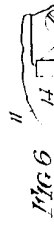
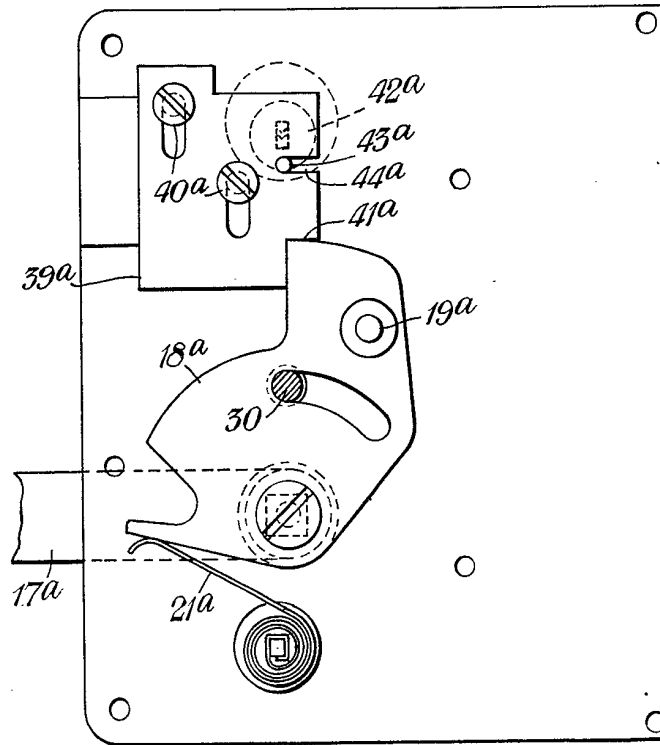


Fig. 4

Fig. 5.*Fig. 4.*