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ANTIMANIPULATIVE COMBINATION LOCK

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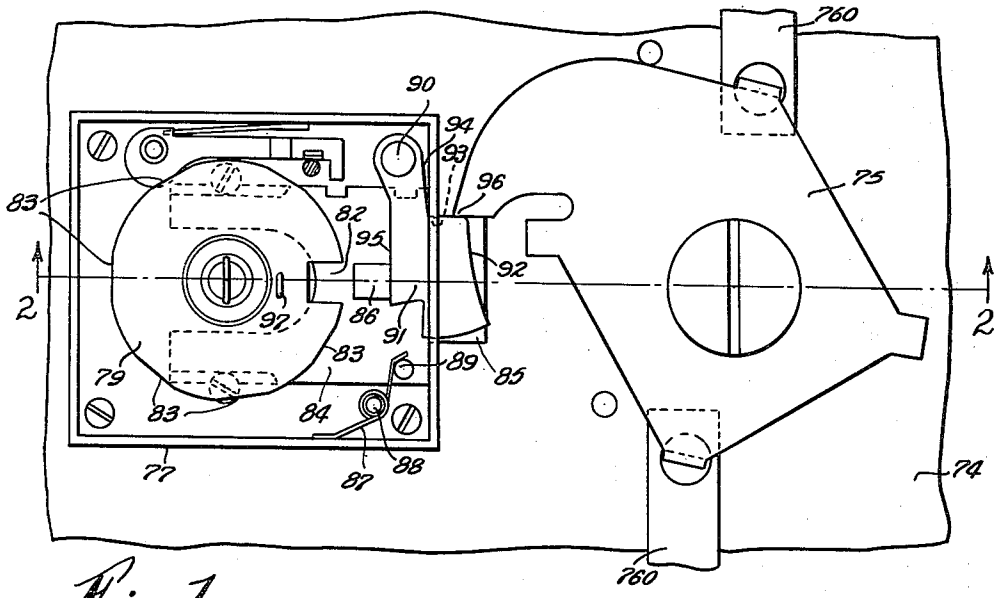


Fig. 1

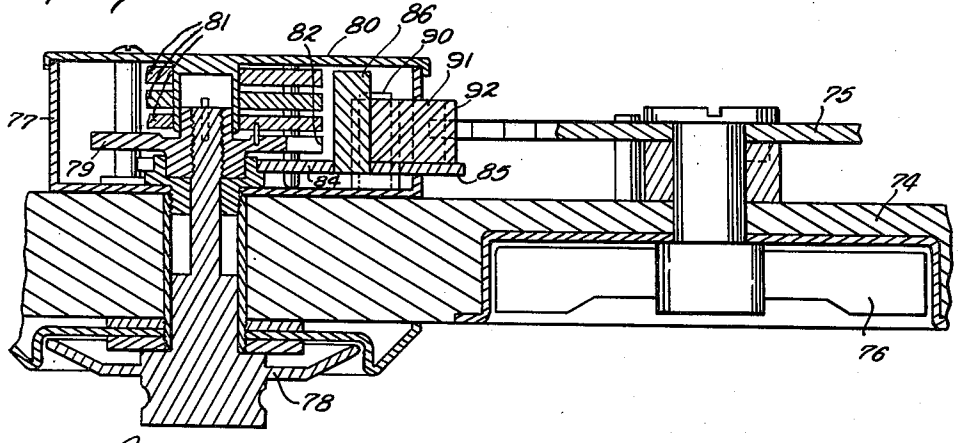


Fig. 2

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ANTIMANIPULATIVE COMBINATION LOCK

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3 Claims. (Cl. 70—333)

The familiar known and used combination locks of several types and numerous makes are allegedly insecure against surreptitious opening by certain skilled persons who, in the absence of a knowledge of the combination by means of which the lock is to be opened, reputedly from the combination in a given lock with only the aid of the sound and "feel" of the mechanism while operating the usual dial knob of the lock.

It is the major object of the present invention to render the aforesaid lock structures anti-manipulative by such alleged persons and practices without expensive or elaborate redesigning of the existing lock structures.

A further object of the invention is to accomplish the aforesaid purpose essentially by a mere reversal of the spring member of the lock which operates on the fence so that the latter is constantly urged away from the notched tumbler series of the lock and to provide simple and inexpensive arrangement of the lock parts which make it impossible to maintain a manual control of the tumblers and the lock operating cam in such a simultaneous manner as would afford an intelligible external sound or "feel" that could indicate the position of the tumbler notches interiorly of the lock.

Another object of the invention is to provide in the various types of combination locks a simple arrangement of the existing parts wherein the bolt or slide is constantly biased to locking position and the fence means is constantly urged out of contact with the tumblers.

These and other important objects are attained by the means described herein and exemplified in the accompanying drawings in which:

Fig. 1 is a fragmental elevational view of a door carrying a combination lock embodying the invention, the casing cover and its associated tumbler series being removed and disclosing the interior of the casing with the contained parts in locked position.

Fig. 2 is a cross sectional view through the door and the completely assembled lock, looking in the direction of the arrows 2—2 in Fig. 1.

It has been proposed to remedy the alleged insecurity of conventional combination locks by the use of attachments that extend through the lock casing to the exterior thereof but such arrangements leave much to be desired because locks so constructed may be required to be mounted on structures where space is too limited or where the attachment may be subject to surreptitious tampering while the structure is unlocked and open.

By the means of the present invention these and other objections are avoided, and compact and efficient antimanipulative locks are provided.

In order that the simplicity and low cost of producing the improved antimanipulative locks of the present invention may be more readily understood, it should be observed that most of the parts of the corresponding type of prior known familiar lock may be adapted and utilized unchanged in the improved lock while simple and inexpensive changes are made in the remaining few parts. It is thus possible to convert existing old locks in stock or

in use in a minimum of time and with a minimum of modified parts if desired.

With reference to the drawing depicting the invention incorporated in a familiar type of lock there is shown a cabinet door 74 or the like that has a cam plate 75 and operating handle 76 mounted thereon for actuating the door bolt operating bars 760. The lock casing 77 dial, know and its dial 78 for turning a driver disc 79, and the casing cover 80 with the tumbler discs 81 are also conventional and are adapted to control rotary movement of the cam 75. The driver disc has a notch 82 therein and is also provided with a succession of peripheral flats 83. The tumbler discs are set up so that the notches of the tumblers are in registry and alignment with the driver notch 82 when the combination has been formed in proper manner. The slide plate 84 has a part 85 of uniform thickness projecting outside the casing 77. Fixed on plate 84 is a perpendicular fence member 86 which is adapted to enter the aligned notches of the driver and the tumbler discs when the combination has been properly set up and said fence member is of course excluded from such entry when any of the notches are out of proper alignment.

The spring 87 for retaining the slide plate 84 and fence 86 in yieldably spaced relation to the peripheries of the driver and tumbler discs is supported on a pin 88 in the casing and exerts its spring pressure against a stud pin 89 in the slide plate. Pendant for free swinging movement on a fixed stud 90 in the casing is a cam block 91 which has an outwardly and downwardly extended cam surfaced part 92 that swings through an aperture 93 in the casing side wall alongside the part 85 of the slide plate. A shoulder forming part 94 abuts the inside face of the casing wall as a stop to limit the outward movement of member 91 while the fence member 86 is yieldably urged by the slide plate under the pressure of spring 87 to constantly push against the face 95 of member 91 and to urge the latter to the outwardly projected position illustrated in the drawing. The nose 96 of the manually turned cam plate 75, when in locking position as shown in Fig. 1 is in position to engage the upper end of the cam surface 92 on member 91 when the handle 75 is turned in a direction for retracting the door bolt bars 760. Such a movement cams member 91 into the casing and causes it to exert an initially stiff but straight line thrust on the fence causing limited shifting of the slide plate against the resistance of spring 87. If the driven notch 82 is not positioned as illustrated, that portion of the fence 86 closely adjacent the slide plate will engage the periphery of the driver and the peripheral flats 83 on the latter will prevent proper rotary adjustment of the driver by the "hearing or feel" of the dial knob if an attempt is made by an unauthorized person to set up the driver or the tumbler discs 81 which are rotatable by means of the driver lug 97. If the driver notch 82 is properly located and one or more of the tumbler notches be out of alignment therewith further movement is again blocked by the tumbler disc or discs. By keeping the adjustment of the operating handle 76 somewhat tight and stiff in operation the chances of "hearing or feeling" the condition of the tumblers within the casing are further reduced over and above the fact that it is always inherently impossible to simultaneously urge fence toward the tumblers and rotate the driver for adjusting the tumblers due to the reversal of the spring which constantly urges the slide plate and fence away from the axis of the tumblers.

It will be understood that the invention is not to be considered as limited to embodiment in the specific types of conventional locks indicated herein in order to render them antimanipulative. The disclosure is sufficiently representative of the simple and inexpensive adaptation thereof to other specific locks of these and other types to enable the application of the invention to the latter by those

skilled in the art within the spirit of the invention and the scope of the appended claims.

It is to be noted special completely new designs of lock of antimanipulative nature are not necessary, but are not to be excluded from the practice of the present invention.

What is claimed is:

1. In an antimanipulative combination lock, the combination with a door having a manually rotatable bolt operator with a cam thereon, and a lock casing mounted on the door and having an opening in the wall thereof which is adjacent the path of movement of said cam, of a gated rotary driver and coaxially arranged gated rotary tumblers mounted within the casing, exteriorly operable means fixedly connected with said driver for rotating the latter to adjust the tumblers according to predetermined combination with the gates thereof in alignment with the gate in the driver, a slide plate reciprocable in the casing through said opening therein and alongside the path of movement of the bolt operator cam, a cam block pivotally supported in the casing and depending alongside and across the face of the slide plate and having a laterally outward and downward extension movable through the opening in the casing into and out of the path of movement of said operator cam, a fence member fixed on the slide plate in position to enter the aligned driver and tumbler gates and to abut an adjacent edge of the depending cam block, and a spring yieldably urging the slide plate outwardly through the opening in the casing and causing the extended portion of the cam block to project through said opening into the path of movement of said bolt operator cam.

2. The combination as set forth in claim 1 characterized by the fact that the periphery of said driver is provided with irregularities for binding engagement with the fence member when the driver gate is out of alignment with the fence and the slide plate and its fence are under the influence of manual pressure exerted on the bolt operator and its cam.

3. In an antimanipulative combination lock, the combination with a door having a shallow lock casing mounted thereon and a manual bolt operator mounted on the door and having a cam movable in a path adjacent an end of said casing, the casing having an opening in said end, of a relatively thin slide plate mounted in the casing and movable through said opening, a pivot pin fixed in the casing above said slide plate, a relatively thick cam block pivoted on said pin and depending alongside said slide plate, said cam block having an outward and downward extension movable outwardly through the opening in the casing into the path of movement of the bolt operator cam and movable inwardly into the casing by said cam, a projection on the slide plate abutting the edge of the cam block, and a spring yieldably urging the slide plate outwardly through the opening in the casing and simultaneously causing the projection on said plate to swing the cam block on its pivot and into the path of movement of the bolt operator cam.

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