A guard system for door locks mainly used in metal doors. The guard system comprises two elongated registering plates applied on both sides of the door around the door lock and secured together by means of through bolts. At least one of the plates has a key hole registering with the key hole of the lock barrel and an elongated slot at the inside face of the plate receiving an elongated protruding portion of the lock barrel to positively prevent rotation and unscrewing of the lock barrel. The plate on the door opening side has a tongue overlapping the joint between the door frame and the door itself to prevent access to the lock bolt. The plate on the opposite side of the door has a tongue inserted between the door and the door stopper, in the closed position of the door, to prevent removal of said plate by an unauthorized person locked inside the premises. Preferably, one or the other, or both of the plates, form a handle to open the door. The system considerably diminishes the possibilities of tampering with the door lock mechanism.

11 Claims, 4 Drawing Figures
The present invention relates to door locks and, more particularly, to a system for preventing tampering with door locks especially those mounted in metal doors, such as aluminum doors, having a glass panel surrounded by and supported by a tubular metal frame. Such doors are extensively used as the entrance door of public places, such as stores, banks and the like.

One way for an unauthorized person to enter premises after business hours is to unscrew the cylindrical lock barrel during business hours when the door is unlocked but leave the barrel in place so that the tampering is not noticeable and then come back when the premises are empty. It is then easy to retract the bolt and open the door.

It is also found that the door frame is weakened by the holes and perforations made therein for the installation of the lock mechanism, and is easily deformed or bent by unauthorized persons to gain access to the premises.

It is therefore the general object of the present invention to obviate the above-noted disadvantages in a simple and relatively inexpensive way.

A more specific object of the present invention is to provide plates in the area of the door lock which have the multiple functions of reinforcing the door in the zone of the door lock; of preventing access to the lock bolt; of positively preventing unscrewing of the lock barrel even when the door is unlocked.

The foregoing and other objects of the invention will become more apparent during the following disclosure and by referring to the drawings, in which:

FIG. 1 is a partial plan section of a door jamb and door, the door provided with the lock guard system in accordance with the invention;
FIG. 2 is an elevation of the parts shown in FIG. 1;
FIG. 3 is a partial longitudinal section along line 3—3 of FIG. 2; and
FIG. 4 is a partial plan section of a double door in the zone of the lock mechanism and provided with the system of the invention.

In the drawings, like reference characters indicate like elements throughout.

Reference numeral 1 indicates a door jamb, which is part of a stationary door opening frame and is provided with a flange 2 acting as a door stopper and an opening 3 for receiving the usual lock bolt 4. The door jamb 1 is preferably of tubular construction and is normally made of metal, such as aluminum.

A door, generally indicated at 5, is composed of the usual glass pan 6 supported by molding 7 with the inter-position of glazing strip 8 in a rectangular door frame structure including an upright tubular member 9 opposed to the door hinges, which is adapted to come to rest against the door stopper 2 in the closed position of the door. The door frame may be made of extruded aluminum sections.

The lock bolt 4 is movably mounted within tubular member 9 and is actuated between retracted and advanced position for unlocking and locking the door respectively by a conventional mechanism, generally shown at 10, operated by a lock mechanism including the usual lock barrel 11 having a key hole 12 for the insertion of a rotatable key 13. In the example shown, as seen in FIG. 3, there are two lock barrels 11 axially aligned so that the door may be locked and unlocked from the outside and the inside of the door.

The lock barrels 11 have external threads 13 and are screwed in and supported by conventional mounting means, including a plate 18 located inside the tubular member 9 and extend through circular holes 14 made in the outside wall 15 and inside wall 16 of the upright door member 9.

The edge wall 17, that is the wall of the door member 9 facing door jamb 1 in the closed position of the door, is normally provided with an elongated opening closed by a cover plate 18 held by screws 19, which also secure plate 18. Cover plate 18 has an elongated opening for the passage of the bolt 4.

It is relatively easy for unauthorized persons to unscrew the lock barrels 11 when the door is unlocked, for instance during business hours, without said tampering being noticeable, making it easy to come back to the premises after business hours and retract the lock bolt 4 to open the door and gain entrance to the premises.

In accordance with the invention, means are provided for positively preventing unscrewing of the lock barrels without having to dismantle large size easily noticeable parts. In accordance with the invention, relatively thick elongated solid metal plates 20 and 21 are applied against the outside wall 15 and inside wall 16 respectively of the door member 9 in the zone of the locking mechanism.

Plates 20 and 21 are interconnected by through bolts 22 and nuts 23. Bolts 22 extend across door member 9 with one end of the through bolt screwed in a blind threaded bore of the outside plate 20, the nut 23 is screwed on the other end of bolt 22 and is disposed on the inside of the door. Preferably, the nuts 23 are recessed within inside plate 21 and covered by a metal disc or plug, although the head of the nut 23 is shown to be apparent in the drawings.

Each plate 20, 21 has a non-circular preferably elongated cavity 25 at its inside face disposed opposite barrel 11 and receiving a non-circular protuberance 26 of the barrel. The protuberance 26 is preferably of elongated shape and fits the cavity 25, whereby rotation of the barrel is positively prevented.

The key receiving slot 12 of barrel 11 is formed in protuberance 26 and is in register with a hole 28 made in plates 20 and 21, said holes opening within the cavity 25.

The key 13 is inserted through hole 28 in key slot 12. Thus, the plates 20, 21 overlap the protuberances 26 of barrels 11 and only the key receiving slot 12 is visible and accessible. The two plates 20, 21 which extend from a point above the barrels 11 to a point well below the bolt 4 and actuating mechanism 10 therefor, serve also to reinforce the door member 9. Outside plate 20 has a lip 29 extending along its outer longitudinal edge and coextensive therewith and protruding from the edge wall 17 of the door member 9 to overlap door jamb 1 in the closed position of the door, to thereby prevent access to the bolt 4. Lip 29 is preferably of smaller thickness than the remainder of plate 20. Inside plate 21 is also provided with a lip 30, of reduced thickness, disposed along its outer longitudinal edge and coextensive therewith and underlying door stopper 2 in the closed position of the door.
3,698,217

The lip 30 prevents an unauthorized person inside the premises, with the door being locked, from removing inside plate 21 by inserting a hook-shaped member between the door stopper 2 and the inside plate 21 and between said inside plate and the door member 9 and trying to pry the inside plate away from the door member 9, using door jamb 1 as a fulcrum. The unauthorized person will also have great difficulty in prying inside plate 21 away from door member 9 along the inside edge 31 of said plate 21, because protuberance 26 interferes with the walls of cavity 25 when plate 21 is forced to take an inclined position with respect to door member 9.

Preferably, the outside plate 20 has an angular extension 32 forming a door handle. Such a door handle 32 could be provided on inside plate 21 or on outside plate 20, or on both plates 20, 21, so as to have a door handle on the inside or on the outside, or on both sides of the door.

It will be noted that, even if edge plate 18 is removed, it is impossible to unscrew the barrels 11, because of non-rotatable engagement of the barrels with the plates 20 and 21. These plates are reinforcement for the upright member 9 in the zone of the locking mechanism where the member 9 is weakened by the holes necessary for the passage of the locking mechanism and the passage of the lock barrels 9. Finally, the lips 29 and 30 prevent access to lock bolt 4 and prevent prying off plate 21 respectively, when the heads 23 are made non-accessible by a plug or the like.

As shown in FIG. 4, the same system can be applied to a double door; the door 5' which carries the door lock being fitted with plates 20, 21, while the other door 5'' is adapted to be releasably secured in closed position and its upright member 1' has a door stopper 2' and receives the door bolt 4.

What I claim is:
1. A door lock guard system comprising, in combination, with a door having outside and inside faces, an externally threaded lock barrel rotatably mounted in said door and protruding said outside face, the protruding portion of said barrel having a non-circular cross-sectional shape, said protruding barrel portion having a key receiving slot, an outside plate applied to said door, covering said outside face in the zone of said lock barrel in direct contact with said outside face having a cavity complementary with the protruding portion of said barrel to non-rotatably receive the same, and having a hole in register with said cavity opening at the outside face of said plate and in alignment with said key receiving slot, said hole being of smaller size than said cavity, whereby said plate overlaps said barrel protruding portion, and means to rigidly secure said outside plate to said door.
2. A door lock guard system as claimed in claim 1, further including an inside plate directly applied against the inside face of said door opposite said outside plate, both plates being of elongated shape, said securing means including through bolt means extending through said door and directly interconnecting said two plates.
3. A door lock guard system as claimed in claim 2, wherein an externally threaded second lock barrel is rotatably in said door and has a portion protruding from the inside face of said door and provided with a second key receiving slot, said last-named portion having a non-circular cross-sectional shape, said inside plate having a second cavity complementary with said last-named barrel protruding portion and non-rotatably receiving the same, said inside plate having a hole making communication between said second cavity and the outside of said inside plate and in alignment with said second key receiving slot.
4. A door lock guard system as claimed in claim 1, wherein said outside plate has a lip protruding outwardly from the edge of said door and adapted to overlap an adjacent upright member in the closed position of said door.
5. A door lock guard system as claimed in claim 2, wherein said inside plate has a lip portion of reduced thickness along its edge coincident with the outer edge of said door, said lip portion being applied against the door inside face and adapted to abut and underlie a door stopper of an upright member in the closed position of said door.
6. A door lock guard system as claimed in claim 5, wherein said outside plate has a lip extending along the outer edge thereof protruding from the edge of said door and adapted to abut and overlap a stationary upright member in the closed position of said door.
7. A door lock guard system as claimed in claim 1, wherein said outside plate has an integral extension forming a door handle.
8. A door lock guard system as claimed in claim 2, wherein said inside plate has an integral extension forming a door handle.
9. A door lock and guard system as claimed in claim 2, wherein said plate has an integral extension forming a door handle.
10. A door lock guard system as claimed in claim 4, wherein said upright member is a portion of a second removably secureable door in a common door opening.
11. A door lock guard system as claimed in claim 2, wherein said door comprises a glass pane supported and surrounded by a rectangular frame of tubular cross-section, said lock barrel and lock bolt being arranged in one side of said frame, said plates having a width substantially equal to the width of said frame side, applied longitudinally thereof and extending to a point above the lock barrel and below the lock bolt.

* * * *