April 25, 1939. P. W. OLSON 2,155,440

LOCK

Filed March 25, 1937

FIG. 1.

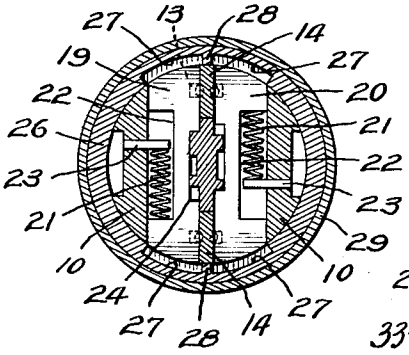


FIG. 5.

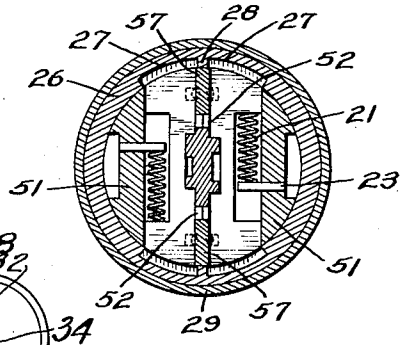


FIG. 8.

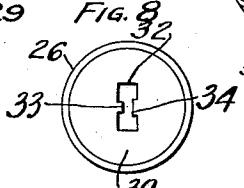


FIG. 2.

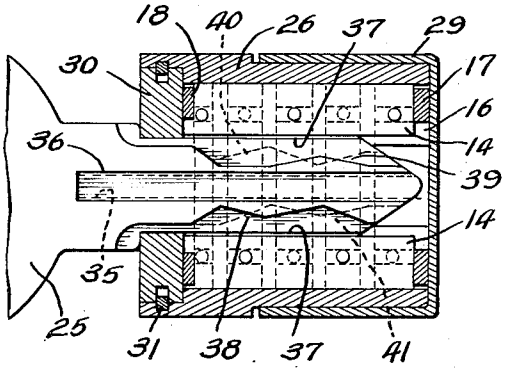


FIG. 6.

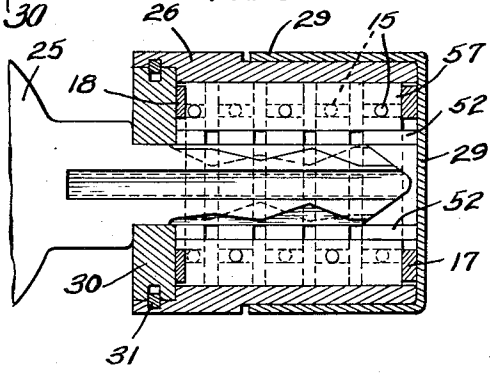


FIG. 3.

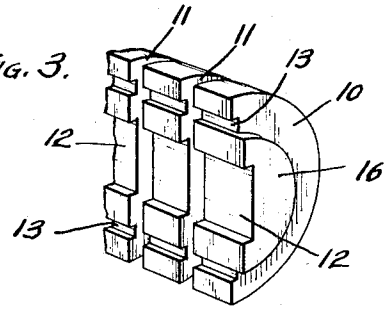
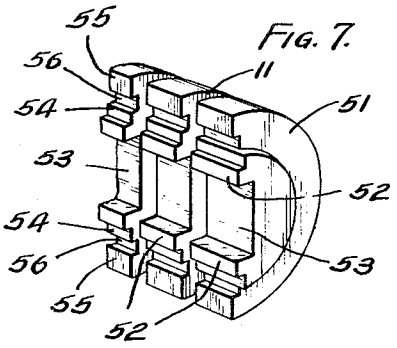


FIG. 7.



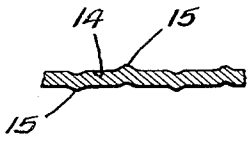


FIG. 4.

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2,155,440

LOCK

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Application March 25, 1937, Serial No. 132,937

12 Claims. (Cl. 70—358)

This invention relates in general to a multiple tumbler type of lock in which tumblers are mounted in slots at opposite sides of a keyway, and have a key with dissimilar cam surfaces on both sides at the sides thereof near the edges thereof to operate the tumblers in opposite directions for moving the tumblers out of engagement with the lock cylinder against the pressure of tumbler projecting springs.

An important object of the invention is in the provision of a lock having a straight key engaging surface either formed by the key plug or by a contact plate inserted between adjacent segments of a plug.

A further object of the invention is to provide a strong abutment for the key engaging surface either by backing up the plug sections with an abutment plate or inserting such an abutment plate between the segments themselves.

A still further object of the invention is in the provision of a key plug formed of segments held in proper and accurate alignment by milled cuts in the segments and by opposite projections on an abutment plate inserted between them.

A further object of the invention is in the provision of a key hole plate which has opposite wards for engaging similar or different straight grooves in a key for limiting the entry of other instruments than the key and thereby preventing injury to the interior of the lock.

Other and further objects of the invention will appear hereinafter, the accompanying drawing illustrating preferred embodiments of the invention, in which

Fig. 1 is a cross section and Fig. 2 is a longitudinal section showing a key in place, of a lock embodying the invention;

Fig. 3 is a perspective of a portion of one of the two identical lock plug segments.

Fig. 4 is a cross section of one of the abutment plates showing the opposite extrusions;

Fig. 5 is a cross section and Fig. 6 is a longitudinal section with a key in place, of a modified form of lock;

Fig. 7 is a perspective of a portion of one of the two identical lock plug segments as shown in the modification in Figs. 5 and 6; and

Fig. 8 is a front view of a lock showing the keyhole plate.

In the type of lock to which this invention relates the key is formed with parallel and straight edge riding surfaces and the sides of the key near the edges or corners are formed with deviating shoulders which engage the tumblers at opposite sides of the keyway. The lock plug has corresponding surfaces to engage the edges of a key or an abutment plate is inserted between the segments which make up a key plug so that the key will be inserted straight and smoothly within a lock, there is no tendency to move the key up and down, and no tendency to jamb or injure any of the lock parts by the insertion of a key.

Furthermore there is less possibility of inserting another instrument such as the end of a screw driver or any other flat instrument for the express purpose of wrecking a lock of this kind. As an added precaution the keyhole plate may also be provided with projections either similar or dissimilar for entering straight grooves at the sides of a key, for guiding the insertion of a key and insuring that it be inserted in the proper direction, and at the same time for limiting the size of the keyhole opening so that it is much more difficult to insert an instrument for the purpose of damaging the lock and preventing or interfering with its operation.

Referring now more particularly to the drawing, a lock of this kind comprises opposite lock segments 10, in this case similar in form and substantially semi-circular in shape, having spaced tumbler grooves 11, a central key slot 12, and milled cuts 13 at the ends of the key slot.

Two of these segments 10 are placed together with a connector plate 14 abutting the surfaces at each end of the key slot and at the opposite side of each plate 14 are projections or extrusions 15 at opposite sides of the plate adapted to enter the milled slots 13 of the opposite segments and to maintain them accurately in alignment together. The ends of the segments have central semi-circular projections 16 which are engaged by end rings 17 and 18 for holding together the key plug segments thus assembled.

In each segment and at each side of the key slot are tumblers 19 and 20 each mounted in a tumbler slot 11 and pressed in one direction or the other as by a spring 21 seated in a recess 22 opposite the key contact edge of the tumbler, one end of the spring engaging the end of the recess and the other end engaging a pin 23 inserted in the plug segment and projecting into the recess 22. The other edge of each tumbler has a key engaging recess 24 which is moved by one of the engaging surfaces of a proper key 25.

A complete lock plug thus assembled is inserted in a lock cylinder 26 having longitudinally milled grooves 27 for engaging the projected outer ends of the lock tumblers and with a rib 28 between adjacent grooves normally in alignment with the

outer edge of the abutment and sliding plates 14 as shown more clearly in Fig. 1. The inner end of the lock cylinder is shown encased in a shell 29 and the outer end has a keyhole plate 30 secured thereto by a peripheral lock spring 31 and in opposite sides of a keyhole opening 32 of the plate are projecting wards 33 and 34 which correspond to grooves 35 and 36 in the sides of a key for assisting in positioning it and for materially closing the keyhole opening against the admission of unauthorized keys or other pointed implements.

A key for this lock has straight parallel edges 37 which fit closely against the inner surfaces of the abutment plates 14 so that it will ride smoothly thereon when the key is inserted. At the opposite sides adjacent the corners of the key are unrelated tumbler operating surfaces 38, 39, 40 and 41 for operating the different sets of tumblers at opposite sides of the keyway and those at the same side of the keyway which move in opposite directions. The lock and key shown by Figs. 5, 6 and 7 is similar to the other with the exception that the lock plug segments 51 have projections 52 at the end of a key slot 53 which directly abut with each other, leaving surfaces 54 and 55 beyond it which are separated by a milled slot 56 so that a connecting and abutment plate 57 rests on the surfaces 54 and 55 of opposite segments and backs up the projections 52 at the edges of the key slot. This plate 57 is also normally in alignment with a separating rib 28 between the grooves 27 of a key cylinder 26 and an inserted key directly engages the projections 52 of the key plugs rather than the inner surfaces of the plates 14 as shown in Figs. 1 and 2.

In both forms the plug segments are kept accurately together and in proper alignment by the projections or extrusions of the abutment plates and the lock is protected against injury or defacement by the aligning and abutment plate and the keyhole plate limits the entry of any unauthorized key or implement by which the lock would be damaged.

I claim:

1. A lock having segments together forming a keyway with tumbler slots at the sides, and a plate extending longitudinally between the segments having means to engage the segments to hold them in alignment.

2. A lock having segments together forming a keyway and tumbler slots communicating therewith, a plate between the segments having oppositely extending projections and the segments having recesses to engage the projections for aligning the segments.

3. In a lock having segments to form a lock plug with a keyway and tumbler slots at the sides thereof, a guide plate at the opposite meeting edges of the segments, means on the guide plate to engage and align the segments and means for binding the segments and plates together.

4. In a lock having plug segments with slots to form a keyway and central projections at the ends, plates having oppositely extending projections, the segments having recesses to engage the plate projections for holding the segments in alignment, and rings for engaging the segment projections for holding the segments together with the plates therebetween.

5. In a lock, plug segments with longitudinal slots at the center and near the edges, abutment plates with oppositely extending projections disposed between the segments at their edges, the projections engaging the slots near the edges for accurately aligning the segments when placed together.

6. In a lock, identical plug segments each having a central slot, together forming a keyway, abutment plates extending longitudinally between the segments, the plates having projections and the segments having recesses for engaging the projections and aligning the segments, and the plates forming abutments parallel with and reinforcing the edges of the keyway.

7. In a lock, a key plug comprising identical segments placed together to form a key slot, abutment plates between the segments at their edges having means to engage and align both segments, binding rings engaging the ends of the segments and holding them together with the plates abutting the rings at their ends.

8. In a lock, a tumbler plug comprising segments together forming a keyway and tumbler slots, abutment plates between the segments at their edges having oppositely extending projections to engage and align both segments, a lock shell having tumbler recesses and an intermediate ridge between the recesses and in line with the plates in the locked position.

9. In a lock, a lock shell, a tumbler plug rotatable therein comprising segments to form a keyway, abutment plates at the edges between the segments having means to engage and align both segments, and a face plate at the front of the shell having wards to limit the key space to prevent insertion of a damaging instrument.

10. In a lock, a plug comprising segments together forming a keyway with tumbler slots at the sides thereof, and abutment and slide plates positioned between the segments at the edges of the keyway having means for aligning the segments and forming contact surfaces for engaging the parallel edges of a key which has tumbler contact shoulders at the sides thereof.

11. In a lock having a key with parallel edges and side tumbler engaging shoulders and straight side grooves, a pair of plug segments together providing a keyway with straight edges and tumbler slots at the sides thereof, plates with oppositely extending projections at the edges between the segments to align them, tumblers projecting into the sides of the keyway, and a lock shell having inside recesses to engage the outer ends of the tumblers when they are extended from the tumbler slots.

12. In a lock, a plug comprising segments having portions which abut to form a keyway, the edges of the segments being recessed beyond said portions which form the edges of the keyway to provide longitudinal spaces, and plates disposed in said spaces and against said portions to form abutments, the plates having oppositely extending projections to engage the edges of the segments for aligning them and to complete the plug.

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