July 27, 1943. L. E. DEUTSCH 2,325,310

LOCK

Filed March 2, 1939

Fig. 1.

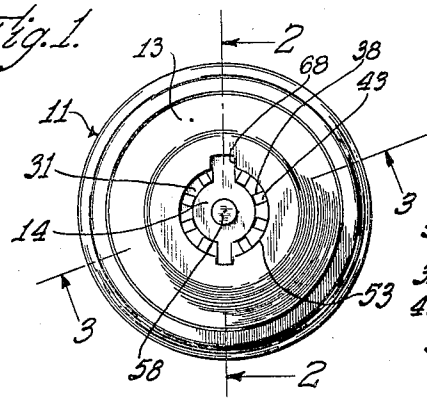


Fig. 4.

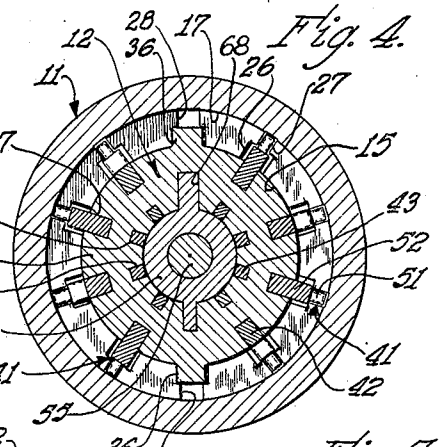


Fig. 2.

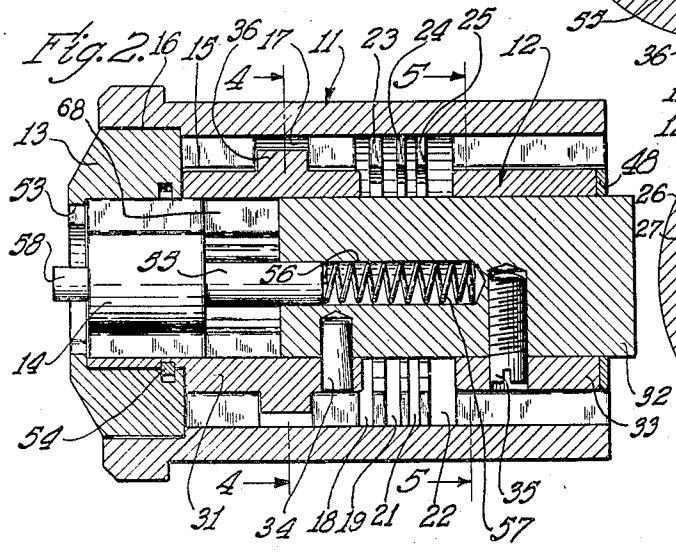


Fig. 5.

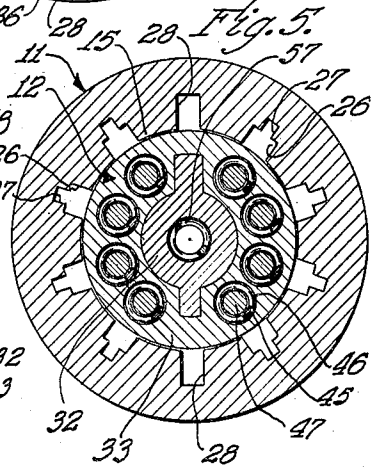


Fig. 6.

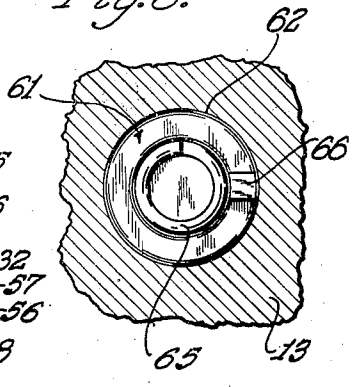
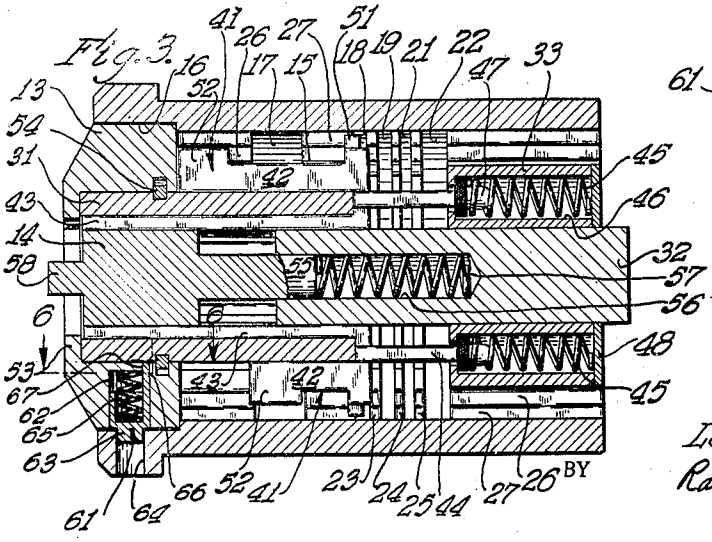


Fig. 3.



INVENTOR.
Leo E. Deutsch
BY
Rasmussen and Brugman
ATTORNEYS.

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2,325,310

LOCK

Leo E. Deutsch, Hammond, Ind.

Application March 2, 1939, Serial No. 259,336

4 Claims. (Cl. 70—382)

This invention relates in general to locks, and more particularly to adjustable, key operated tumbler locks; and constitutes an improvement in the type of lock disclosed in my prior United States Letters Patent No. 2,019,399, October 29, 1935; No. 2,021,433, November 19, 1935; No. 2,024,030, December 10, 1935; and No. 2,060,978, November 17, 1936.

A principal object of the invention is the provision of an adjustable, key operated lock having unitary locking actuators, instead of the two-part, relatively adjustable tumblers and actuators of the locks of my prior patents above enumerated.

Another important object of the invention is the provision of such a lock in which the combination set therein may be readily changed by merely repositioning some or all of the several locking actuators employed, or by replacing the same with similar locking actuators having different characteristics.

A further important object of the invention is the provision of such a key operated lock having a carrier for the locking actuators which may be removed from its supporting casing by operation of a key having the proper combination set therein to facilitate the setting of a different combination in the lock by removal and subsequent repositioning or replacement of the locking actuators in the carrier.

Another important object of the invention is the provision in such a lock of an auxiliary locking means to prevent unauthorized removal of the carrier from the casing, which is rendered operable to permit removal of the carrier from the casing only when a particular key is used in the lock, said auxiliary locking means remaining inoperable when any other key is inserted into the lock, even though the combination of the latter key is correctly set to enable it to operate the lock.

A further and very important object of the invention is the provision of a substantially pick-proof lock, i. e. a lock which it is substantially impossible to open except by a key having the actuators therein set to the same combination as that to which the locking actuators of the lock are set.

Another object of the invention is the provision of such a lock which is extremely simple in construction, efficient in operation, and cheap to manufacture.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

In the drawing,

Figure 1 is a front elevational view of a lock embodying the features of my invention;

Fig. 2 is a longitudinal, vertical section taken substantially on the line 2—2 of Fig. 1, with the locking actuators removed from the lock;

Fig. 3 is a longitudinal sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a transverse, vertical section taken substantially on the line 4—4 of Fig. 2, with the locking actuators in place;

Fig. 5 is a transverse sectional view taken substantially on the line 5—5 of Fig. 2; and

Fig. 6 is a detail, longitudinal section taken substantially on the line 6—6 of Fig. 3.

Referring more particularly to the drawing, the lock embodying the features of my invention which is illustrated therein comprises an outer casing member indicated generally by reference numeral 11, a carrier indicated generally by reference numeral 12, which is adapted to be rotatably mounted within the casing 11, a front plate 13 and a guard plug or plate member 14 slidably mounted for longitudinal movement relative to the carrier 12 and the front plate 13.

The casing 11 is cylindrical in shape and is dimensioned exteriorly similarly to the usual cylinder lock to facilitate insertion thereof into a suitable aperture in a door or the like (not shown) to which it is adapted to be permanently secured in any desired manner. The casing 11 is provided interiorly with a longitudinally bore 15 (Figs. 2, 3 and 5) for the accommodation of the carrier 12. The bore 15 is enlarged or counterbored for a relatively short distance at its forward end at 16 to accommodate the front plate 13. The bore 15 is also enlarged for a short distance intermediate its ends to provide a circumferential channel 17 (Figs. 2, 3 and 4) for a purpose to be later described. Similarly, the bore 15 is enlarged at spaced intervals to the rear of the channel 17 to provide narrow channels 18, 19, 21 and 22 (Figs. 2 and 3) which define circumferential ribs 23, 24, and 25. A plurality of longitudinal grooves (shown herein as eight in number) are broached or otherwise cut through the inner portion of the casing 11, each of which comprises an inner portion 26 and a narrower outer portion 27 diametrically alined therewith (Figs. 4 and 5). In addition to these grooves 26, 27, the casing 11 is also provided with a pair of diametrically opposed grooves 28 (Figs. 4 and 5) which are nar-

rower than the grooves 26 and slightly wider than the grooves 27, and together with the grooves 26, 27, are evenly spaced about the inner periphery of the casing 11. The several grooves 26, 27 and 28 extend longitudinally through the casing 11 from the inner end of the enlarged portion 16 of the bore (Fig. 3).

The carrier 12 is made up of three separate parts, comprising a main part 31 which is in the form of a hollow cylinder, a centrally disposed plug 32, and a rear part 33 which is also in the form of a hollow cylinder. The outer diameter of the two parts 31 and 33 is very slightly less than the inner diameter of the bore 15 in the casing 11. The inner diameters of the two members 31 and 33 are substantially the same as the outer diameter of the member 32. As is shown best in Figs. 4 and 5, the center member or plug 32 is provided with a pair of diametrically opposed, longitudinally extending flanges of different width which are adapted to engage suitable longitudinally extending grooves provided in each of the end members 31 and 33. The central member 32 extends less than half the way into the rear end of the main member 31 and completely through the rear member 33. It is secured to the main member 31 in any suitable manner, such as by a driven pin 34 (Fig. 2) extending through suitable cooperating apertures in the members 31 and 32. The rear member 33 is removably secured to the plug 32 by means of a screw 35 (Fig. 2) for a purpose to be later more fully explained.

The outer periphery of the main member 31 of the carrier 12 is provided with a pair of diametrically opposed lugs 36 which are of slightly shorter length than the width of the channel 17 provided in the casing 11 (Fig. 2), and are adapted to be positioned in alinement with this channel when the carrier 12 is properly positioned within the casing 11 as shown in the drawing. The lugs 36 are wider than the grooves 28 in the casing 11 (Fig. 4), but are sufficiently narrow to permit sliding thereof longitudinally of the casing through any of the grooves 26. These lugs 36 function to prevent longitudinal movement of the carrier 12 relative to the casing 11 when the lug is in its locked position, as shown in the drawing, for a purpose to be later more fully described.

The main member 31 of the carrier 12 is provided in spaced relationship around its outer periphery with a plurality of radially disposed grooves 37 (Fig. 4) which are spaced to coincide with the grooves 26, 27 in the casing 11 when the carrier is disposed therein in its locked position of the drawing. The inner portion of the member 31 is provided with a plurality of circumferentially spaced grooves 38 which are smaller than the grooves 37 and are radially alined therewith. The grooves 38 are preferably broached in the member 31, while the outer configuration of the member 31, including the grooves 37 and the lugs 36, may be obtained by using stock which is extruded to such shape.

The grooves 37 and 38 in the main member 31 of the carrier 12 are provided for the purpose of slidably accommodating longitudinally disposed locking actuators 41 (Figs. 3 and 4). Each of the locking actuators 41 comprises a unitary member having three parts, a main or tumbler part 42, a forwardly extending leg or actuating part 43, and a rearwardly extending leg 44. The actuator legs 43 of the members 41 are slidably disposed within the several grooves 38 in the main member 31 of the carrier 12. The tumbler part 42 of each of the members 41 is slidably disposed in the associated groove 37 in the member 31. In their normal position, as shown in Fig. 3, that portion of each of the members 41 joining its tumbler part 42 and actuator leg 43 abuts against the inner end of the member 31. The locking actuators 41 are resiliently retained or held in this position by means of springs 45 (Figs. 3 and 5).

A spring 45 is positioned in each one of a plurality of longitudinally disposed recesses 46 which are provided in the rear member 33 of the carrier 12 in radial alinement with the grooves 37 and 38 in the member 31. The forward end of each of the recesses 46 is reduced in diameter to provide a suitable shoulder against which the head portion of a plug 47 is adapted to engage. One of these plugs 47 is disposed in each of the recesses 46 and is provided with a reduced rear end portion which slidably engages the interior of the associated spring 45. After the several springs 45 and plugs 47 have been assembled in the rear member 33, the rear ends of the apertures 46 are closed by rigidly securing a plate 48 (Fig. 3) to the rear end of the member 33 in any suitable manner. The rear legs 44 of the several locking actuators 41 engage the forward surfaces of the heads of the several plugs 47.

It will be noted in passing, that the central member 32 of the carrier 12 extends rearwardly beyond the plate 48, and it is to this portion of the member 32 that the usual throwbar may be secured in any desired manner.

The main or tumbler portion 42 of each of the locking actuators 41 is provided adjacent its junction with the legs 43 and 44 with an outwardly extending protuberance 51 (Fig. 3) which is narrower than the remaining part of the tumbler member 42 (Fig. 4). The width of this protuberance 51 is very slightly less than the width of the associated grooves 27 in the casing 11, and it functions as an auxiliary locking lug in a manner to be more fully described hereinafter.

Each of the locking actuators 41 is provided at the forward end of its tumbler portion 42 with an upwardly extending main locking lug 52. The lugs 52 are of the same width or thickness as the main portion of the tumbler part 42 (Fig. 4), and are of slightly less length than the width of the channel 17 in the casing 11 (Fig. 3). As will be noted in Fig. 3, the different locking actuators 41 have their tumbler portions 42 of different lengths. For example, the upper member 41 in Fig. 3 is shown as being of maximum length, while the lower member 41 is of minimum length. Others of the members 41 may have their tumbler portions 42 of any selected different lengths between these two limits. The purpose of employing locking actuators having tumbler portions of different lengths will be more fully described hereinafter.

As has been described above, the front plate 13 is rotatably mounted upon the carrier 12. This is accomplished by providing an enlarged bore or recess in the front plate 13 which extends forwardly therethrough to within a short distance of the front end thereof and is so shaped as to slidably and rotatably engage the forward end of the main member 31 of the carrier 12. The forward end of this bore in the front plate 13 is reduced to provide a limited shoulder or stop portion 53 (Figs. 2 and 3). The outer periphery of the main part 31 of the carrier 12 and the inner periphery of the front plate 13 are

provided with annular recesses which coincide with each other when the two members are in their assembled position of Figs. 2 and 3. A split ring or spring washer 54 is disposed within these two recesses for the purpose of securing the members 13 and 31 together to permit relative rotation thereof, while preventing relative longitudinal movement therebetween. It will be appreciated that the circumferential recess provided for this purpose in the front plate 13 is of sufficient depth to accommodate the ring 54 when the latter is expanded, in order to facilitate assembly of these parts.

With the above construction, the inner surfaces of the actuator lugs 43 of the locking actuators 41 would be exposed within the bore of the main part 31 of the carrier 12. In order to protect these actuator lugs 43 and to prevent the accumulation of dirt and other foreign matter in the bore of the member 31, the guard plug 14 is slidably mounted therein. The plug 14 has substantially the same cross sectional shape as has the center member 32 of the carrier 12 (Figs. 1 to 3). Outward movement of the guard plug 14 is limited by the shoulder 53 of the front plate 13. The rear portion of the guard plug 14 is cut away or reduced to provide a cylindrical stop or post 55, the rear end of which is shaped to slidably engage within a suitable axial bore or recess 56 provided within the front end of the center member 32 of the carrier 12. A coil spring 57 is mounted within this recess 56 in the center member 32 for the purpose of engaging the rear end of the post 55 to resiliently maintain the guard plug 14 in its forward position, as shown in the drawing. The front end of the guard plug 14 may also be provided with a forwardly extending, axially disposed stud 58 for the purpose of engaging within a suitable recess in the forward end of a key to guide the movements of the latter into the lock.

With the mechanism as above described, it will be readily apparent that the carrier 12, together with the front plate 13 and guard plug 14, may be moved longitudinally into and out of the casing 11, as a unit, if the parts are properly positioned circumferentially, in a manner to be later more fully described. Means are provided for locking the front plate 13 in its assembled position in the casing 11, as shown in the drawing, to prevent any movement thereof relative to the casing. Such means, of course, will not prevent rotation of the carrier 12 relative to the front plate 13 and the casing 11.

This auxiliary locking means is provided for the purpose of preventing unauthorized removal of the carrier 12 from the casing 11, and comprises a hollow pin 61 (Figs. 3 and 6) which is slidably mounted within an axially disposed recess 62 in the front plate 13. The recess 62 extends inwardly from the outer periphery of the plate 13 to within a short distance of the bore provided in said plate. The pin 61 is provided at its outer end with a reduced portion 63 which is adapted to engage within a suitable axially disposed recess 64 in the outer flange of the casing 11. A coil spring 65 is mounted within the hollow portion of the pin 61, and engages the bottom portion of the recess 62 in the plate 13 to resiliently urge the pin 61 outwardly relative to the plate 13 to maintain the reduced portion 63 of the pin in the recess 64. After the pin 61 and spring 65 have been assembled in the recess 62, the marginal portion of the plate 13 surrounding the outer end of the recess 62 may be slightly upset to prevent outward movement of the pin 61 relative to the plate, beyond its position of Fig. 3.

The inner end of the hollow pin 61 is cut away in any suitable manner to provide an inwardly extending leg or protuberance 66 which is adapted to slidably engage within a small companion recess 67 (Fig. 3) extending through the front plate 13 from the inner end of the recess 62 to the bore of the plate. The circumferential position of this protuberance 66 on the hollow pin 61 may be varied as desired, providing that the recess 67 be disposed in radial alinement therewith. The purpose and function of this auxiliary locking mechanism will be further described hereinafter.

The above described lock is intended to be operated by a suitably formed key, somewhat similar to that disclosed in my prior U. S. Letters Patent No. 2,090,114 of August 17, 1937. The key will be provided with bits or actuating members arranged to longitudinally coincide with the actuator lugs 43 of the locking actuators 41. The outer dimensions of the key will be such as to permit its insertion through the bore of the front plate 13 and into the bore of the main member 31 of the carrier 12, and a suitable aperture may be provided in the front end of the key for engaging the pin 58 to guide the movement of the key into the lock.

In such longitudinal movement of the key into the lock, the guard plug 14 will be moved rearwardly of the lock against the action of the spring 57. If the key actuators are set to the proper combination, i. e., to that combination to which the locking actuators 41 of the lock are set, complete insertion of the key into the lock will move the actuator lugs 43 of the locking actuators 41 rearwardly to position the locking lugs 52 of the tumbler portions 42 of the locking actuators in coincidence with the channel 17 in the casing 11. If all of the locking actuators are thus properly moved to this passive or released position, the key may then be rotated to rotate the carrier 12 relative to the casing 11 and the front plate 13. It will be noted that such proper rearward movement of the locking actuators 41 will result in the lugs 51 provided thereon being positioned in coincidence with one of the several channels or recesses 18, 19, 21 or 22 provided in the casing 11.

If any one of the locking actuators 41 is not properly moved to such passive or inactive position, the locking lug 52 on the tumbler portion 42 thereof will be in engagement with some portion of its associated groove 26 in the casing 11 to prevent rotation of the carrier 12 relative to the casing. By employing locking actuators having tumbler portions 42 of different lengths, it will be seen that a very large number of possible combinations results. It will also be apparent that the key actuators must necessarily be set to the same combination to which the locking actuators 41 of the lock are set, in order that the carrier 12 may be rotated relative to the casing 11. Upon removal of the key from the lock, the springs 45 will return the locking actuators 41 to their locking positions, as shown in the drawing, and the spring 51 will return the guard plug 14 to its normal position.

In order to change the combination in the lock, it is necessary to remove the carrier 12 from the casing 11. After this has been accomplished, the screw 35, or whatever other retaining means is employed, may be removed or released to permit

withdrawal of the rear member 33 of the carrier, including the springs 45 which are housed therein, from the center member 32. All of the locking actuators 41 are then free to be removed in a rearward direction from the carrier. Consequently, these locking actuators 41 may then be replaced in different positions from their original positions in the carrier, or different locking actuators may be inserted therein. The actuators provided in the key for operating the lock may then be reset to the new combination in the lock. In the above-described removal of the rear member 33 from the center member 32 of the carrier 12 to enable repositioning of the locking actuators 41 to set a new combination in the lock, it will be appreciated that the fact that the springs 45 cannot fall out or become displaced is of material importance.

In order to permit the removal of the carrier 12 from the casing 11, the carrier must be rotated relative to the casing by a key having the proper combination set therein. Such rotation must be sufficient to position the lugs 36 on the main part 31 of the carrier in longitudinal coincidence with a selected pair of diametrically opposed grooves 26 in the casing. This is due to the fact that the grooves 28 in the casing 11 are too narrow to permit sliding of the lugs 36 therethrough, while the grooves 26 are sufficiently wide to accommodate the lugs 36. In other words, the lugs 36 function to normally prevent withdrawal of the carrier 12 from the casing 11. The grooves 28 must be provided, however, to permit withdrawal of the particular locking actuators 41 that are moved to coincidence therewith upon the proper rotation of the carrier to effect withdrawal thereof from the casing. If the grooves 28 were not provided, one pair of the diametrically opposed locking actuators 41 would have no exit channel from the casing, and these particular actuators 41 would be disposed with their locking lugs 52 in a closed portion of the channel 17. Since the rear end of the main portion of the locking actuators 41 would then be disposed in engagement with the front surface of the rear member 33 of the carrier, it would be impossible to move the carrier longitudinally relative to the casing. It will be understood that the lugs 36 may be differently positioned than herein illustrated, and that the grooves 28 may be dimensioned differently to accommodate both the lugs 36 and the locking actuators 41 when the lugs are so positioned, if desired.

In order to complete the removal of the carrier from the casing, however, it is necessary that the key which is being employed and which has the proper combination set therein be provided with a recess which will radially coincide with the recess 67 in the front plate 13 when the key has been rotated the proper distance relative to the casing and the front plate to otherwise permit withdrawal of the carrier from the casing. With such a key, and having it properly positioned with the above described recess in radial alinement with the recess 67, the hollow pin 61 may be moved inwardly relative to the front plate 13 to remove the reduced portion 63 thereof from the recess 64 in the casing 11. Such inward movement of the hollow pin 61 will only be permitted when a key having the necessary recess is positioned in the lock with such recess in alinement with the inner end 66 of the pin. As is shown in Fig. 3, the inner end of the pin 66 normally abuts against the outer periphery of the main member 31 of the carrier 12. Rotation of the carrier by the key to the proper position to permit withdrawal thereof from the casing, however, will bring a longitudinal groove or recess 68 provided in the member 31 at the top thereof, as shown in Fig. 2, into alinement with the protuberance 66. If the key does not have the necessary recess therein for accommodation of this protuberance 66, even though it have the proper combination set therein, it will be impossible to move the pin 61 inwardly out of its normal locking position shown in Fig. 3, since the protuberance 66 will then abut against the key.

It will thus be seen that the carrier 12 can be removed from the lock only by a key having not only the proper combination set therein, but also having a recess which is properly positioned so as to be alined with the protuberance 66 when the key is rotated in the lock to carrier removable position. Consequently, it is possible to provide any number of keys with the proper combination to permit unlocking of the lock therewith, while preventing removal of the carrier from the casing by the use of such keys. It will also be apparent that the protuberance 66 and the aperture 67 may be disposed in any of a plurality of positions about the circumference of the hollow pin 61, so that similar auxiliary locking mechanism may be employed in different series of locks. As shown in the drawing, it is necessary to rotate the instant carrier through 72° in a clockwise direction, viewing Figs. 1, 4 and 5, to bring it into position to be removed from the casing. However, any other desired degree of rotation may be employed to accomplish this function. It will be understood, of course, that the pin 61 may be of solid construction, with the spring 65 surrounding it, rather than being hollow as illustrated herein.

The instant lock has the extremely novel advantage of being substantially pick-proof. In order to prevent any unauthorized operation of this lock, the grooves 27, channels 18, 19, 21 and 22, circumferential ribs 23, 24 and 25, and the auxiliary locking lugs 51 on the locking actuators 41 have been provided. When it is attempted to pick a lock, that is to operate the same without using the proper key therefor, it is customary to selectively contact the tumblers, or in the instant case the locking actuators, with a suitable instrument and, by maintaining a substantial rotational pressure against the tumblers, to move them individually and longitudinally until such pressure is perceptibly released therefrom. In this manner, it is possible to determine the exact setting of each individual tumbler in practically any lock. In the instant lock, however, it is substantially impossible to so operate it.

In order to obtain the necessary pressure above referred to, the carrier must be moved as far as possible in a clockwise direction, for example, to hold the locking actuators 41 against the sides of their associated grooves in the casing 11. If only the main locking lugs 52 of the locking actuators 41 were employed, such pressure would be between this portion of the tumbler parts 42 and the side surfaces of the recesses 26. In such case, it would be possible for an expert to pick the lock.

However, it will be noted that the auxiliary protuberances 51 on the locking actuators 41 are narrower than the main portion of the locking actuators, and fit their associated grooves 27 much more closely than the main part of the locking actuators fit the grooves 26. Consequently, in attempting to obtain the necessary

pressure against the locking actuators, only the auxiliary lugs 51 will be in contact with the casing 11. While to an exceptional expert such pressure might be sufficient for the desired purpose, it will be noted from Fig. 3 that any subsequent rearward movement of any of the locking actuators 41, in an effort to determine its setting, will result in an almost immediate relieving of such pressure, due to the auxiliary lug 51 being thus moved into coincidence with the channel 18. This is due to the fact that the channel 18, as well as the channels 19, 21 and 22, is of sufficient width to accommodate the auxiliary lug 51.

In this way, it will be substantially impossible for anyone to unauthorizedly ascertain the setting of the locking actuators 41. If the person attempting to unauthorizedly open the lock decides that this first position to which he has moved the particular locking actuator 41 is its passive position, and if it happens that the particular actuator is one similar to the upper one in Fig. 3, such will obviously be an erroneous decision. Without going into further detail, it is thought that the operation of these several parts in preventing the picking of the instant lock will be fully understood by one skilled in the art. It should be pointed out, however, that if the person attempting to unauthorizedly open the lock does subsequently discover his error and continues to move the locking actuator 41 rearwardly, the same result will obtain each time that the auxiliary lug 51 is positioned in coincidence with any one of the grooves 18, 19, 21 or 22.

When it is attempted to unauthorizedly operate the lock in the manner above described, the circumferential flanges 23, 24, and 25, together with the auxiliary lugs 51 on the locking actuators 41, function to block the longitudinal movement of the locking actuators which is necessary in order to ascertain the passive position thereof. An auxiliary lug 51 is released from its lateral pressure, in any attempt to unauthorizedly operate the lock, only when it moves into one of the channels 18, 19, 21 or 22. The lateral pressure will then be had on the main lug 52 of the locking actuator 41, but sufficient information cannot thus be gained, because the auxiliary lug 51 will then be disposed within one of the channels to block any further rearward longitudinal movement of the locking actuator 41. As a result, the pressure which is obtained cannot be accompanied by the necessary longitudinal movement to impart the "feel" to the person attempting to unauthorizedly operate the lock.

It will be noted from Fig. 3 that even in their normally passive position, as illustrated by the lower locking actuator 41, the locking actuators must be moved a short distance rearwardly in order to bring them into their true passive position. Consequently, whenever it is attempted to unauthorizedly rotate the carrier relative to the casing, the auxiliary locking lug 51 of each of the locking actuators will be the only portion thereof initially providing the necessary lateral pressure, and when such pressure is obtained against the main lug 52, the auxiliary lug 51 will block longitudinal movement of the locking actuator.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A lock of the class described, comprising a casing, a carrier rotatably and removably positioned within said casing, and a plurality of locking actuators supported by said carrier for longitudinal movement relative thereto and adapted to be removed from said carrier and repositioned relative to each other only upon removal of said carrier from said casing, said locking actuators comprising integral members having separate actuating and tumbler portions, and different ones of said tumbler portions being of different lengths to facilitate the setting of different combinations in said lock.

2. A lock of the class described, comprising a casing, a carrier rotatably and removably positioned within said casing, and a plurality of locking actuators supported by said carrier for longitudinal movement relative thereto and adapted to be removed from said carrier and repositioned relative to each other only upon removal of said carrier from said casing, said locking actuators comprising integral members having separate actuating and tumbler portions, said tumbler portions having locking lugs cooperating with grooves in said casing, and different ones of said locking actuators having said lugs disposed at different points longitudinally thereof.

3. In a lock of the class described, a casing, a carrier mounted for rotation within said casing, tumblers mounted on said carrier for movement longitudinally thereof to permit rotation of said carrier relative to said casing, locking lugs on said tumblers normally disposed in longitudinal grooves in said casing for preventing rotation of said carrier relative to said casing, and auxiliary lugs on said tumblers normally disposed in narrow grooves in said casing forming radial extensions of said longitudinal grooves to alone resist initial unauthorized rotation of said carrier relative to said casing.

4. A lock of the class described, comprising a housing, a carrier rotatably and removably positioned in said housing, a plurality of locking actuators supported by said carrier for limited movement relative thereto and adapted to be removed from said carrier and repositioned relative to each other upon removal of the carrier from said housing, individual springs for said locking actuators, and means removably mounted on said carrier for maintaining said locking actuators thereon and for housing said springs and retaining the same against displacement therefrom upon removal of said means from said carrier.

LEO E. DEUTSCH.