Sept. 4, 1962 D. J. FOOTE ETAL 3,052,114

KEY CONTROLLED, COMBINATION CHANGING, PERMUTATION LOCKS

Filed June 23, 1960 2 Sheets-Sheet 1

Fig. 1.

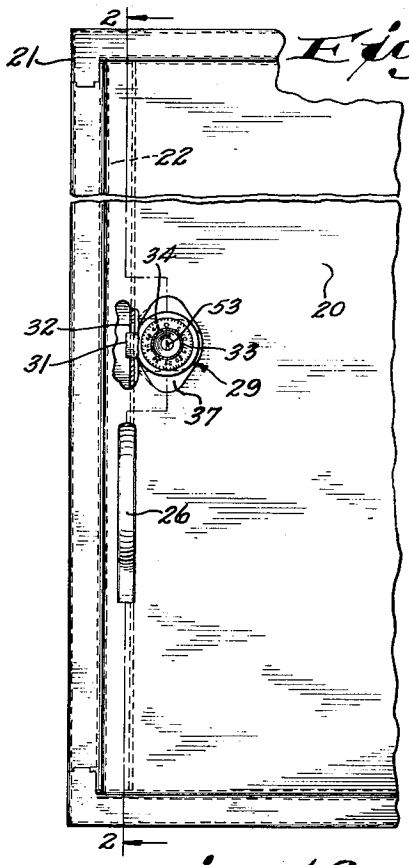


Fig. 2.

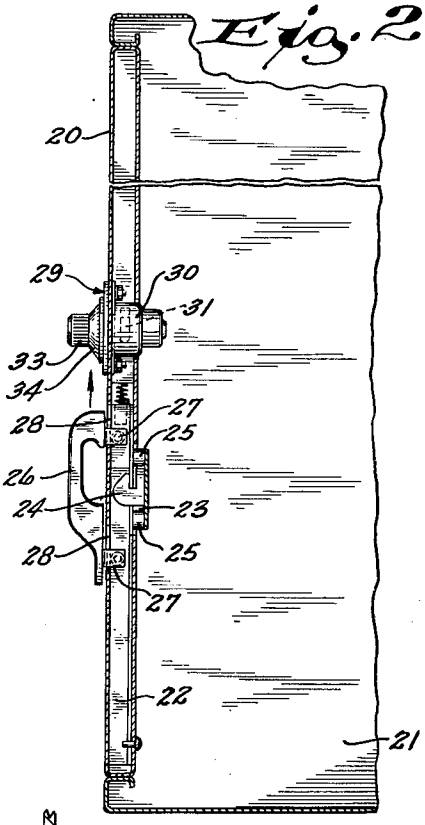


Fig. 1a.

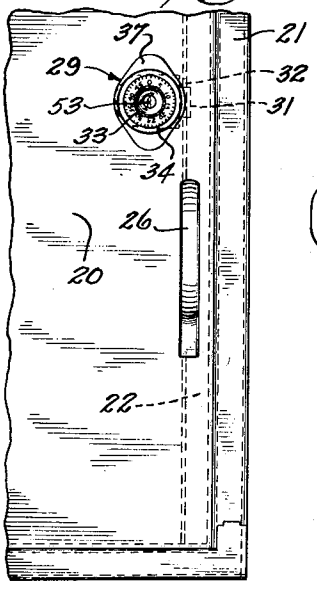
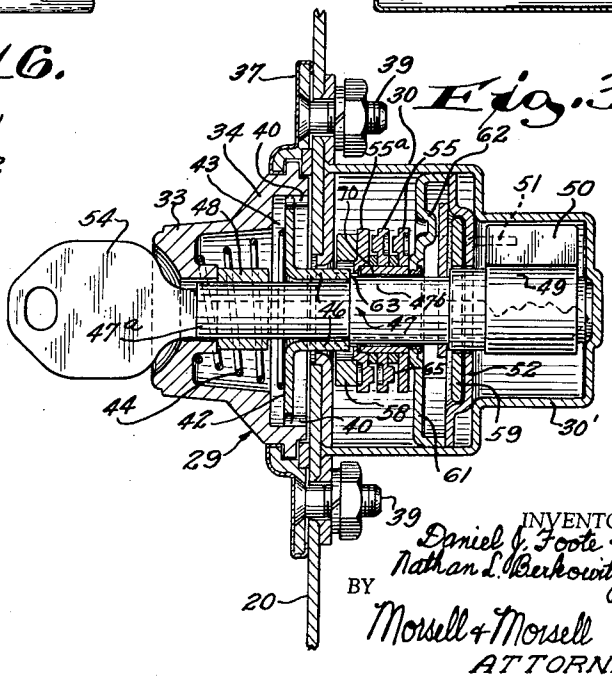


Fig. 3.



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Fig. 4.

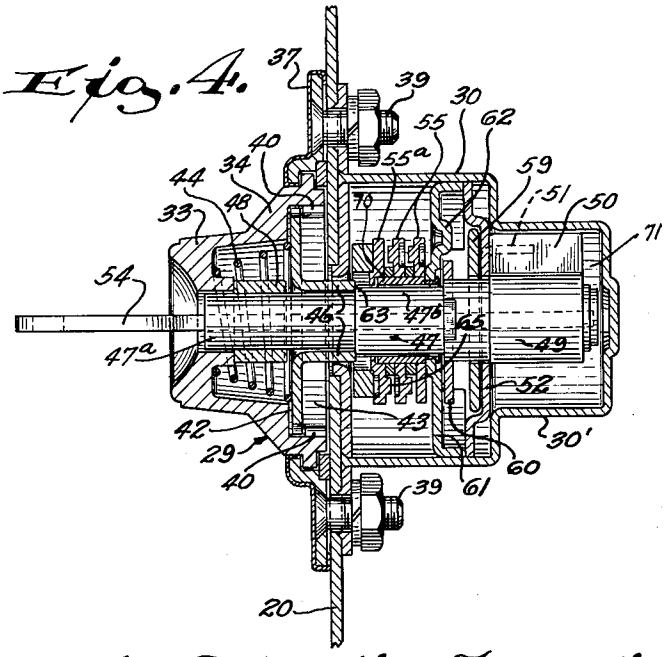


Fig. 5.

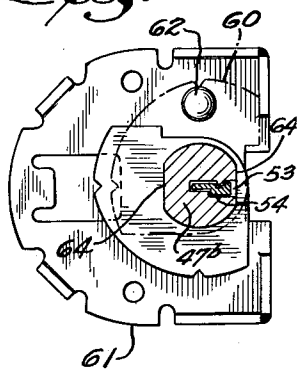


Fig. 6.

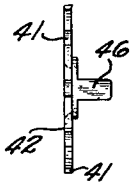


Fig. 7.

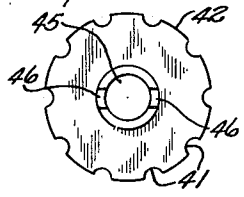


Fig. 8.

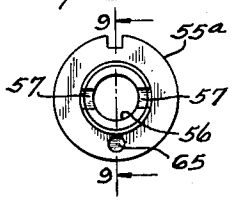


Fig. 9.

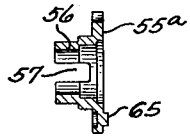


Fig. 10.

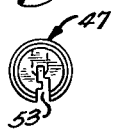


Fig. 11.

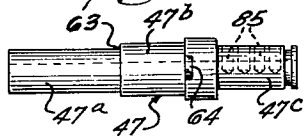


Fig. 14.

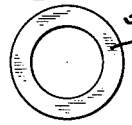


Fig. 15.



Fig. 12.

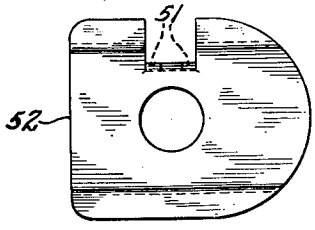


Fig. 13.



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3,052,114

KEY CONTROLLED, COMBINATION CHANGING, PERMUTATION LOCKS

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Filed June 23, 1960, Ser. No. 38,260
10 Claims. (Cl. 70—315)

This invention relates to improvements in key controlled, combination changing, permutation locks.

Wherever key controlled permutation locks are used for lockers and the like, it is possible to open one or all of the locks in a series of lockers by the user dialing the pre-assigned combination for his individual locker, or one or all of the locks may be opened by the school principal, factory foreman, or other custodian using a master or control key that will fit the particular lock, and all of the other locks in the group or installation, without the necessity of dialing each lock. However, as school terms or semesters end and students graduate, or employees leave a factory or plant, and as other users shift or change, then periodically the lockers may be re-assigned to other users. In practice, it has been found very desirable from a protection viewpoint, at the time of such new term, shift, period or semester to be able to change the combination of each locker lock whereby the prior user, no longer using the particular locker on which the lock is installed, cannot later have access thereto through knowledge of the combination formerly used on the locker lock. It has been possible, with conventional permutation locks, to change the combinations by altering the positions or relationship of the dials to the tumbler discs by either releasing the dials or by moving the same a uniform multiple of numbers away to start a new combination series. These prior arrangements, however, involved either removing the locker lock entirely, or the use of special tools, keys or instruments to disengage the dials and reset the new combinations, such procedures being very complicated and time consuming, and requiring that an experienced person follow detailed instructions in effecting the combination changes.

With the foregoing in mind it is, therefore, a general object of the invention to provide an improved key controlled permutation locker lock having a novel key controlled mechanism for changing the combination of the lock, such mechanism being of simplified and sturdy construction and susceptible of being quickly manipulated by an unskilled person.

Another object of the invention is to provide a permutation lock having a novel combination changer controlled by operation of a master key whereby the combination of the lock can be quickly and easily changed without the necessity of removing the lock and dial assembly to reset the dial and discs.

Another object of this invention is to provide a key controlled permutation locker lock with a key operated combination changer mechanism which lock can be opened by the individual user dialing the assigned combination, or by an authorized official or custodian using the proper control key without dialing, the arrangement furthermore permitting an authorized person to subsequently, through a manipulation of the control key, to thereafter easily change the combination to any of a plurality of pre-assigned different combinations, so that a prior user no longer using the particular locker on which this lock is installed, cannot thereafter have access thereto by dialing the combination formerly assigned or used on the particular locker lock.

A still further object of the invention is to provide, in a key controlled permutation lock, a control key operated

mechanism for permitting the change of the combination, which combination changing mechanism eliminates the possibility of making any errors, since the mechanism permits a return to the starting point or the original assigned combination.

Another object of the invention is to provide an improved key controlled permutation lock having a novel combination changer equipped with a key-operated cylinder in the rear of the lock case operating the lock mechanism, whereby, when the locker door is opened by use of a special control or master key, the combination can be easily changed without the necessity of removing the lock and dial assembly.

A more specific object of the invention is to provide, in a lock of the class described having a rotatable combination dial containing a recessed cylinder plug, a one piece lock casing housing in its rear portion a cylinder which is controlled by an elongated control key, permitting a school official or other locker custodian having custody of the key to easily change the combination of the lock to any of a number of other combinations, without removing or disassembling the lock or using special tools to reset the dial and tumbler discs.

Still another object of the invention is to provide an improved key controlled permutation lock having a novel key-type combination changer wherein the key-operated cylinder is in the rear of the lock case, instead of being forwardly in the dialing knob, with the result that the cylinder is hidden behind the tumbler discs of the lock rendering it tamperproof and inaccessible for picking, pounding or tampering.

Still another object of the invention is to provide in an improved key controlled permutation locker lock, a recessed and extended cylinder and plug assembly under spring tension but capable of being horizontally moved when operated by a special control key to affect a combination changing mechanism, thus allowing an authorized person to operate the proper control key to open the lock and locker door, whereupon a forward pull on the key while it remains in the plug and cylinder will cause the disengagement of a notched disc driver plate which, followed by a turning of the dial, renders it easy to change the combination numbers of the lock to other pre-assigned numbers for dialing, since the relationship between the dial and tumbler discs has been changed by such operations.

Another object of this invention is to provide a key-type movable cylinder assembly combination changer for a controlled permutation locker lock wherein the combination of the lock can be changed by use of the control key and a manual push and pull action imparted thereto while in the keyway of the lock, without disassembling the lock.

Still another object of the invention is to provide a permutation lock combination changer which will permit the change to newly assigned combinations that may be staggered, scrambled and unrelated to a uniform multiple of numbers away from the original combination of the lock.

A further object of the invention is to provide a key controlled, combination changing permutation lock especially adapted for lockers and the like, and which is of simple and rugged construction, is easy to assemble, operate and effect combination changes, is tamperproof, is neat and attractive in appearance, and is well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved key controlled, combination changing permutation lock, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawings in which the same ref-

erence characters indicate the same parts in all of the views:

FIG. 1 is a fragmentary front view of a locker door equipped with the improved key controlled, combination changing permutation lock;

FIG. 2 is a vertical sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is an enlarged vertical sectional view through a portion of a locker door and the improved lock as installed therein showing the parts in locked condition and prior to such turning movement of the key as will permit changing the combination of the lock;

FIG. 4 is a similar enlarged vertical sectional view only showing the unlocked condition of the lock so that the combination changing mechanism is in condition to be operated to effect a change of the combination;

FIG. 5 is a rear view of the internal back plate of the lock;

FIG. 6 is a side view of the disc driver plate;

FIG. 7 is a face view thereof;

FIG. 8 is a face view of a hubbed first tumbler disc;

FIG. 9 is a sectional view thereof taken on line 9—9 of FIG. 8;

FIG. 10 is an end view of the stepped cylinder plug and plug extension;

FIG. 11 is a side view thereof;

FIG. 12 is a face view of a locking slide guide and cylinder retainer plate;

FIG. 13 is an edge view thereof;

FIG. 14 is a face view of a spacer washer;

FIG. 15 is an edge view thereof; and

FIG. 16 is a fragmentary front view of a locker door equipped with the improved key controlled, combination changing permutation lock only showing the door opening in the direction opposite to that disclosed in FIG. 1.

While the improved key controlled, combination changing permutation lock is susceptible of broader application, in its preferred environment the locks may be incorporated in the hinged doors of a series of identical lockers such as are used in schools, factories and public buildings where some official or custodian may have possession of a master key which controls the opening of one or all of the locks in said group of lockers, should it be expedient or necessary for the official to open one or more of the locks without the necessity of dialing the different combinations of the individual lockers. Furthermore, at any given period, after the custodian has opened the lock of one or more of the lockers in the series he may, through a simple operation, cause the combinations of any selected locks to be changed.

By way of illustration, and with particular reference to FIGS. 1 and 2 of the drawings, it will appear that the numeral **20** indicates the hinged door of a standard locker **21** of the type mentioned. The locker **21** and the latch mechanism for the door are of standard construction so only certain features thereof will be briefly described.

Within the vertical margin of the free edge of the locker door **20** there is mounted a vertically reciprocating latching bar **22** which is adapted to be raised and lowered to bring the upper shoulder of a slot **23** into and out of latching engagement with a latch dog **24** fixedly mounted on a frame portion of the locker adjacent the vertical margin of the door opening. Said latch dog carries resilient door stop bumpers **25**. On the exterior of the locker door **20** adjacent the free vertical margin thereof is mounted an operating handle **26** having tongue portions **27** integral therewith which extend through slots **28** in the face of the door **20** and are secured to the latching bar **22**. Consequently, when the permutation lock installed in the locker door, and which will be described in detail hereinafter, is unlocked, the handle **26** may be lifted vertically to raise the latching bar **22** and disengage the top shoulder of the slot **23** from the latching dog **24**, whereby the locker door is free to be swung to open position.

The improved key controlled, combination changing permutation lock is indicated generally by the numeral **29** and it is mounted on a face of the locker door **20** adjacent the free vertical margin thereof and above the latch operating handle **26**, as shown in FIGS. 1 and 2. Portions of the lock extend through an opening therefor in the locker door **20**. The lock casing **30** is in practice secured adjacent the inner face of the door **20** and carries certain internal mechanism which controls a lock bolt **31** which projects through a vertical slot **32** in the locker door latching bar **22** and, depending upon the position of the lock bolt **31** relative to the ends of the slot **32**, said lock bolt will block or permit vertical reciprocation of the locker door latching bar **22**, the lock bolt **31** being reciprocatable vertically within said slot **32** when certain of the internal mechanism of the lock is operated. The permutation lock **29** includes a knurled knob **33** which projects outwardly from the outer face of the locker door **20** and which has formed integral therewith a larger graduated dial **34** operatively overlying an outer face portion of the door **20**. The combined knob and dial **33—34** is mounted in the manner shown and described in the Stahl et al. copending application, Serial No. 10,760, filed February 24, 1960.

The dial mounting assembly includes an escutcheon plate **37** which carries a decorative overlay and which covers and renders inaccessible the heads of certain securing bolts **39**.

The numeral **42** (see FIGS. 3, 4, 6 and 7) designates a notched disc driver and combination setting plate or connector which can be prearranged in a variety of circularly advanced positions so that a selected pair of diametrically opposed notches **41** therein will engage a pair of diametrically opposed semi-circular lugs **40** formed on a ring surrounding an opening **43** in the inner end of the knob and dial assembly, all as was described in said copending Stahl et al. application, but in the instant embodiment the knob opening **43** is of considerably greater depth than the thickness of the plate **42** whereby the plate **42**, under conditions hereinafter to be described, may move from the lug engaging position of FIG. 3 to the lug disengaging position of FIG. 4 and in so doing, a confined coiled spring **44**, within the dialing knob is compressed. Also, the notched plate **42** is formed with a central circular opening **45** therein on diametrically opposite margins of which there are a pair of inwardly directed, transversely curved fingers **46** at right angles to the plane of the plate **42**, and which engage surface portions of the reduced forward part **47*a*** of a stepped cylinder plug and plug extension **47**, shown in detail in FIGS. 10 and 11 and which is mounted axially in the casing **30** and knob and dial assembly. The compressible confined coiled spring **44** surrounds a collar **48** which is carried by a portion of the plug part **47*a*** within the hollow portion of the dialing knob **33**.

The stepped cylinder plug and plug extension **47** also includes a portion **47*b*** immediately inwardly of the outermost portion **47*a*** and of slightly larger diameter. Adjoining the portion **47*b*** to the right thereof relative to the drawings, is a pin tumbler cylinder **47*c*** surrounded by a cylinder shell **49**. The latter has an integral laterally extending flange **50** housed within the hollow rear extension portion **30'** of the lock casing and held against rotation by bifurcations **51** extending rearwardly from a lock slide guide and a cylinder retaining plate **52**.

The stepped cylinder plug and plug extension has therein a longitudinal keyway or slot **53** (see FIGS. 5 and 10) to receive a specially formed and extremely elongated master or control key **54**. The master or control key **54**, when inserted into the keyway or slot **53** in the plug member **47** can turn said plug member and its extensions and the notched portions of the key will register with the pin tumblers **85** in the cylinder extension of the member **47**, in a manner well known in the art. The intermediate por-

tion 47*b* of the plug member 47 is surrounded by a cylindrical sleeve 70 which is secured fast to a back plate 61. Said sleeve 70 rotatably carries thereon a plurality of tumbler discs 55 and 55*a* separated by washers, the disc 55*a* being shown in detail in FIGS. 8 and 9 and being the tumbler disc furthest toward the left relative to FIGS. 3 and 4. All of the tumbler discs, of course, are formed with notches or fences. The first tumbler disc 55*a* has a hub portion 56 having diametrically opposed slots 57 therein which extend within the opening in a spacer washer 58 and are engaged, when the lock is in the condition of FIG. 3, by the curved fingers 46 carried by the disc driver plate 42.

It should be understood from the description thus far given that when the lock parts are in the condition shown in FIG. 3 with the key 54 removed, the permutation mechanism, which is one means of controlling the lock bolt 31, may be operated by dialing the correct combination. This is done by turning the dialing knob 33 which, through the connection of the lugs 40 with preselected disc driver plate notches imparts rotative movement to the tumbler discs 55*a* and 55 by the engagement of the fingers 46 with the slotted hub portion 56 of the tumbler disc 55*a*. Then, through the means described in the Stahl, et al. copending application, Serial No. 10,760 filed February 24, 1960, a locking slide 59 is retracted from its holding engagement with a lever retaining bar, whereby the locker door latching bar 22 may be reciprocated upwardly through a manual operation of the handle 26, which movement also shifts the lock bolt 31 upwardly in the latching bar slot 32. The locker door may thus be opened. The locking slide guide and cylinder retaining plate 52 mounted within the rear of the main portion of the lock casing 30 is shown in detail in FIGS. 12 and 13 and is dished so as to slidably receive therewithin the locking slide 59. Forwardly of the locking slide 59 and mounted fast on the portion 47*b* of the plug 47 to turn therewith, is a cam 60 which normally occupies the position shown in FIG. 3.

It will be appreciated from the description thus far that the improved permutation lock is of the type which can be opened by a proper operation of the permutation mechanism through turning of the dialing knob 33 to the correct combination, or by insertion of the master key 54 into the cylinder plug and plug extension 47 and turning of the same to operate the lock bolt 31 in the manner described in said copending Foote et al. application, Serial No. 15,196, filed March 15, 1960. As was mentioned, the present invention is concerned primarily with the mechanism which will permit the combination of the lock to be changed through insertion in the cylinder plug of the master or control key 54. For this purpose, the key 54 is inserted in the manner shown in FIG. 3 and in this condition, the arrangement of the parts is as is illustrated in said view with the coiled spring 44 exerting an expansive force against the notched disc driver plate 42 with the fingers 46 of the latter engaging the slotted collar 56 of the first tumbler disc 55*a*. The spacer washer 58 and the washers interposed between the tumbler discs 55 and 55*a* serve to keep the tumbler discs in operating position with clearance for free operation. It was previously mentioned that the portion 47*b* of the plug member 47 carries fast thereon a cam 60. Within the lock casing 30 is a flanged internal back plate 61, previously mentioned, which is shown in detail in FIG. 5. Said back plate has a rearwardly projecting protuberance 62 extruded therefrom and which is positioned adjacent the high side of the cam 60 when the cam is in the unturned position of FIG. 3 and which will then prevent axial movement of said cam and the parts associated therewith toward the left relative to FIG. 3. It might be observed at this point that when the cylinder 49 and other mechanism of the lock are operated by a turning movement of the inserted key 54 to by-pass the permutation mechanism, the notched disc driver plate 42 remains relatively rearwardly in the deep opening 43 therefor in the rear end of the knob and dial assembly, and the cam 60 remains substantially rearwardly of the main surface portion of the back plate 61. When the lock is to be released without dialing, the inserted key 54 is turned a quarter revolution in a clockwise direction relative to FIG. 1. This also then turns the cam 60 a quarter of a revolution which removes the high side of the cam from adjacency with the protuberance 62 on the back plate, and causes the high side of the cam to bear against the shouldered end portion of the locking slide 59 which resiliently retracts the locking slide from its engagement with a lever locking bar (not shown), and permits the lock bolt 31 to be released, all as is explained in the Foote et al. copending application, Serial No. 15,196, filed March 15, 1960.

At this stage, the combination of the lock may be changed through additional manipulations which are controlled by a rectilinear outward withdrawal of the key 54 while it is still inserted in the plug member 47. An outward pull on the key 54 while it is in the turned position will move the entire plug and cylinder assembly 47 toward the left relative to FIG. 3 so that the disc driver plate 42 occupies the forward position of FIG. 4 within the knob recess 43 and compresses the spring 44 leaving a space 71 at the rear of the cylinder plug and shell. At the same time the fingers 46 on the plate 42 slide within the slotted hub of the first tumbler disc 55*a*. Therefore, the dialing knob is disconnected from the combination setting plate 42. The cam 60, having its high side removed from the protuberance 62 moves forwardly against the surface portion of the back plate 61, as shown in FIG. 4. The forward movement of the disc driver and combination setting plate 42, which is loosely mounted on the portion 47*a* of the plug, is caused by engagement of the annular shoulder 63 at the forward end of the plug section 47*b* with the free ends of the fingers 46. Then, the dialing knob 33 may be manually rotated to new positions relative to the gates or notches in the tumbler discs 55 and 55*a* whereupon the pull on the key 54 may be released or the key may be pushed inwardly and the parts will return to the position of FIG. 3 because of the expansion of the spring 44. Different notches in the periphery of the disc driver plate 42 will then be engaged with the knob carried lugs 40. This readjustment means that the dialing knob 33 will have to be turned through a new set of dialing numbers or graduations to control the permutation mechanism and permit the lock to be released through the new or changed combination.

After the combination is changed in the manner described a rotation of the key 54 in a counterclockwise direction will turn the plug member 47 in a direction to bring the high side of the cam 60 into adjacency with the protuberance 62 on the back plate 61 to maintain the parts in the operative condition of FIG. 3, because axial movement of the plug unit 47 and parts carried thereby is prevented. Upon removal of the key 54 after it has been turn back, the lock is in condition to be operated through dialing the changed combination.

By reference to FIGS. 5 and 11 it will be observed that an enlarged portion of the plug unit 47 is formed with a pair of opposed flattened surfaces 64. These flat surfaces are for the purpose of keeping the cam 60 in register with the plug and inserted key because they fit into corresponding flats in the cam 60. The broken line showing of the cam 60 in FIG. 5 illustrates it in its locked position.

As will be seen from FIGS. 8 and 9, the first tumbler disc 55*a* carries, near its periphery, a rearwardly projecting protuberance 65 which can contact and overlap a protuberance in the next adjacent tumbler disc 55 to effect a driving connection, and the same arrangement occurs as between the last-mentioned disc 55 and the disc 55 thereadjacent.

Insofar as the principles of the present invention are concerned, the direction of opening of the locker door

and the consequent positioning and direction of the lock applied thereto, are immaterial. In FIGS. 1 and 2 the locker door **20** is illustrated as one which is hinged along its right-hand margin and the lock is applied to the opposite margin of the door. However, FIG. 16 illustrates a locker or cabinet door which opens in a reverse direction, and the lock applied thereto has its bolt and mechanism reversed over that shown in FIGS. 3 and 4.

Although the lock mechanism is a master key controlled permutation lock and is, therefore, susceptible of being opened through the dialing of the correct combination or through the use of a master key, it incorporates a simple accessible mechanism which, when the master key is inserted in the plug unit **47** and turned, removes the high side of the cam **60** from its blocked position and permits an axial movement of the plug unit and parts carried thereby through a pull imposed on the key **54**. This disengages the knob carried combination setting plate **42** whereupon turning movements of the dial knob will result in an altered position of said plate relative to the knob lugs **40** after the plug unit **47** is pushed axially back to its normal position, whereby a changed combination results. Thus, the combination of the lock is easily changed through the use of the control key and a manual push and pull action imparted thereto while the key is in the keyway of the lock plug. The combination changing is effected without in any manner disassembling the lock, nor need the lock or knob be loosened. The key operated cylinder shell **47***c*, being in the rear of the lock casing instead of in the knob, cannot be readily reached by a tamperer and it is unlikely that blows on the dialing knob will affect the cylinder or its operation. The unique type of control or master key utilized serves a dual purpose. It functions to open the lock without dialing and for use in effecting combination changes. Additionally, the unusual elongated key is difficult to imitate or duplicate.

The numbers assigned for a given combination in the improved lock are scrambled with the result that a tamperer cannot easily determine the plan or code in effect. The newly assigned combinations need not be uniform multiples of numbers added to or substracted from the original combination and the combinations may be changed to many rearranged staggered combinations.

The improved key controlled, combination changing permutation lock, especially suited for lockers, cabinets and the like, is easy to assemble and install, is strong, durable and tamper-proof, may be easily and expeditiously handled or operated by an unskilled person and is well adapted for the purposes described.

What is claimed as the invention is:

1. In combination, a lock casing, a dialing knob rotatably associated therewith, lock bolt movement controlling mechanism within said casing, permutation mechanism for operating said lock bolt movement controlling mechanism within the lock casing, a key receiving plug, means axially shiftably and rotatably mounting the plug in the casing with an end portion of the plug extending coaxially into the dialing knob, the latter having an opening therein to permit the insertion of a key into the plug, means, including the plug, forming an operating connection between the dialing knob and permutation mechanism, other means moved by a key turned operation of the plug for also operating said lock bolt movement controlling mechanism, and means within the casing and remote from the dialing knob, released by a key turned operation of the plug to normally prevent axial movement thereof, an axial shift of the plug in one direction when said means is released breaking the operating connection between the dialing knob and permutation mechanism to permit a rearrangement of the same for combination changing purposes.

2. In combination, a lock casing, a lock bolt, lock bolt controlling mechanism within the casing, a dialing knob rotatably associated with said casing, permutation mechanism within the lock casing for operating said lock bolt controlling mechanism, a key receiving plug, means axially shiftably and rotatably mounting the plug in the casing with an end portion of the plug extending into the dialing knob and turnable relative thereto, the knob having an opening therein to permit the insertion of a key into the plug, spring means normally biasing the plug inwardly, said lock bolt controlling mechanism being operated by key turned movements of the plug, means including the plug, forming an operating connection between the dialing knob and permutation mechanism when said plug is biased inwardly, and means released by a key turned operation of the plug to normally prevent axial movement thereof, an axial pull of the plug in an outward direction when said means is released by a key turned operation of the plug breaking the operating connection between the dialing knob and permutation mechanism to permit a rearrangement of the same for combination changing purposes, operation of said plug both for operation of said lock bolt controlling mechanism and for combination changing being accomplished by the same key.

3. In combination, a lock casing, a dialing knob rotatably associated therewith, lock bolt controlling mechanism within the casing, permutation mechanism within the lock casing for operating the lock bolt controlling mechanism, a key receiving cylinder plug, means axially shiftably and rotatably mounting the plug in the casing with an end portion of the plug extending into the dialing knob, the latter having an opening therein to permit the insertion of a key into the plug, spring means normally biasing the plug inwardly, a plate carried by the plug and selectively engageable with the dialing knob, said plate and plug forming an operating connection between the dialing knob and permutation mechanism when said plug is biased inwardly, other means operated by a key turned movement of the plug for operating the lock bolt controlling mechanism independently of the permutation mechanism, a protuberance within the casing, and a projection carried by an inner portion of said plug and normally registering with said protuberance to prevent axial movement of the plug, the plug, when turned by an inserted key, also removing said projection from asid protuberance and permitting the plug to be pulled axially outwardly to break the operating connection between the dialing knob and permutation mechanism by disengaging the plug-carried plate from the dialing knob whereby a rearrangement of the engagement between the plate and knob may be effected for combination changing purposes.

4. In a lock having lock bolt controlling means including permutation mechanism and a key operated mechanism, the latter including an elongated axially shiftable and turnable key-receiving plug and the permutation mechanism including an anchored sleeve with tumbler discs operatively mounted thereon, the plug being axially shiftably and rotatably mounted in the sleeve in response to movement manually applied to a key inserted in said plug, a turnable dialing knob, and a connector carried by said plug and selectively adjustably engaging the dialing knob and engageable with the tumbler discs to provide a driving connection between the dialing knob and tumbler discs, axial shifting of the plug by an applied key disengaging said connector from the dialing knob whereby the relationship of the dialing knob to the connector may be varied for combination changing purposes when the knob is turned and the plug is shifted axially to its original position to re-connect the connector with the dialing knob and tumbler discs.

5. In a key controlled combination lock formed with a casing having therein lock bolt controlling means including tumbler discs and a key operated mechanism, the latter including an elonagted key-receiving plug, a sleeve mounting the plug within the casing for key actuated turning movement and for axial movement when a pull is imposed on the plug inserted key to shift the plug in said sleeve from an inner position to an outer position,

the tumbler discs being operatively mounted on the sleeve, a turnable dialing knob, and a connector carried by said plug and selectively adjustably engaging the dialing knob and engaging the tumbler discs to provide a driving connection between the dialing knob and tumbler discs, an axial shift of the plug from its inner to its outer position after it has been turned by an inserted key disconnecting said connector from the dialing knob whereby the relationship of the dialing knob to the connector may be selectively altered for combination changing purposes when the knob is turned and the plug is re-shifted axially to its original inner position to re-connect the connector with the dialing knob, the key which is inserted in the plug functioning to turn the plug for operating the lock bolt controlling means and to thereafter shift the plug axially for combination changing purposes.

6. In a lock having a casing with permutation mechanism including tumbler discs housed therewithin, a cupped dialing knob rotatably associated with the casing and having an opening in its outer end, a sleeve anchored within the casing, a key-receiving cylinder plug rotatably mounted in the sleeve with an end portion thereof in registration with the outer end opening in the dialing knob for insertion of a control key, said sleeve operatively carrying the tumbler discs, the plug being axially shiftable in the sleeve from its normal inner position to an outer position when turned, a disc driver plate rotatably mounted on the plug adjacent a tumbler disc, the disc driver plate and dialing knob having cooperative registering means for effecting a pre-selected driving connection between the knob and driver plate when the plug is in its normal inner position, said plate having means to drivingly engage the tumbler discs, and stop means connected with the inner end portion of the plug for normally blocking axial movement of the plug but movable to an inoperative position when the plug is turned by an inserted key whereby the plug may be pulled axially outwardly to disengage the driver plate from the dialing knob permitting the combination of the permutation mechanism to be changed through a turning of the dialing knob followed by an axial shift of the plug back to its normal inner position.

7. In combination, a lock casing, a dialing knob rotatably associated therewith, permutation mechanism within the lock casing, an elongated key receiving plug extending into the casing and having a pin cylinder on its inner end, means axially shiftably and rotatably mounting the plug in the casing with a forward end portion of the plug extending into the dialing knob, the latter having an opening therein to permit the insertion of a key into the plug, spring means normally biasing the plug inwardly, a disc driver plate carried by the plug and selectively connectable with the dialing knob, said plate and plug forming an operating connection between the dialing knob and permutation mechanism when said plug is biased inwardly, a protuberance within the casing, and a cam carried by an inner end portion of said plug and normally registering with said protuberance to prevent axial movement of the plug, the plug, when turned by an inserted key, removing said cam from said protuberance and permitting the plug to be pulled axially outwardly by said inserted key to break the operating connection between the dialing knob and permutation mechanism by disengaging the disc driver plate from the dialing knob whereby a rearrangement of the engagement between said plate and the knob may be effected for combination changing purposes.

8. A key controlled, combination changing permutation lock comprising, a lock casing, a dialing knob rotatably associated therewith, a sleeve anchored within the casing, permutation mechanism including notched tumbler discs within the lock casing, a key receiving shouldered plug having a pin cylinder on its inner end, the plug being axially shiftably and rotatably mounted in the sleeve with a forward end portion of the plug rotatably and axially shiftably extending into the dialing knob, the latter having an opening therein to permit the insertion of a key into the plug, said tumbler discs being operatively mounted on said sleeve, spring means normally biasing the plug axially inwardly, a disc driver plate carried by the plug and selectively connectable with the dialing knob, said plate and plug forming an operating connection between the dialing knob and permutation mechanism when said plug is biased inwardly, a protuberance within the casing, and a cam carried by an inner portion of said plug and normally registering with said protuberance to prevent outward axial movement of the plug, the plug, when turned by an inserted key, turning said cam free of said protuberance and permitting the plug to be pulled axially outwardly by the inserted key to break the operating connection between the dialing knob and permutation mechanism by disengaging the disc driver plate from the dialing knob whereby a rearrangement of the engagement between said plate and the knob may be effected for combination changing purposes.

9. In a lock having a movable lock bolt, permutation mechanism for moving said lock bolt including: tumbler discs operatively connected with said lock bolt moving mechanism, a dialing knob, an axially shiftable and turnable elongated cylinder plug, a disc driver plate carried by said cylinder plug adjacent to and engaged with a tumbler disc, the disc driver plate being selectively connected with the dialing knob whereby the disc driver plate will transmit rotation from the dialing knob to the tumbler discs when engaged with the same and according to a preselected combination, said plate and dialing knob being formed with complementary means for varying the point of angular engagement between the two; independent key operated mechanism including said cylinder plug for moving said lock bolt; and means controlled by the turning of the cylinder plug through a key inserted therein for effecting an axial movement of the plug and plate to disengage the plate from the dialing knob whereby an angularly varied re-engagement between said dialing knob and driver plate may be effected for changing the combination of the lock permutation mechanism.

10. In combination, a lock casing, a dialing knob rotatably associated therewith, lock bolt movement controlling mechanism within said casing, permutation mechanism for operating said lock bolt movement controlling mechanism within the lock casing, a key receiving plug, means axially shiftably and rotatably mounting the plug in the casing with an end portion of the plug extending co-axially into the dialing knob, the latter having an opening therein to permit the insertion of a key into the plug, the plug being axially movable from a first inner position to a second outer position, means, including the plug, forming an operating connection between the dialing knob and permutation mechanism when said plug is in said first position, and means disengaging the operating connection between the dialing knob and the permutation mechanism when the plug is turned and axially shifted to said second position by a key applied thereto, whereby a rearrangement of the permutation mechanism can be effected for combination changing purposes.

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