Jan. 1, 1935. J. H. SHAW ET AL 1,986,452

DETACHABLE LOCK MECHANISM

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Fig. 1.

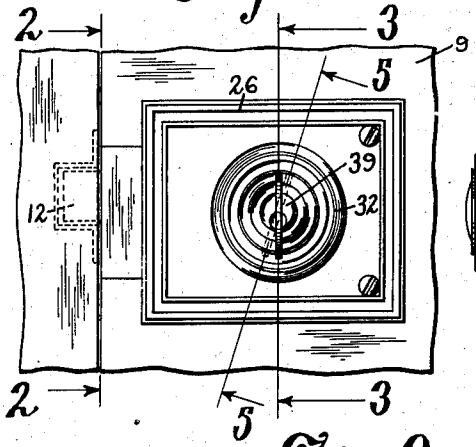


Fig. 2.

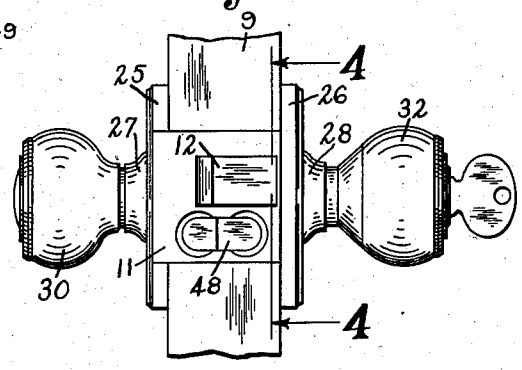


Fig. 3.

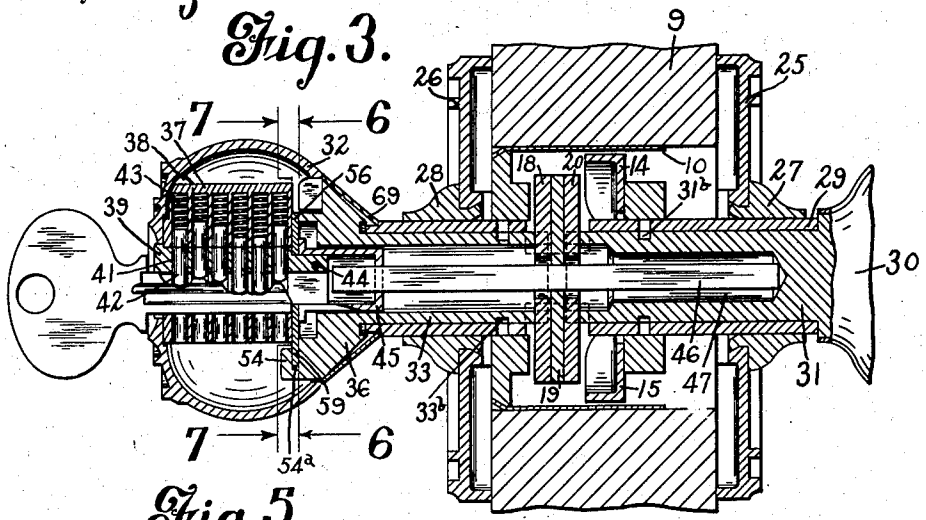
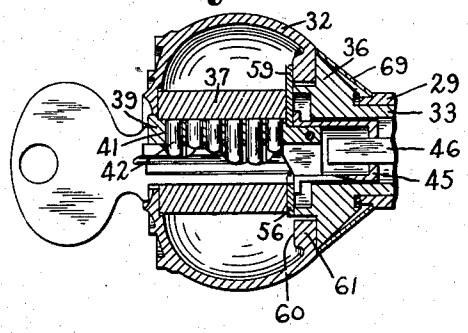


Fig. 5.



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Fig. 4.

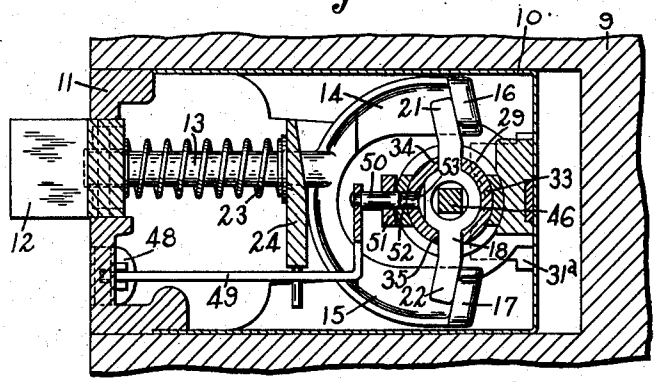


Fig. 6.

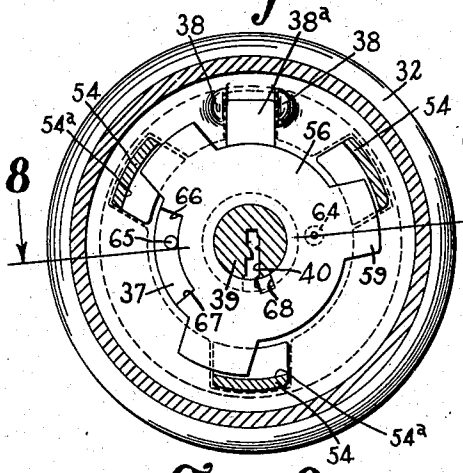


Fig. 7.

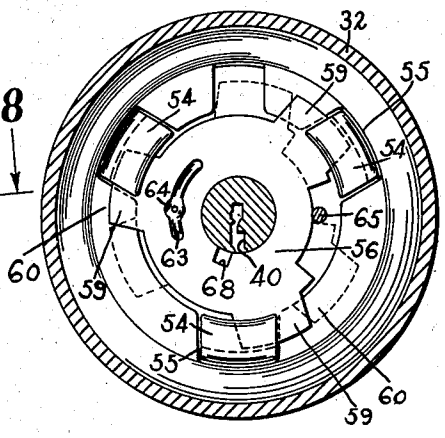
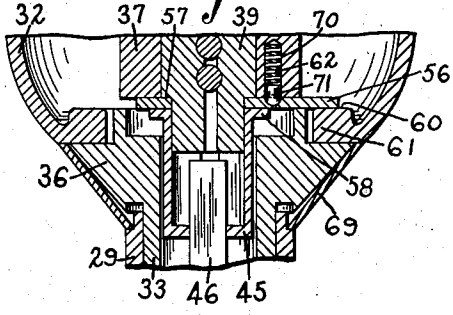


Fig. 8.



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UNITED STATES PATENT OFFICE

1,986,452

DETACHABLE LOCK MECHANISM

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Application May 17, 1928, Serial No. 278,546

36 Claims. (Cl. 70—91)

Our invention relates to a detachable lock mechanism, and more especially to a lock mechanism in which the detachment thereof is under the control of a key.

It has heretofore been proposed to provide detachable tumbler mechanisms for locks in which the detachment of the mechanism is under the control of a key. In the detachable lock mechanisms heretofore known, especially in pin tumbler locks, it has generally been the practice to provide a secondary locking system which holds the pin tumbler mechanism in the lock case. This secondary locking system is usually under the control of the pin tumbler mechanism, the pin tumblers of which are usually provided with a plurality of breaks or shears, one set of which may be brought into alignment with the surface of the key plug to permit the rotation of the latter by a suitable key during the normal operation of the lock, while another set is brought into alignment in the secondary locking system by a special key to effect the unlocking of this system and the detachment of the pin tumbler mechanism.

It is, in general, an object of the present invention to provide a detachable lock mechanism in which the detachment of the mechanism may be under the control of a key, and in which no special form of tumbler mechanism need be employed, thus avoiding the complicated tumbler mechanisms of the prior locks and bringing about a simpler form of lock less apt to get out of order.

Another object of the invention is to provide a detachable lock mechanism in which the tumblers of the lock are aligned in the same manner in detaching the lock mechanism as they are during the normal operation of the lock.

Still another object of the invention is to bring about a lock mechanism of the above character which is provided with a secondary locking system, the operation of which may be effected by a key inserted into the usual key opening.

In a more specific aspect, the invention contemplates a form of locking mechanism for a door or the like, in which the tumbler mechanism is carried within the handle of the door, and in which the tumbler mechanism may be made readily accessible in order to change the combination of the lock, or for other purposes.

A further object of the invention is to provide a knob for a lock mechanism of a door or the like in which the tumbler mechanism is carried in the knob, the knob being separable into a plurality of parts to permit the detachment of the tumbler mechanism, and in which the detachment of the knob parts is under the control of a key or the like.

A still further object of the invention is to provide a lock for a door or the like, in which the tumbler mechanism is carried in the handle of the door, the handle being normally secured to the lock mechanism but at least in part detachable therefrom by means of a suitable key inserted into the tumbler mechanism, the latter being readily dismountable from the knob, upon detachment of the latter, without the use of any tool or tools.

To these and other ends, the invention consists in the novel features and combination of parts to be hereinafter described and claimed.

In the drawings,

Fig. 1 is a fragmentary view of a door having a lock in accordance with my invention mounted thereon;

Fig. 2 is a view along line 2—2 of Fig. 1;

Fig. 3 is a sectional view along line 3—3 of Fig. 1, but on an enlarged scale;

Fig. 4 is a sectional view along line 4—4 of Fig. 2, but on an enlarged scale;

Fig. 5 is a sectional view along line 5—5 of Fig. 1, but on an enlarged scale;

Fig. 6 is a sectional view along line 6—6 of Fig. 3, but on an enlarged scale;

Fig. 7 is a sectional view along line 7—7 of Fig. 3, but on an enlarged scale; and

Fig. 8 is a sectional view along line 8—8 of Fig. 6.

We will now describe our invention in connection with the preferred embodiment thereof shown in the drawings in which we have shown our improved form of detachable lock mechanism when used in connection with a separable door knob, although it will be readily understood as the description thereof proceeds that in certain aspects the invention is not limited to use in a separable knob but has a much broader scope.

Referring to the drawings, the reference numeral 9 indicates in general a door having mounted therein a lock case 10 provided with a wall 11 in which is mounted a pivoted latch bolt 12 provided with a stem 13 and lateral portions 14 and 15 on which are integrally formed lugs 16 and 17. Mounted in lock case 10 are a plurality of rollbacks 18, 19 and 20 provided with talons, as, for example, talons 21 and 22 of rollback 18, which upon rotation of the rollback come into contact with lugs 16 or 17, depending upon the direction of rotation of the rollbacks, to retract latch bolt 12, the latter being normally

urged into protracted position by compression spring 23, mounted on stem 13 between transverse portion 24 of lock case 10 and pivoted latch bolt 12.

On either side of the door knob are escutcheon plates 25 and 26, having mounted therein, preferably in a permanent manner, collars 27 and 28, and mounted in collars 27 and 28 and extending transversely of lock case 10 is a tubular element 29 secured against displacement in lock case 10, in a manner to be hereinafter fully pointed out. On one side of door 9, is a handle 30 provided with a shank 31 received within the adjacent end of tube 29, while at the opposite side of door 9 is a handle 32 provided with a shank 33 received within the opposite end of tube 29. The inner end of shank 33 is provided with openings 34 and 35 in which are received talons 21 and 22 of rollback 18, while shank 31 is provided with similar openings for the reception of talons on rollback 20. Shank 33 is connected to handle 32 by a radially extending part 36, in a manner to be hereinafter fully pointed out.

In the interior of handle 32 is a cylinder lock 37 secured against rotational displacement in the handle 32 by means of lugs 38 on handle 32 between which is received a lug 38^a on cyliinder lock 37. Mounted in cylinder lock 37 is a key plug 39, provided with the usual key opening 40 and a plurality of spaced openings 41, which, together with a similar number of openings in the cylinder lock case, receive the pin tumbler sections 42 and springs 43. At its inner end key plug 39 is secured by means of pin 44 to thimble 45, having received in a square opening therein a square rod 46 which extends through a similarly shaped opening in rollback 19 and into the opening 47 in handle 31.

Mounted in wall 11 of lock case 10 is a pivoted lever 48 connected by means of rod 49 to a locking pin 50 mounted in a suitable opening in transverse lock case part 51 and adapted to be received in openings 52 and 53 of tubular part 29 and shank 33, respectively. The end of locking pin 50 is always received in the opening 52 in tubular part 29, as indicated in Fig. 4 of the drawings, locking pin 50 serving to prevent movement of tubular part 29 in lock case 10. Handle shanks 31 and 33 are held against movement in an axial direction by means of keys 31^a of which but one is shown, keys 31^a being mounted in lock case 10 and extending into grooves 31^b and 33^b of shanks 31 and 33, respectively.

The normal operation of the lock will be readily understood from the above description and may be briefly described as follows: The latch bolt 12 may be retracted at all times by handle 30, which is on the interior of the door, by means of the connection between shank 31 and rollback 20, while the latch bolt 12 may be retracted by means of handle 32, through the connection between its shank and rollback 18, at all times except when the shank 33 is dogged against movement by locking pin 50 being inserted into the opening 53 in shank 33, whereupon the handle 32 is locked against movement. In this condition of the lock mechanism, the latch bolt 12 may only be retracted from the exterior of the door by means of a suitable key inserted into the tumbler mechanism. Upon the insertion of a suitable key in the tumbler mechanism the shears in the pin tumblers are brought into alignment with the surface of the key plug, whereupon the latter may be rotated by means of the key and through the rod 46 the rollback 19 is rotated to retract the latch bolt.

Up to this point in the description of our invention we have been concerned with those features which enter into the normal operation of the lock. It is highly desirable, however, to provide a lock mechanism in which the tumbler mechanism may be readily detached to change the combination of the lock, or for other purposes, and we will now describe those features of our invention which provide a suitable means to that end.

Referring again to the drawings, it will be seen that the transverse part 36 of shank 33 is provided with a plurality of circumferentially spaced lugs 54, received within openings 55, in handle 32, while on key plug 39 is a substantially disk-like element 56 mounted between shoulder 57 of key plug 39 and flanged portion 58 of thimble 45 which prevents axial movement of the disk-like element 56. Disk 56 is provided with a plurality of radially extending lugs 59 which, during the normal operation of the lock, are in engagement with the surfaces 60 of lugs 61 on handle 32 and are received in openings 54^a in shank lugs 54, thus preventing the knob 32 from moving outwardly in an axial direction from shank part 36. Mounted in opening 70 of cylinder lock case 37 is a plunger 71 forced by spring 62 against disk 56, which is provided with a groove 63 in which the plunger rides during the operation of the secondary locking system, disk 56 being provided with an opening 64 in groove 63 in which the plunger is received during the normal operation of the lock mechanism to hold the disk against movement relative to cylinder lock case 37. A stop pin 65, mounted in cylinder lock case 37 cooperating with shoulders 66 and 67 of disk 56, limits the rotary movement of the disk on key plug 39. Disk 56 is provided with an opening 68 in which the end of a suitable key may be received, opening 68 being normally out of alignment with the key opening 40 in key plug 39, as shown in Fig. 7. In order to conceal the lugs on handle 32 and shank part 36, a shroud 69 is provided which is mounted on and extends from the end of tube 29 to the adjacent end of handle 32.

In dismounting the cylinder lock from the handle, the operation is as follows: A suitable key, such as that disclosed and claimed in the patent of John H. Shaw, #1,821,361, September 1, 1931, is inserted into the key plug into a position in which the notches in the key bit bring the pin tumblers into alignment with the surface of the key plug and the inner end of the key is in engagement with disk 56, as shown in Fig. 3. The key and key plug are now rotated into the position shown in dotted lines in Fig. 1 to bring the key into position opposite the opening 68 in disk 56, whereupon the key is inserted into the key plug into the position shown in Fig. 5, in which the key is shown as received in opening 68 of disk 56. Disk 56 may now be rotated into the position shown in dotted lines in Fig. 7, in which position the lugs 59 of disk 56 are disengaged from openings 54^a in lugs 54 of shank part 36. The handle 32 may now be moved in an axial direction and detached from the shank 33, handle 32 carrying with it the cylinder lock 37.

Upon the changing of the combiantion of the lock or effecting such other changes as may have necessitated the dismounting of the handle 32, the cylinder lock is again assembled in handle 32 with lug 38^a received between parts 38, and

a key according to the above patent, having suitable notches therein for aligning the pin tumblers, is inserted into the key plug and brought into engagement with opening 68 in disk 56. The handle 32 is now assembled on shank 33 and the disk rotated into the position shown in full lines in Fig. 7, in which position plunger 71 is received in opening 64 to hold the disk 56 against rotary movement. The key is now withdrawn axially until the end thereof is no longer received in opening 68, whereupon the key and key plug are rotated into the position shown in full lines in Fig. 1, whereupon the key may be withdrawn from the lock.

From the foregoing description of the nature of our invention and its mode of operation, it will be readily understood that we have provided a relatively simple form of detachable lock mechanism in which a usual form of tumbler mechanism may be used, thus avoiding the troubles usually experienced through the use of pin tumblers having a plurality of breaks or shears. It will also be apparent that the parts of the secondary locking system are arranged in a manner wherein they are inaccesible except through the use of a special key, and thus the lock may not be tampered with by one seeking to force the same. The parts of the secondary locking system are simple and thus are not apt to become out of order. While we have shown as a preferred embodiment of our invention, a detachable lock mechanism mounted in a door knob, it will be readily understood by one skilled in the art that the features of our invention are such that it may be incorporated in other types of locks.

It will be seen that the portion 32 of the knob and the part 36 on the shank constitute together a lock case or housing, within which the pin tumbler lock mechanism is mounted, the part 32 serving as the main part of the case and the part 36 serving as a cover whereby when the two parts are secured together they form a closed case about the locking mechanism.

While we have shown a preferred embodiment of our invention, it is to be understood that the same is not to be limited to all the details shown but is capable of modification and variation within the spirit of the invention and the scope of the appended claims.

What we claim is:

1. In a lock, a two part lock casing, a unitary lock mechanism mounted between said parts and separable as a unit therefrom and rotatable means controlled by the lock mechanism for locking said parts together.

2. In a lock, a two part casing, lock mechanism mounted within said casing between said parts, and rotatable means controlled by the lock mechanism for locking said parts together, said means being engageable by a key received in the lock mechanism to be rotated into releasing position.

3. A lock, comprising a two part lock case and locking mechanism housed between said parts, said mechanism including an element rotatable by a key to release said parts for detachment from one another and said locking mechanism from between said parts.

4. In a lock, a case, lock mechanism mounted in the case, a removable cover for the case permitting access to the lock mechanism, and means controlled by the lock mechanism and rotatable by a key to lock the cover to the case against movement with respect thereto.

5. In a lock, a lock casing, said casing including two separable parts, a unitary lock mechanism mounted within the casing between said parts and detachable as a unit therefrom when the parts are separated; and means engaging both parts to prevent relative movement therebetween, said means being rotatable by a key received in the lock mechanism to release the parts for separation.

6. In a lock, a lock casing, said casing including two parts, a lock mechanism mounted between said parts and freely detachable therefrom, means on said lock mechanism engaging both parts to prevent relative movement therebetween, said means being rotatable by a key into part releasing position.

7. In a lock, a lock casing, said casing including two separable parts, a unitary lock mechanism mounted within the casing between said parts and detachable as a unit therefrom when the parts are separated; and means on said lock mechanism engaging both parts to prevent relative movement therebetween, said means being rotatable by a key received in the lock mechanism to release the parts for separation.

8. In a lock, a two part case provided with overlapping ends, lock mechanism mounted in said case between said parts and means engaging said overlapping ends to secure the parts of the case together, said means being movable by a key into position to release said parts for separation.

9. In a lock, a two part case provided with overlapping ends, lock mechanism mounted in said case and rotatable means engaging said overlapping ends to secure the parts of the case together, said means being rotatable by a key into position to release said parts for separation, the lock mechanism being freely detachable from the case parts when the latter are separated.

10. In a lock mechanism for a door, a door handle, said handle being provided with a shank and a body, a spindle connected to said body and extending through said shank, key operable means normally locking said shank to the body, said means being operable by a key of proper shape and movable thereby into unlocking position.

11. In a lock mechanism for a door, a door handle, said handle being provided with a shank and a body, lock mechanism mounted between said shank and body, means normally locking said shank to the body, said means being movable by a key into unlocking position.

12. In a lock mechanism for a door, a door handle, said handle being provided with a shank and a body, lock mechanism mounted between said shank and body, means normally locking said shank to the body, said means being movable into unlocking position by a key received in the lock mechanism.

13. In a lock, a two part lock case, tumbler mechanism mounted in said case and freely separable from the parts thereof, said mechanism including a key plug, and means on said key plug for locking the parts of the lock case together with the tumbler mechanism mounted therein.

14. In a lock, a two part lock case provided with overlapping parts, tumbler mechanism mounted in said case and separable as a unit from the case parts, said mechanism including a key plug and means on said key plug for locking the parts of the lock case together, said means being engageable by a key inserted in the key plug to be moved into unlocking position.

15. In a lock, a two part lock case provided with overlapping parts, tumbler mechanism mounted

in said case and detachable as a unit from the parts of the case when the latter are unlocked from one another, said mechanism including a key plug and rotatable means on said key plug for locking the parts of the lock case together with the tumbler mechanism mounted therebetween, said means being engageable by a key inserted in the key plug to be moved into unlocking position.

16. In a lock, a two part lock case, lock mechanism in said case, said lock mechanism being freely removable from the parts of the case when the latter are detached from one another, a rotatable disc in said case normally engaging said parts to lock them together, said disc being rotatable by a key into position to unlock the parts of the case for detachment from one another.

17. In a lock, a two part lock case, lock mechanism in said case and separable as a unit therefrom, a rotatable disc in said case normally engaging said parts to lock them together, said disc being rotatable by a key inserted in the lock mechanism into unlocking position.

18. In a lock, a two part lock case, lock mechanism mounted in said case between said parts, said mechanism including a key plug, a rotatable disc mounted on said key plug, said disc normally locking the parts of the lock case together but being rotatable into unlocking position by a key inserted in the key plug.

19. In a lock, a two part lock case, lock mechanism mounted in said case between said parts, said mechanism including a key plug, a rotatable disc mounted on said key plug, said disc normally locking the parts of the lock case together but being rotatable into unlocking position by a key inserted in the key plug, and means for holding said disc against movement during the normal operation of the lock.

20. In a lock for a door or the like, a door handle, said handle being provided with a hollow body portion and a separable shank, lock mechanism mounted between said body portion and shank, said lock mechanism including a key plug and a rotatable element on said key plug engaging the body portion and shank to normally lock them together, said element being rotatable by a key inserted in the lock mechanism into unlocking position.

21. In a lock for a door or the like, a door handle, said handle being provided with a hollow body portion and a separable shank, lock mechanism mounted between said body portion and shank, said lock mechanism including a key plug and a rotatable element on said key plug engaging the body portion and shank to normally lock them together, said element being rotatable by a key inserted in the lock mechanism into unlocking position, and means for holding said element against rotation during the normal operation of the lock.

22. A two part door handle having locking mechanism mounted therein, said mechanism being accessible for removal upon detachment of said parts, said mechanism including a key plug, and means rotatably mounted on said plug for locking the parts of the handle together, said key plug and means mounted thereon being connected by a key for rotation together.

23. A two part door handle having locking mechanism mounted therein, said mechanism being accessible for removal upon detachment of said parts, said mechanism including a key plug, and means rotatably mounted on said plug for locking the parts of the handle together, said key plug being rotatable independently of and also similarly with said means.

24. In a lock, a lock casing, said casing including two separable parts, means engaging both parts to prevent relative movement therebetween, said means being rotatable by a key to release the parts for detachment from one another, and a lock mechanism mounted between said parts and freely detachable from both of said parts when the latter are released from one another.

25. In a lock for a door, a two part case provided with overlapping ends, one of the parts being adapted to be mounted on the door, locking mechanism mounted between said parts and having an operative portion thereof extending into the part adapted to be mounted on the door, the other of said parts serving to hold the locking mechanism in operative position with respect to the first of the parts, and means engaging said overlapping ends to secure the parts of the case detachably together, said means being movable by a key inserted into the locking mechanism into position to release the parts of the case for separation.

26. In a lock, a two part casing, locking mechanism mounted within said casing between said parts and freely separable as a unit therefrom, and rotatable means controlled by the lock mechanism for locking said parts together with the locking mechanism mounted therebetween, said means being engageable by a key received in the locking mechanism to be rotated into position to unlock said parts from one another.

27. In a lock, a two part lock case provided with overlapping ends, tumbler mechanism mounted in said case and separable as a unit from the parts thereof, said mechanism including a key plug, and means on said key plug for locking the parts of the case together, and the tumbler mechanism in one of said parts, said means being engageable by a key inserted in the key plug to be moved into position to unlock the parts of the case from one another and the tumbler mechanism from said part.

28. In a lock, a two part lock casing, a unitary locking mechanism mounted between said parts and freely separable as a unit therefrom, and rotatable means controlled by the locking mechanism for releasably locking said parts together with the locking mechanism mounted therebetween.

29. In a lock, a two part casing, locking mechanism detachably mounted within one of said parts, and combined means for holding said locking mechanism in said part and locking the two parts of the case together, said combined means being engageable by a key inserted in the locking mechanism to be moved into position to release the casing parts for detachment from one another and the locking mechanism from said part.

30. In a lock mechanism for a door, a door handle, said handle being provided with a shank and a body, means carried by the lock mechanism and inaccessible from the exterior thereof for locking said shank to the body, key operable means adapted to be actuated by a key of proper shape to move said first named means to lock said shank to the body, said first named means being movable into unlocking position by such a key inserted in the key operable means.

31. In a lock mechanism for a door, a door handle, said handle being provided with a shank and a body, key operable mechanism mounted in said body including a tumbler mechanism, and means actuated by said key operable mechanism

for locking said shank to said body, said means being movable into unlocking position by a key of proper shape to set the tumbler mechanism inserted in the key operable mechanism.

32. The combination with the spindle in a lock of a knob on the spindle and a rotatable key-actuated means in the knob and spindle to secure the knob against removal from the spindle.

33. A lock comprising in combination, a shank, a knob, a lock casing within said knob, a plug rotatably mounted within said casing, a rotatable means on said plug but held against axial movement thereon, lugs on said means adapted upon rotation to engage or disengage with recesses formed within said shank, said plug being key operable independently of said means, and said plug and means being key operable together to engage and disengage said lugs.

34. In a lock, a knob, a lock casing within said knob, a shank to be secured to a door, said knob and shank having respectively integral interengaging portions to prevent relative rotation thereof, and key actuated means carried by said lock casing for locking said knob and shank together.

35. In a cylinder lock, a casing, a core in said casing, key controlled means for releasably retaining said core in said casing, said means including spaced elements between which the core is received, and means for locking said elements together.

36. A door lock comprising a casing, a lock core removably mounted in the casing and containing a rotatable key barrel, a tumbler mechanism to control the rotation of the barrel, and key controlled means in the casing beyond the core to lock the core to the casing.

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