R. SCHOELL.

LOCK.

APPLICATION FILED NOV. 11, 1913.

1,116,929.

Patented Nov. 10, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

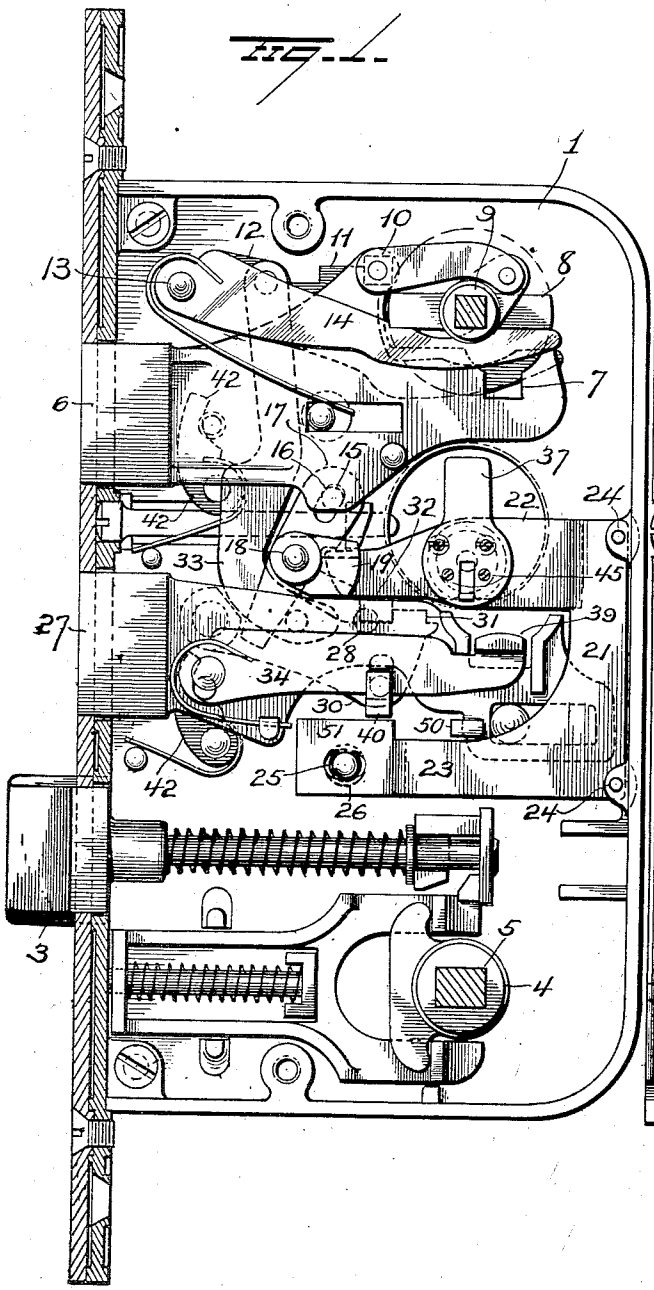
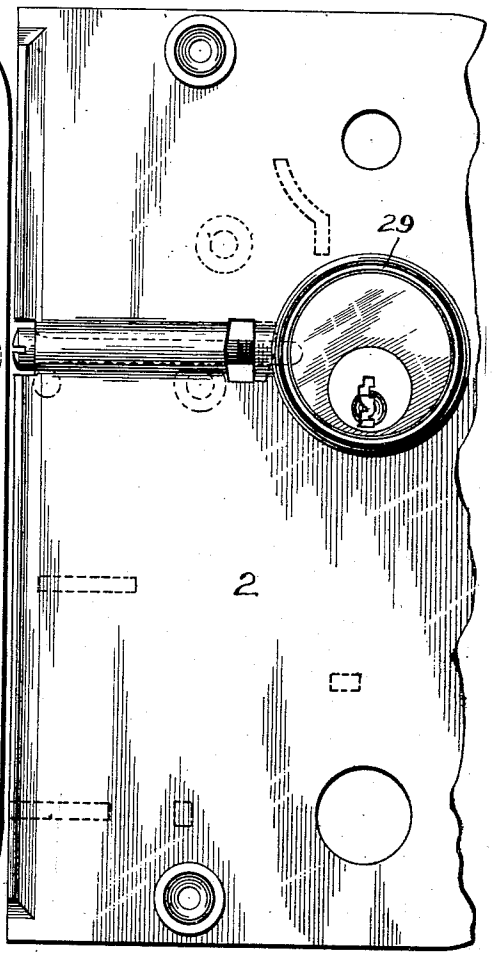


Fig. 2.



WITNESSES

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Fig. 3.

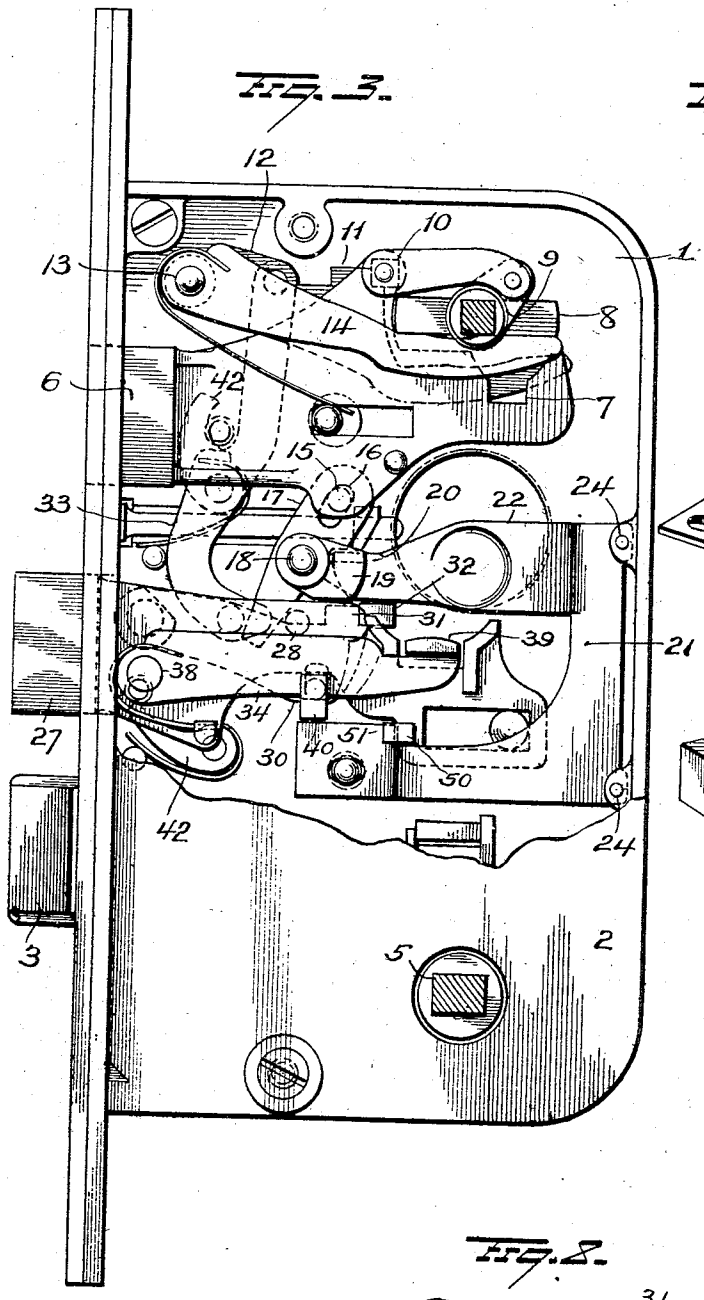


Fig. 4.

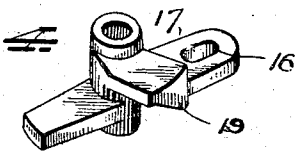


Fig. 5.

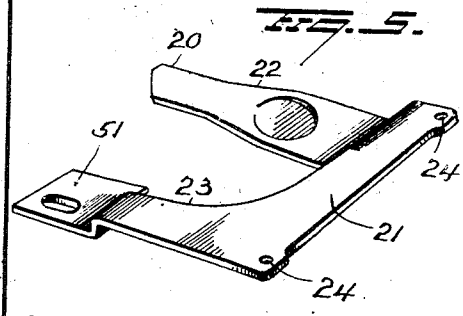


Fig. 6.

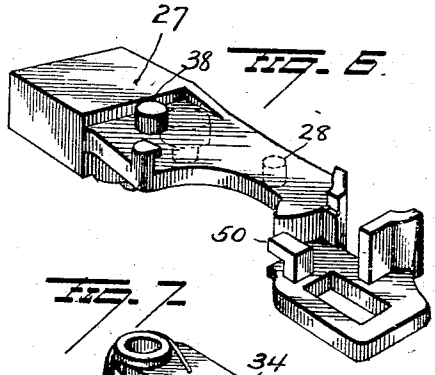


Fig. 7.

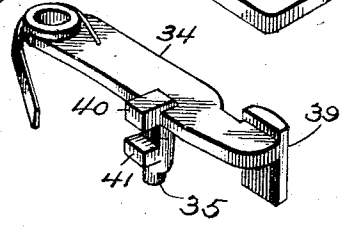
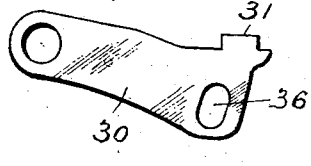


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

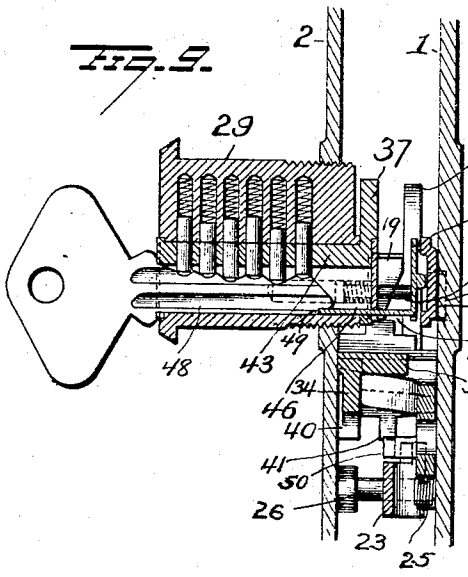


Fig. 10.

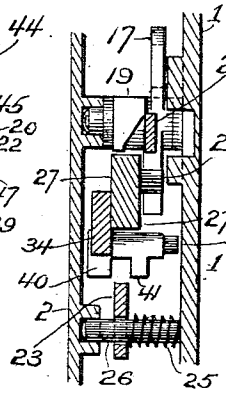


Fig. 11.

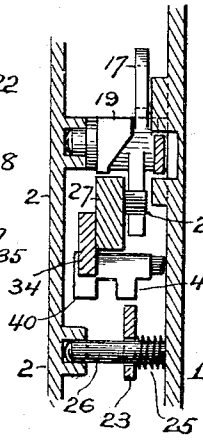


Fig. 12.

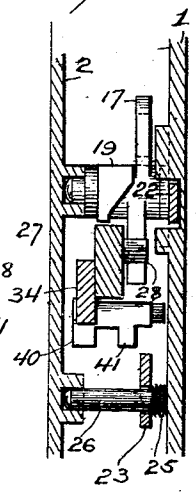


Fig. 13.

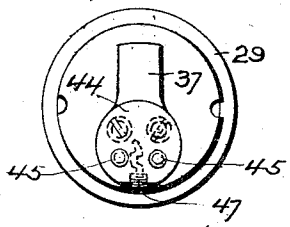


Fig. 14.

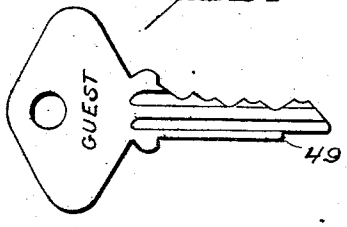


Fig. 15.

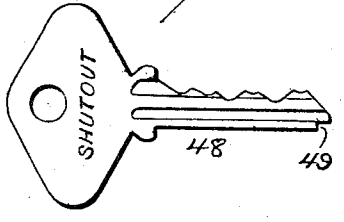
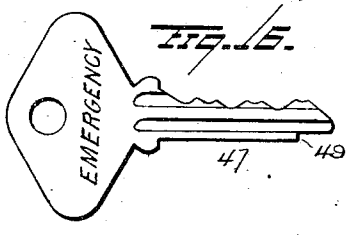


Fig. 16.



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UNITED STATES PATENT OFFICE.

REINHOLD SCHOELL, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD, CONNECTICUT.

LOCK.

1,116,929. Specification of Letters Patent. Patented Nov. 10, 1914.

Application filed November 11, 1913. Serial No. 800,369.

To all whom it may concern:

Be it known that I, REINHOLD SCHOELL, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in locks designed particularly for hotels.

In hotel locks it is the practice to provide mechanisms that may be actuated by a plurality of keys such as a guest key which is adapted for one lock only; a sub-master key adapted for a series of locks, as those on one floor or corridor; and a master key for a greater number or all.

The object of this invention is to combine the devices operated by the several keys, into one mechanism thus simplifying the construction and lessening the chances of the lock getting out of order.

A further object is to provide a lock, which, when locked from the outside of the door by one key of the series, herein referred to as the shut-out key, cannot be unlocked by any other key of the series.

A further object is to provide a lock having two bolts, one adapted to be actuated from the inside and the other from the outside, with mechanism whereby the bolt that is operable from the inside may be retracted from the outside by one of the keys of the series.

With these and other objects in view, my invention consists in the parts and combinations of parts as will be more fully explained and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of the lock, the face plate being removed and both bolts retracted; Fig. 2 is a view in elevation of the face plate and the pin tumbler lock carried by the same; Fig. 3 is a view similar to Fig. 1 showing the lower or outside dead bolt projected; Fig. 4 is a view in perspective of the cam lever; Fig. 5 is a similar view of the emergency and shut-out tumbler; Fig. 6 is a view of the lower dead bolt; Fig. 7 is a view of the tumbler for the latter; Fig. 8 is a view of the locking lever for the lower bolt; Fig. 9 is a view in section through the main lock and also through the pin tumbler lock, showing the tumbler setter projected the limit by the shut out key; Figs. 10, 11 and 12 are views in section showing the several positions of the shut-out tumbler with relation to the cam 19 and the stops 40 and 41; Fig. 13 is a view in rear end elevation of the pin tumbler lock, and Figs. 14, 15 and 16 are views of several of the keys.

1 represents a lock casing and 2 the cover plate secured to same by screws in the usual manner. Mounted within the casing is a latch bolt 3, actuated by the roll back 4 on the knob spindle 5, which passes through the door and may be actuated by a knob at either end.

Located within the casing 1 adjacent the upper end thereof, is the bolt 6, which latter is actuated by a knob or finger turn at the inside of the door, and is not operable from the outer side of the door, except by a special key herein referred to as the emergency key. This bolt 6 is provided with a talon 7 for the cam 8 on the hub 9 of the thumb turn, and is provided on its rear face with a stud 10 which is engaged by a shoulder 11 on the dead locking lever 12, which is pivoted at 13 to the lock casing. When the bolt 6 is retracted, the stud 10 rests against the rear end of shoulder 11, and is held against forward movement thereby, and when the bolt is projected the stud rests against the front face of the shoulder and dead locks the bolt in its locking position. The rear or free end of lever 12 rests in the path of movement of the cam 8 on the hub 9, and when the latter is turned, it first engages the free end of lever 12 and depresses same to release the stud 10, and then enters the talon in the bolt and projects the latter. After the bolt 6 has been projected, the locking lever assumes its normal position with its stud 10 in front of shoulder 11 and locks the bolt. The cam 8 is kept properly centered and prevented from accidental turning by the spring actuated lever 14, which is pivoted at 13 and bears at its rear end against the cam 8. The bolt 6 is also provided with the stud 15, which rests in elongated slot 16 of the cam lever 17. This lever 17 is journaled on pin 18 fixed to the lock case, and is provided with a cam 19 projecting rearwardly from its hub, the said cam resting over and in

contact with the free end 20 of the shut-out tumbler 21. This tumbler 21, which is substantially U-shape as shown in Fig. 5, comprises two members 22 and 23 joined by an end member, the said two members being in different planes, as shown. The free end 20, of the member 22, rests under the cam 19 of lever 17, and when the upper bolt 6 is retracted as shown in Fig. 3, the whole tumbler will rock rearwardly thus carrying the free ends of its members 22 and 23 nearer the rear plate of the casing for a purpose which will be hereinafter explained. This tumbler 21 is pivoted at 24 to the rear flange of the casing 1, and the free ends of its members 22 and 23 and yieldingly forced toward the cover plate 2 of the lock by a spring 25 encircling a pin 26 secured to the casing. The other, or lower end of lever 17 extends downwardly and terminates in rear of dead bolt 27, and in advance of lug 28 projecting from the rear face of the shank of said bolt. The lower bolt is not operable from the inner side of the door, but may be actuated by any and all keys of the pin tumbler lock 29, from the outer side of the door, hence it will be seen that when bolt 27 is projected as shown in Fig. 3, the lug 28 on said bolt will obstruct any movement of the lever 17, and thus prevent the upper bolt 6 from being shifted to its locking position.

Pivotally secured to the rear face of bolt 27, is the bolt dead locking tumbler 30, shown detached in Fig. 8. This tumbler is provided with a shoulder 31, which, when the bolt is in one position as shown in Fig. 1, rests against one side of the stud 32, secured to casing 1, and holds the bolt retracted, and when in its other position rests against the opposite side of said stud and holds the bolt projected. The stud 32 is secured to or integral with the lock casing, and the shoulder on the tumbler 30 is moved out of contact therewith through the link 33, pivoted at its upper end to the lever 12, and at its lower end to the tumbler 30, and also moved by the tumbler 34 carried by the bolt 27, the latter tumbler having an integral stud 35 which rests within the elongated slot 36 in the said tumbler 30, so that when the free end of said tumbler 34 is depressed by the cam 37 of the pin tumbler lock 29, the tumbler 30 will be released from said stud 32, thus leaving the bolt 27 free to be projected by the proper key. When the lever 12 is actuated by the thumb turn at the inner side of the door, the dead locking tumbler 30 is simply rocked, without of course imparting any movement to the bolt 27.

The tumbler 34 is pivotally mounted on a pin 38 carried by bolt 27, with its free end 39, which is enlarged as shown in Fig. 7. resting within the talon of bolt 27, so that when the plug of the pin tumbler lock is turned, the cam 37 on said plug first engages the free end of tumbler 34 and depresses the same. This downward movement of the tumbler moves the shoulder 31 on dead locking tumbler 30, out of the path of stud 32, thus permitting the continued movement of the cam 37 of the pin tumbler lock 29, to shift the bolt 27 to its projected or locking position.

The bolts 6 and 27 are provided each on its rear face with a lug engaged by a spring actuated lever 42 which tends to hold the bolts in their retracted positions.

With the construction thus far described, it will be seen that the bolt 27 may be projected by any key that will properly set the tumblers of the pin tumbler lock. To prevent the main bolt from being actuated by the guest and other minor keys, when the door has been locked from the outside by the key herein referred to as the shut-out key, and also to prevent the upper or inside bolt from being actuated from the outside by any key other than a special key, herein referred to as an emergency key, I provide the tumbler 34 with stops 40 and 41 which coact with the tumbler 21 previously referred to.

When both bolts 6 and 27 are in their retracted position the cam 19 on lever 17, will have pushed the tumbler 21 inwardly to a plane where the free end of the member 23 of tumbler 21, will be intermediate the two stops 40 and 41 on tumbler 34, thus leaving said tumbler 34 free to be moved by any key of the series, and the bolt 27 free to be projected by any of said keys. When the upper bolt 6 is projected, the turning movement of lever 17, turns the cam 19 upwardly, thus permitting the tumbler 21 to rock outwardly toward the cover plate, and it is so moved by the spring 25, until the member 23 of said tumbler rests in the path of movement of the stop 40 on tumbler 34. This locks the latter tumbler against movement by all keys except one constructed to move the tumbler 21 to a position to release tumbler 34. The guest's key, sub-master and master keys and other minor keys will not, but the key herein referred to as emergency key will, as hereinafter explained remove the tumbler 21 to a position between the stops 40 and 41 of the tumbler 34 and permit the bolt 27 to be projected.

The plug 43 of the pin tumbler lock carries the longitudinally movable tumbler setter 44. This tumbler setter 44 is secured to the pins 45 which are mounted in the rear end of the plug 43 of the pin tumbler lock, and is normally held in its closed position, or against the outer face of cam 37, by the springs 46 shown in dotted lines in Fig. 9. This tumbler setter 44 is provided with an outwardly projecting stem 47 which latter rests within the key slot in the plug 43 of

the pin tumbler lock, and in a position to be engaged by a bitting on the emergency and shut-out keys 47 and 48. This bitting 49 is gaged from the shoulder of the key the same as the vertical bittings provided for operating the pin tumbler mechanism, and is designed to engage the stem 47 of the key setter 44 and move the latter away from the cam 37 as clearly shown in Fig. 9.

With the guest and other minor keys, the back of the key is cut away sufficiently close to the shoulder so that there will be no contact between the bitting or shoulder 49 and the free end of the stem 47 of the key setter 44. On the emergency key, the bitting 49 is removed from the free end a distance sufficient to carry the free end of member 23 of the tumbler between stops 40 and 41 of tumbler 34, when said free end is in the plane of stop 40, as it is when the inside bolt 6 is projected as hereinbefore explained, and on the shut-out key the bitting is still closer to the free end of the key so that it will force the free end of member 23 of the tumbler to a plane beyond or to the rear of the stop 41 on tumbler 34.

If for instance the upper or inside bolt 6 be in its projected position, and it is desired to get into the room, if the emergency key be introduced into the pin tumbler lock, its bitting 49 will first force the tumbler setter 44 rearwardly, and the latter in its rearward movement will carry tumbler member 23 from the plane of stop 40 to a position intermediate the stops 40 and 41. This frees the tumbler 34 and permits the latter to be depressed by the cam 37 on the pin tumbler lock as the latter is rotated. This movement of the tumbler 34 actuates the dead locking tumbler 30 to release the same from stud 31, and a continued rotation of the cam 37 causes the latter to engage the talon of the bolt 27 and shift the latter to its projected position. As the dead locking tumbler 30 is actuated to release bolt 27, link 33 connecting said tumbler with dead locking tumbler 12, of bolt 6, actuates tumbler 12 to release bolt 6, and as bolt 27 moves to its locking position, lug 28 thereon engaging the lower end of lever 17, turns the latter in a direction to retract bolt 6. By now reversing the direction of rotation of the emergency key 47 bolt 27 will be retracted.

In order to lock the door from the outside against all other keys, the shut out key 48 is used. This key has a bitting so gaged that the member 23 of the tumbler 22 will be moved to the rear of stop 41 on tumbler 34, and as the bolt is projected by the key, the shouldered stud 50 on the bolt 27 moves over lip 51 on tumbler member 23, and prevents the latter from moving forwardly beyond the plane of stop 41 on the bolt on withdrawal of shut out key, thus deadlocking the tumbler 34 against movement by any key but the shut-out key. With this construction the outside bolt may be thrown to locking position by any one of the keys, and be retracted by the key that projected it. It may also be projected by any of the keys except the shut out key, and be retracted by the emergency key, and may be projected by the emergency key and be retracted by any of the minor keys. When however the bolt is projected by the shut-out key it is obsolutely deadlocked against all other keys of the series. Again with this construction the inside bolt if projected may be retracted by the emergency key but not by any of the minor keys. The function of the shut-out key is principally to lock the room from the outside against any and all keys, so that access may not be had to the room except by the special key which is always retained at the office.

Normally, the member 23 of the emergency and shut out tumbler 21 rests in a plane between the two stops 40 and 41 on the tumbler 34, and therefore need not be moved in order to project or retract the outside bolt, hence in all of the minor keys the bitting should be so far removed from the free end of the key as not to engage the slide 44. When however the inside bolt is projected, the movement of the lever 17 shifts the tumbler 21 to a dead locking position, hence in order to actuate the outside bolt, this tumbler must be again shifted to a position to permit tumbler 34 on the outer bolt to be actuated, and this can only be accomplished by the employment of a special key having a bitting that will impart the necessary movement to the slide 44. A still further movement is imparted to the tumbler 21 by the shut-out key, so that when the door has been locked by the latter no key of the series including the emergency key can project the slide 44 sufficiently far to actuate the emergency or shut-out tumbler.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described, but,

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is:—

1. In a lock, the combination of a bolt, a tumbler for same, a pin tumbler lock and a tumbler setter carried by said pin tumbler lock and actuated by a bitting on a key for moving said tumbler to a position to permit of the release of the bolt when the key is turned.

2. In a lock, the combination of a bolt, a

tumbler for same, a pin tumbler lock and a device carried by said pin tumbler lock and adapted to be slid rearwardly by the insertion of a key therein for moving the said tumbler to a position to permit of the release of the bolt when the key is turned.

3. In a lock, the combination of a bolt, a tumbler for same, a key lock, and a device carried by said lock and engaged by a bitting on the key, whereby when the key is inserted in the lock the said device will be forced rearwardly into contact with said tumbler and move same to a position to permit of the release of the bolt when the key is turned.

4. In a lock, the combination of a bolt, a tumbler for same, a pin tumbler lock and a device mounted to slide longitudinally in the key slot of said pin tumbler lock and engage a bitting on the key whereby when a key is inserted in said pin tumbler lock the said device will be forced rearwardly and directly engage and move said tumbler.

5. In a lock, the combination of a bolt, a tumbler, a pin tumbler lock, a series of keys for the latter and a device carried by the pin tumbler lock and adapted to be actuated by a bitting on one of said keys whereby when the said key is inserted and turned to project the bolt, the said tumbler will have been moved to a position where it cannot be released and actuated by any other keys of the series.

6. In a lock, the combination with a bolt, a tumbler for the same, a pin tumbler lock, a series of keys including a shut-out key for the latter, and a device carried by the pin tumbler lock and adapted to be slid rearwardly by bitting on the shut-out key, whereby when the shut out key is inserted and turned to throw the bolt, the tumbler will be left in a position where it cannot be engaged by any of the other keys.

7. In a lock, the combination of a bolt, a tumbler carried thereby, a shut-out tumbler for dogging the movements of said first mentioned tumbler, a pin tumbler lock and means carried by the latter and adapted to be moved by the insertion of a key to directly engage the shut-out tumbler for moving the same out of the path of movement of the tumbler carried by the bolt.

8. In a lock, the combination of a bolt, a tumbler carried thereby, a pin tumbler lock the cam of which engages said tumbler for actuating it, a tumbler for dogging the movements of said first mentioned tumbler, and a slide carried by said pin tumbler lock and adapted to be pushed into contact with said dogging tumbler by the insertion of a key for moving same out of the path of movement of the tumbler carried by the bolt.

9. In a lock, the combination of a bolt, a tumbler carried thereby, a key lock having means for actuating said tumbler, a tumbler pivoted to the lock casing and adapted to dog the tumbler on the bolt, and a spring actuated sliding device carried by the key lock and adapted to be projected rearwardly therefrom by the insertion of a key, for moving the said dogging tumbler out of the path of movement of the tumbler on the bolt.

10. In a lock, the combination of a bolt, a tumbler carried thereby and provided with a series of stops, a dogging tumbler pivoted to the lock casing and adapted, under certain conditions, to rest in the path of movement of one of said stops, a key lock for actuating said bolt, and a longitudinally movable slide carried by the pin tumbler lock and adapted to be projected at the rear of the latter by the insertion of a key, for moving said dogging tumbler out of the path of said stops.

11. In a lock, the combination of a bolt having a shouldered lug, a tumbler carried by said bolt and provided with a series of stops, a dogging or shut-out tumbler pivoted to the lock casing and adapted under certain conditions to rest in the path of movement of one of said stops, a key lock for actuating the bolt, and a slide carried by the key lock and adapted to engage said shut out tumbler, whereby when the shut-out key is inserted, the shut-out tumbler will be moved past said stops and into a position to be engaged by the shouldered lug on the bolt and held in the path of one of the stops on the tumbler carried by the bolt until released by the shut-out key.

12. In a lock, the combination of a bolt, a tumbler carried by the latter, a shut out tumbler for dogging the tumbler on the bolt, a key lock and a slide carried by the latter and projected at the rear by the insertion of the shut-out key, the said slide adapted to engage the shut out tumbler and move same to a dogging position where it can not be acted upon by any other key.

13. In a lock, the combination of a bolt, a tumbler carried by the latter, a shut-out tumbler for dogging the tumbler on the bolt, a key lock, a slide carried by the latter and adapted to be projected at the rear by the insertion of a shut out key, the said slide adapted to engage the shut out tumbler and move the same to a dogging position where it cannot be acted upon by any other key, and means movable with the bolt for holding said tumbler in its dogging position.

14. In a lock, the combination of two bolts, one operable from the inner side of the door, and the other from the outer side, a tumbler carried by the outside bolt, a tumbler for dogging the tumbler on the bolt, means connecting the two bolts whereby when the outside bolt is projected the inside bolt will be retracted, and means operated by the inside bolt whereby when the latter is projected the dogging tumbler will be

moved to a position where it cannot be actuated to release the outside bolt by any of the minor keys of the series.

15. In a lock, the combination of two bolts, one operable from the inside of the door and the other from the outside, a locking lever for each, means connecting said levers whereby both levers are moved to lock and release their bolts simultaneously, means connecting the two bolts whereby when the outside bolt is projected the inside bolt will be retracted, a tumbler on the outside bolt for actuating the lever for locking the latter, a tumbler for dogging the tumbler on the bolt, and means actuated by the movement of the inside bolt for shifting the position of the dogging tumbler, whereby the latter cannot be actuated to retract the inside bolt by any of the minor keys of the series.

16. In a lock, the combination of two bolts, one operable from the inner side of the door and the other from the outer side, a dead locking device for each, a link connecting said dead locking devices whereby they move in unison, means connecting the two bolts so that when the bolt operable from the outside is projected, the other bolt, if projected will be retracted, a tumbler for dogging the outside bolt, and means on the device connecting the two bolts, whereby when the inside bolt is projected the tumbler will be moved to a position where it cannot be actuated by any of the minor keys of the series.

17. In a lock, the combination of two bolts one operable from the outer side of the door and the other from the inner side, a deadlocking device for each, a link connecting said deadlocking devices whereby they move in unison, means having connection with both bolts, the said means being constructed to permit the inside bolt to be freely actuated independently of the outside bolt, but which latter, if projected, will be retracted by the projection of the outside bolt, means for dogging the mechanism of the outside bolt, and means actuated by the device connecting the two bolts, whereby when the inside bolt is projected, the dogging tumbler for the outside bolt will be moved to a position where it cannot be actuated by any of the minor keys of the series.

18. In a lock, the combination with two bolts, one operable from the inside of the door and the other from the outside, deadlocking means for each, means connecting said dead locking means whereby they move in unison, means connecting the bolts without interfering with their independent movements, but which will retract the inside bolt if the outside bolt be projected, a tumbler for the outside bolt, and a cam on the means connecting the bolts, the said cam adapted to engage said tumbler and move it to a position where it cannot be actuated by any of the minor keys.

19. In a lock, the combination of inside and outside bolts, means connecting them whereby the outside bolt may retract the inside bolt, a dogging tumbler for the outside bolt, means actuated by the device connecting the two bolts for shifting the position of the dogging tumbler, a pin tumbler lock, and a slide carried by the latter and adapted to be actuated by the insertion of a key for shifting said dogging tumbler to a position to release the outside bolt.

20. In a lock, the combination of inside and outside bolts, a dogging tumbler for the outside bolt, means actuated by the movement of the inside bolt for shifting the position of said dogging tumbler, a pin tumbler lock having a slide projecting through the rear end of the latter, and a series of keys having bittings on their edge to engage said slide and move it more or less whereby the dogging tumbler will be correspondingly moved.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

REINHOLD SCHOELL.

Witnesses:
SCHUYLER MERRITT,
CHARLES E. VAIL.