

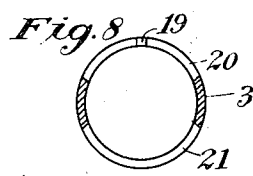
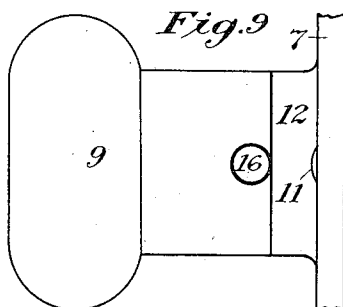
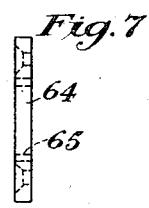
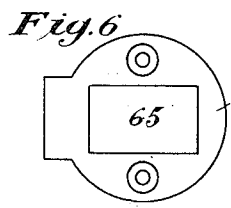
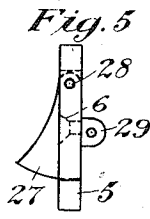
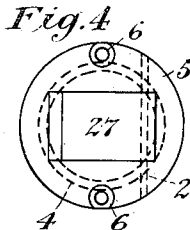
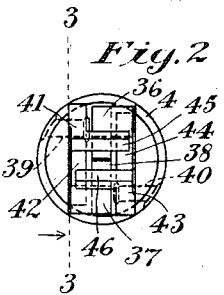
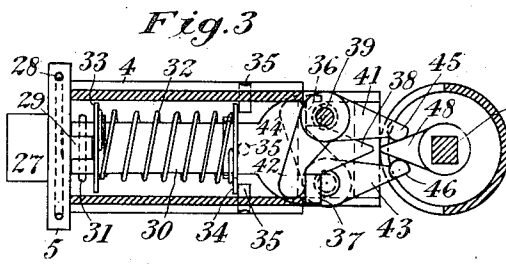
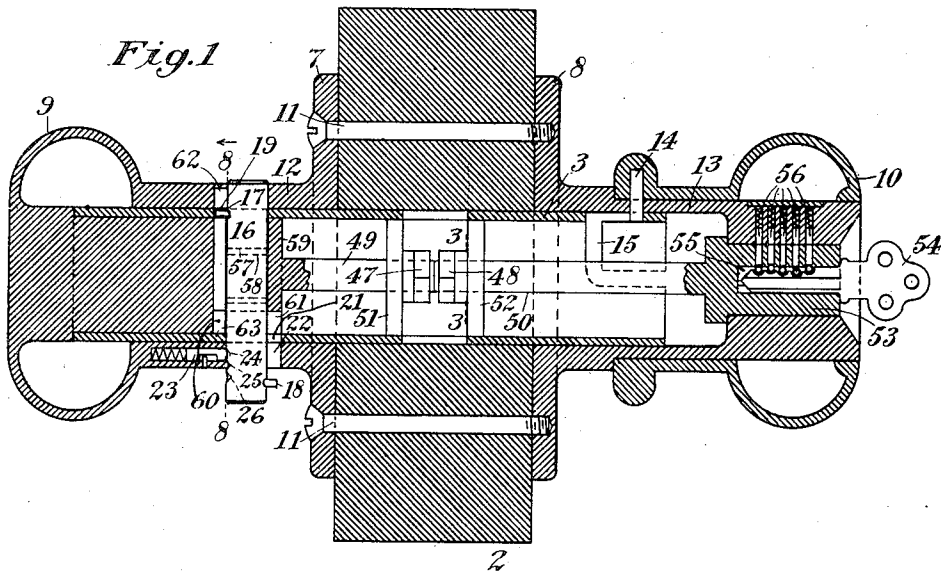
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DOOR LOCK.

APPLICATION FILED AUG. 3, 1908.

1,154,573.

Patented Sept. 21, 1915.



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UNITED STATES PATENT OFFICE.

WILLIAM F. KEMBLE AND CHARLES R. UNDERHILL, OF YONKERS, NEW YORK.

DOOR-LOCK.

1,154,573.

Specification of Letters Patent. Patented Sept. 21, 1915.

Application filed August 3, 1908. Serial No. 446,585.

To all whom it may concern:

Be it known that we, WILLIAM F. KEMBLE and CHARLES R. UNDERHILL, citizens of the United States, and residents of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Door-Locks, of which the following is a specification.

This invention relates to improvements in door-locks, and the main object of the invention is to provide a lock that can be secured to a door with the minimum of labor, expense and cutting of the door.

It is our aim to provide a lock of new type so constructed that all the main parts thereof which pass through or are located within the door will be contained in two intersecting bores in the door, one of which bores passes transversely directly through the door and the other of which passes into the edge of the door, these two bores being preferably of the same diameter and intersecting at right angles and serving when bored to permit all the parts of the lock to be carried by the door to be placed in position on or within the door, when these parts can be readily secured in place in their assembled positions.

Another important object of the invention is to provide a door-lock which will be more difficult for unauthorized persons to unlock or release than ordinary door locks, means being provided for permitting or preventing the operation of the door-latch from the inner and outer knobs of the door and for permitting operation of the latch from the inner knob only or by the key when the parts are in one relation, while in another relation of the parts it will not be possible to operate the latch either from the inner knob or from the outer knob or by means of a key.

All of the various relations of the parts that control the operation of the latch are preferably covered by a single controlling element adapted to be brought into different relations with the knobs and other parts of the lock for the purpose of changing the relations or connections between the knobs and the door-latch, and also, when desired, blocking the operation of the devices ordinarily released by the action of the key.

These and other features of our invention will be hereinafter described and claimed and are illustrated in the accompanying drawings, in which,

Figure 1 is a substantially central transverse section of our door-latch applied to a door, certain of the parts being removed; Fig. 2 is an end elevation of those parts of the lock not shown in Fig. 1 which are applied to the door; Fig. 3 is a sectional elevation, taken partly in line 3—3, Fig. 2, looking in the direction of the arrow, and partly in line 3—3, Fig. 1, looking in the direction of the arrow, of the two sets of parts carried by the door; Fig. 4 is an end elevation of the parts shown in Fig. 3, looking from the left in said figure; Fig. 5 is an edge elevation of the pivoted latch and its carrier shown in Fig. 4; Figs. 6 and 7 are details illustrating in side and edge elevation the keeper-plate adapted to be attached to the door-casing; Fig. 8 is a transverse section taken in line 8—8, Fig. 1, of a sleeve between the inner and outer door-knobs for connecting and disconnecting the same, and Fig. 9 is a plan showing the inner door-knob and the main controlling element associated with said knob and its escutcheon.

Similar characters designate like parts in all the figures of the drawings.

2 designates a door, which will be generally of wood and of any suitable type, to which our lock is applied. This door will preferably have but two main openings therein each of which may be bored by an auger of suitable size, said openings being preferably cylindrical, of the same diameter, and defined by two cylindrical elements of the lock. One of these elements is a long tubular casing 3 which extends through the transverse opening in a door and projects a considerable distance at opposite sides of the door, and the other of which is a somewhat shorter tubular casing 4, preferably of the same diameter, adapted to pass into an opening (not shown) intersecting the transverse opening in the door, and extending edgewise into the same. It will be understood that these two bores will be located at the proper distances from the side and inner edges of the door to receive the tubular parts 3 and 4 and permit the proper coaction of the operating parts of the lock. By referring to Fig. 3 it will be seen that these two tubular casing members are not only circular and of the same diameter but that they are placed at right angles to each other and that the lock tube 3 is at a predetermined distance from the inner edge of the door, while the shorter tube should be centered in

an opening extending from the inner edge of the door to and intersecting the transverse bore for the tube 3.

The shorter tube 4 has at its outer end a plate or flange 5, preferably circular and adapted to fit into a concentric opening in the edge of a door of the same diameter and depth as the plate 5, so that said plate will lie flush with the edge of the door. This plate and the tube 4 may be held in place and located by suitable means, such as screws 6, which prevent turning of the tube. The tube 3 will preferably pass through suitable escutcheons, such as 7 and 8, and into position to cooperate with inner and outer door-knobs, such as 9 and 10. The two escutcheons may be held together by long screws, such as 11, which preferably extend from the inner escutcheon but do not pass through the outer one.

In the construction shown the inner door-knob is mounted on the outside of the inner end of the sleeve 3 and abuts against the cheek of a circular boss 12 extending from the center of the inner escutcheon 7. The outer escutcheon 8 is shown as having a long substantially tubular central projection 13 constituting a lock-casing for the lock proper, and on this tubular extension the outer door-knob 13 is mounted to turn. At its outer end the sleeve 3 is connected to the outer knob in some suitable manner, as for example, by a pin 14 extending through the hub or extension 13 and into the closed longitudinal portion of a bayonet-slot 15 open at the extreme outer end of the sleeve 3. The object of this bayonet-slot connection is to permit the pin 14 to enter the open end of the slot in the assembling of the parts, after which the sleeve 3 is pushed outward, then turned part way around, and drawn in again until the pin is at the closed end of the slot, when the parts will be in the positions shown in Fig. 1. This provides an invisible and closed connection between the outer knob and the sleeve 3 without the use of screws or other adjustable securing devices.

At its inner end connection is preferably made between the sleeve 3 and the inner knob by means of an element which not only connects these parts without the use of screws, etc., but also constitutes a controlling device for governing all the relations of the two knobs and the key to the door-latch. In the embodiment of our invention herein illustrated this combined connecting and controlling element is a push-pin 16 having a pair of pins 17 and 18 projecting from opposite sides thereof near opposite ends of the pin. The pin 17 is intended to engage in or be disengaged from a longitudinal notch 19 in one of a pair of transverse slots 20 and 21 extending peripherally part way around and entirely through the sleeve 3 at the

point where it cooperates with the inner end of the inner door-knob. The pin 18 cooperates with and is intended to be locked to the walls of a radial notch or slot 22 at the bottom of the boss or hub 12 extending from the inner escutcheon 7. When the pin 17 is in the notch 19, as shown in Fig. 1, the inner and outer knobs are connected by the sleeve 3 for rotation in unison. When the pin 16 is pushed up into position for the locking-pin 18 to enter the notch 22 the push-pin 16 and the inner knob 9 will be locked to the escutcheon 7 so that they can not be turned. A third position is also provided for, in which neither the pin 17 nor the pin 18 is in action, this third position being controlled in the present case by a spring-pressed detent 23 adapted to enter the third of a series of three notches 24, 25 and 26, in one side of the push-pin 16, and hold said push-pin in any position in which it may be set. When this detent 23 is engaged in the central notch 25 the sleeve 3 and the inner knob are disconnected and the inner knob is also free from the escutcheon. In this position both the inner knob and the outer knob are free to turn and the former to retract the latch-bolt.

The three relations or connections between the two knobs that have just been described are utilized by us in the construction illustrated for controlling in three different ways the operation of the door-latch. When the pin 17 is in the notch 19, as shown in Fig. 1, with the door-knobs connected to the sleeve 3, both knobs will preferably be in operative relation with the door-latching means and operable for releasing the latch to open the door. When the detent 23 is in the middle notch 25 the parts will be so connected in the construction shown as to permit the release of the latch by the inner knob, while the outer knob will turn idly and will not be operable for opening the door. When the pin 23 is in notch 26 and pin 18 is consequently in the notch 22 the connections in the construction illustrated will be such that neither knob can be turned, nor can the latch of the lock be released even by the use of the proper key for the lock. The means which we prefer to employ between the knobs and the door-latch for accomplishing these results will now be described. Only a single door-latch is illustrated in this case, this being preferably a pivoted latch 27, the pivot being at one edge thereof and shown herein as a pin 28. Near its center said latch has a lug 29 by means of which connection is made to the main latch-operating member, which in this case is a slide 30 hinged by a pin 31 to the lug 29. A coiled spring 32 confined between a pair of washers 33 and 34 serves to normally keep the latch in position to latch the door. Suitable stops, such as pins 35 passing radially

through the walls of the sleeve 4, serve to limit the inward movement of the washer 34 surrounding the slide 30. At its extreme inner end this slide 30 is enlarged to fill substantially the internal diameter of the tube 4 and be properly guided therein. Said slide is formed in this case from a flat strip of metal having a pair of transverse projections, such as 36 and 37, struck up therefrom and turned in opposite directions, as shown in Figs. 2 and 3, while the central portion of the slide 30 at the extreme inner end thereof is preferably formed as a wedge 38 constituting a blocking device for preventing release of the latch under certain conditions. Within the inner end of the tube 4 are pivoted a pair of tumblers, formed in this case as angle-levers, the pivots of which are indicated at 39 and 40. These angle-levers face in opposite directions with respect both to the vertical and the horizontal diameter of the tube 4 when said tube is in place. The two arms of one angle-lever are indicated at 41 and 42, and the two arms of the other at 43 and 44. The arms 42 and 44 are intended to engage the projections 36 and 37 for the purpose of drawing in the slide 30 and the latch 27. The arms 41 and 43 form tumblers proper and are intended to be operated by the parts controlled by the knobs and by a proper key. Each tumbler has in this case a horizontal pin formed integral therewith and adapted to be engaged by such operating means. These pins are designated by 45 and 46. The operating means shown in the drawings for moving these tumblers embody a pair of separately-operable elements, such as the rock-arms 47 and 48, the former of which is intended to be actuated by one or both of the knobs 9 and 10 when properly connected therewith, while the latter is intended to be operated only by a key inserted in the lock proper, which is here carried by the outer knob 10.

In the construction illustrated each rock-arm is secured to a shaft 49 or 50 mounted to turn in the sleeve 3, the shaft on which the rock-arm 47 is secured being indicated at 49 and that which carries the rock-arm 48 being shown at 50. At their ends the shafts 49 and 50 are shown as supported in circular disks or washers, such as 51 and 52, while at their outer ends they are connected respectively with the push-pin 16 and with the element 53 of the lock proper which with the shaft 50 and the rock-arm 48 constitutes a key-released latch controller adapted to be turned on the insertion and turning of the proper key 54 in the usual key-slot 55. The lock employed may be of any suitable type, but we prefer to use one in which the lock proper is contained in the outer knob of the door and has the usual spring-pressed pins 56 for locking the movable element 53 to the

lock-barrel 13. The rock-arm 47 and the shaft 49 constitute parts of the knob-controlled latch-actuating means, said parts being shown as connected with and operated by the push-pin 16, the organization of the knob-controlled latch-actuating parts being such, as before stated, that the push-pin may be turned by both knobs or by the inner knob only or by neither knob, accordingly as it is connected in one or another of the three ways hereinbefore described. The connection between the shaft 49 and the push-pin 16 may be made by an extension of said shaft working preferably in an oblong opening 57 in the push-pin 16 running lengthwise thereof near the center of said pin. A lug 58 corresponding substantially to the cross-section of the opening 57 but considerably shorter than said opening is illustrated as the means of connection between the shaft 49 and the opening in said pin. The slot being longer than the lug permits the pin 16 to be moved from the central position shown in Fig. 1 to either of the other two positions corresponding to the notches 24 and 26. During this movement the lug and the shaft 49 are held stationary in the direction of movement of said push-pin by the disk 59 filling the opening in the sleeve 3.

In order that the controlling element or push-pin 16 by means of which the different relations between the knobs and the door-latch are governed may be inserted in place readily and held therein in such a manner that it can not fall out, though free to shift lengthwise from any one of its three positions to any other, the main rounded opening through which the round push-pin is passed when inserted in place has two slotted extensions one at one side thereof, as shown at 60, and the other at the other side, as shown at 61-62. When the push-pin is to be assembled with the other parts it is turned half way around as compared with the position shown in Fig. 1, so that its upper projecting pin 17 may enter the slots 22-61. When the pin 17 is in the upper part of the lower slot 61 the pin 16 should then be turned half way around to the position shown in Fig. 1, when it may be pushed up to the position illustrated and the inner knob secured to the sleeve 3, and the sleeve 3 at the same time located lengthwise with respect to the escutcheon 7 and held against lengthwise movement. This push-pin 16 therefore serves not only as a controlling device for determining the connections between the knobs and the latch but also as a means for securing the inner knob to the sleeve 3, for securing the sleeve 3 against lengthwise movement, and for thereby connecting together the elements of the lock at the outside of the door and those at the inside thereof. It will be seen that

the slot 60 is closed at its upper and lower ends by the stop-walls 62 and 63, the former of which is formed in the inner knob and the latter of which is formed by a portion of the inner surface of the sleeve 3. The stop 62 limits the upward movement of the push-pin 16, at which time the detent 23 will be in the lowermost notch 26, while the stop 63 prevents falling out of the push-pin and consequent disconnection of the parts. In addition to the functions hereinbefore described it will also be clear that the push-pin 16 has the additional function of a sliding bolt. When in the uppermost position, with the lower pin 18 in the recess 22, it acts as a lock-bolt, preventing release of the door-latch by either the inner knob or the outer knob or the key, the inner knob being then locked to the escutcheon by pin 18, and the outer knob being loose and incapable of operating the rock-arm 47; while the wedge 38 is blocked by rock-arm 47, and both tumblers—and consequently rock-arm 48—are also blocked and turning thereof is prevented. For this reason it is unnecessary to provide in addition to the latch 27 a key-operated lock-bolt, as in many types of locks.

An important feature of our invention is that when the outer knob 10 is disconnected from the inner knob 9 and from the push-pin 16 when the latter is in its intermediate position, at which time the latch can be released by the inner knob, but not by the outer knob which then turns idly, the wedge 38 and the rock-arm 47 will prevent the movement of the slide 30 in a direction for releasing the latch, these parts constituting blocking devices for preventing the opening of the door should anyone outside attempt to force back the latch 27 by pressure applied directly to the point or face thereof. In such a case the end of the wedge 38 will strike the end of the rock-arm 47 and it will be impossible for the slide to move far enough to release the latch. It will also be clear that when the pin 18 is in the notch 22 the rock-arm 47 together with the inner knob 9 will be locked to the escutcheon 7, and if at such time the key 54 is inserted into the latch-controller to turn the rock-arm 48 it will be impossible for said rock-arm to turn because the complementary rock-arm 47 blocks the wedge 38 and prevents turning of the tumblers 41 and 43. The only other necessary element of a lock of this type is a simple keeper-plate, such as 64, adapted to be attached to the door casing in the usual manner, said plate having the usual opening 65 in which the latch 27 works.

What we claim is:

1. A door-lock, comprising inner and outer door knobs, door-latching means, and controlling means between said knobs and the door-latching means for permitting said

door-latching means to be operated by either of said knobs at times and for preventing the operation of said door-latching means by either of said knobs at other times, said controlling means including a single sliding element for controlling all of said relations, which element in all of its positions is adapted to be brought into operative relation with both knobs.

2. A door-lock, comprising inner and outer door-knobs, door-latching means, and controlling means between said knobs and the door-latching means for bringing either of said knobs into operative relation with said door-latching means and for putting either of said knobs out of operative relation with said means, said controlling means embodying between the knobs and the door-latching means connecting devices mounted to turn about the axis of the knobs and having no movement lengthwise of said axis.

3. A door-lock, comprising inner and outer door-knobs, door-latching means, and controlling means between said knobs and the door-latching means for bringing the inner knob only or both of said knobs into operative relation with said door-latching means and for putting both of said knobs out of operative relation with said means said controlling means including a single push-pin controlling all of said relations.

4. A door-lock, comprising inner and outer door-knobs, door-latching means, and controlling means between said knobs and the door-latching means for bringing the inner knob only or both of said knobs into operative relation with said door-latching means and for putting both of said knobs out of operative relation with said means said controlling means including a single push-pin at the inner side of the door and controlling all of said relations.

5. A door-lock, comprising inner and outer door-knobs, door-latching means, and controlling means between said knobs and the door-latching means for bringing the inner knob only or both of said knobs into operative relation with said door-latching means and for putting both of said knobs out of operative relation with said means said controlling means including a single push-pin carried by the inner knob and controlling all of said relations.

6. A door-lock, comprising inner and outer door-knobs, door-latching means, and controlling means between the inner knob and the door-latching means for putting said knob into and out of operative relation with said door-latching means, said controlling means including a single sliding element for controlling both of said relations.

7. A door-lock, comprising inner and outer door-knobs, door-latching means, controlling means between the inner knob and the door-latching means for relatively connecting it

with said door-latching means, and means for putting said knob out of operative relation with the door-latching means and securing it against turning movement said means including a single push-pin.

8. A door-lock, comprising inner and outer door-knobs, door-latching means, a fixed cylindrical lock-barrel on which the outer knob is mounted to turn, and means at the inner side of the door for putting said outer knob into operative or inoperative relation with said door-latching means.

9. A door-lock, comprising inner and outer door-knobs, door-latching means, a fixed cylindrical lock-barrel on which the outer knob is mounted to turn, and means for normally connecting said knobs in operative relation with said door-latching means.

10. A door-lock, comprising inner and outer door-knobs, door-latching means, a fixed cylindrical lock-barrel on which the outer knob is mounted to turn, and means for normally connecting said knobs in operative relation with said door-latching means and for disconnecting said outer knob from the door-latching means and permitting said knob to turn idly.

11. A door-lock, comprising a fixed cylindrical lock-barrel, an outer knob mounted to turn on said barrel, door-latching means, and a key-released latch-controller mounted in said lock-barrel, and means for putting said outer knob into operative or inoperative relation with said door-latching means.

12. A door-lock, comprising a fixed cylindrical lock-barrel, an outer knob mounted to turn on said barrel, door-latching means, and a key-released latch-controller mounted to turn in said lock-barrel, and means for putting said outer knob into operative or

inoperative relation with said door-latching means.

13. A door-lock, comprising a fixed cylindrical lock-barrel, an outer knob mounted to turn on said barrel, door-latching means, a key-released latch-controller mounted in said lock-barrel, means for putting said outer knob into operative or inoperative relation with said door-latching means, and means for preventing at times the release of the latch by a key.

14. A door-lock, comprising inner and outer door-knobs, door-latching means, and means cooperative with the inner door-knob and also extending at all times to a position in which it is adapted to be brought into operative relation with the outer door knob for preventing at times the release of the latch by a key.

15. A door-lock, comprising inner and outer door-knobs, door-latching means, and means for putting said knobs into operative or inoperative relation with said door-latching means, and for preventing at times the release of the latch by a key, said means embodying a single controlling element located at the inner side of the door and governing all of said relations and also embodying a connecting element lying at all times in a position in which it is adapted to be brought into operative relation with the outer door knob.

Signed at New York, in the county of New York, and State of New York, this 31st day of July, A. D. 1908.

WILLIAM F. KEMBLE.

CHARLES R. UNDERHILL.

Witnesses:

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R. CHAMPION.