July 2, 1935. G. JERLING 2,006,457

DOORLOCK

Filed Aug. 29, 1931 2 Sheets-Sheet 1

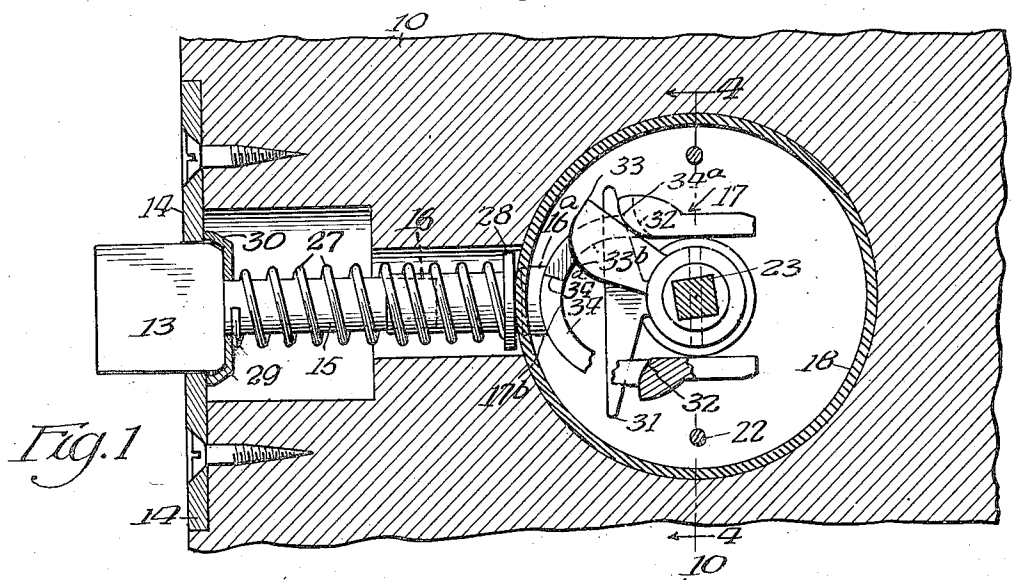

Fig. 1

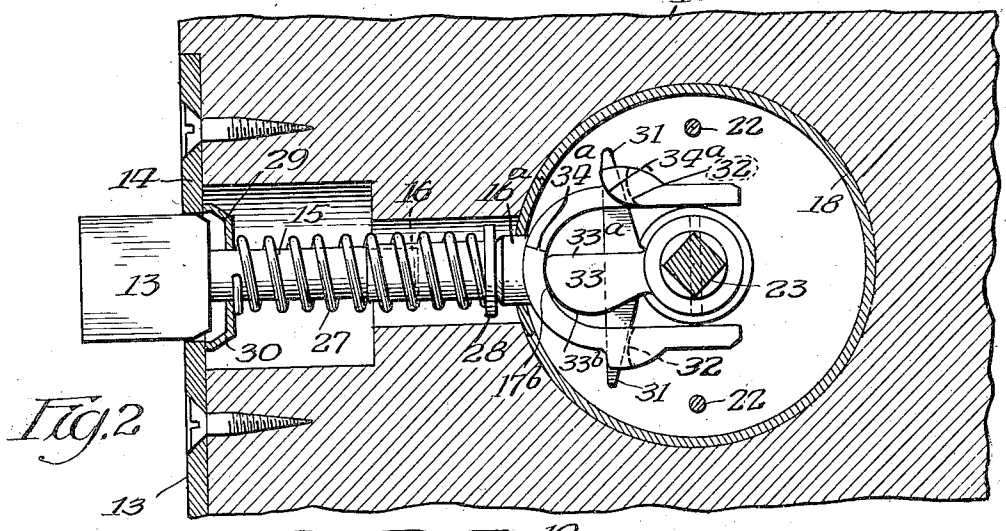

Fig. 2

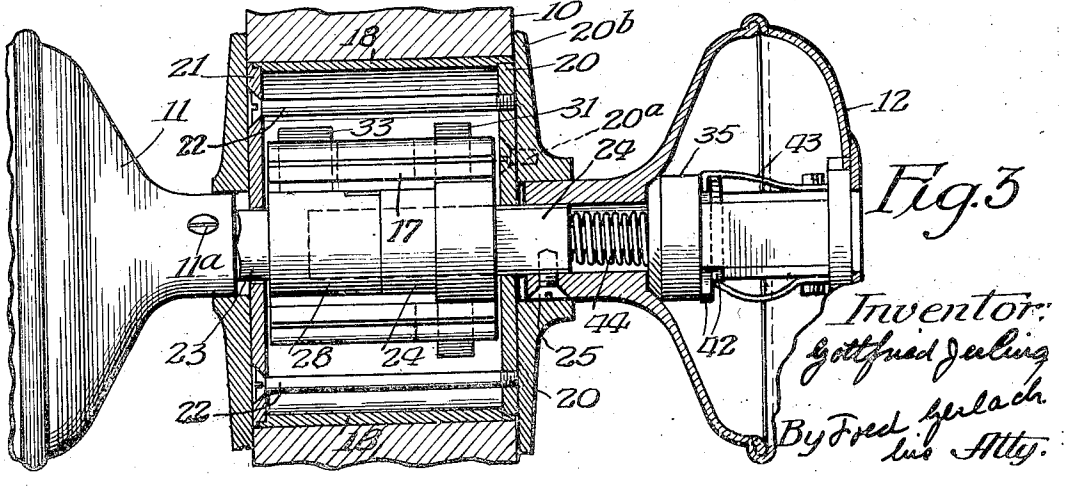

Fig. 3

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Fig. 4

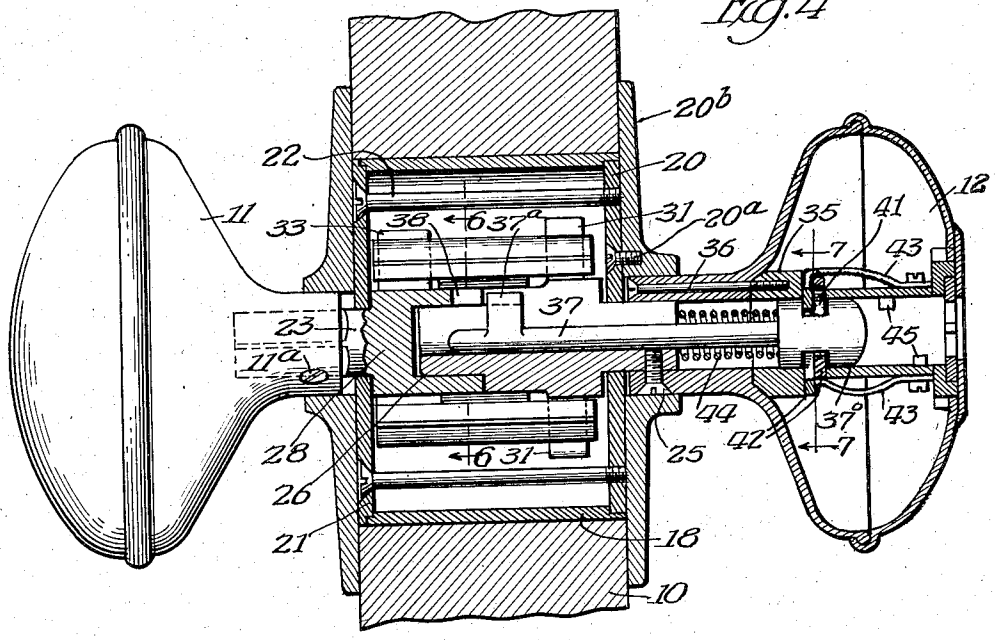


Fig. 8

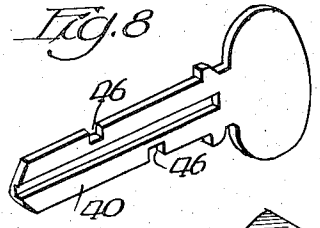


Fig. 5

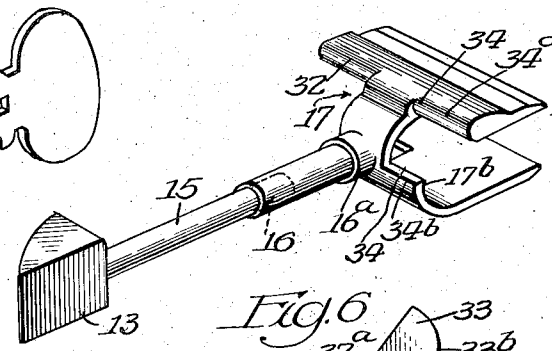


Fig. 6

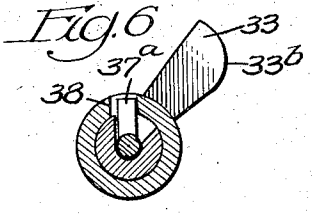


Fig. 7

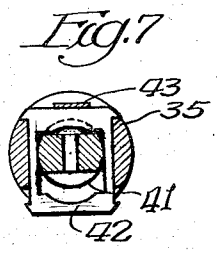


Fig. 9

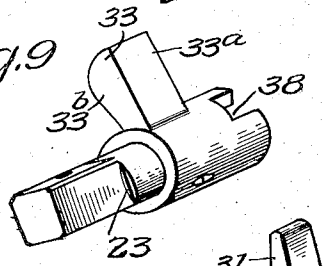


Fig. 10

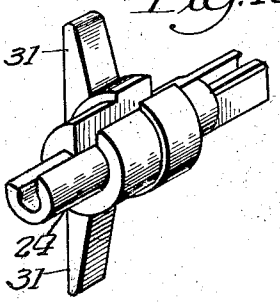
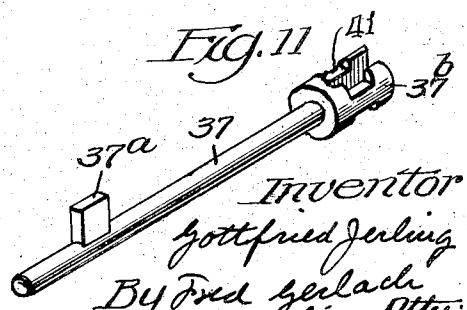


Fig. 11



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Patented July 2, 1935 2,006,457

UNITED STATES PATENT OFFICE

2,006,457

DOORLOCK

Gottfried Jerling, Chicago, Ill., assignor of one-half to Frederick E. Hummel, Chicago, Ill.

Application August 29, 1931, Serial No. 560,083

2 Claims. (Cl. 70—91)

The invention relates to door-locks of the type in which the latch or locking bolt is adapted to be operated by the door knobs or handles and which can be set so the bolt cannot be unlocked by the outside handle or knob.

One object of the invention is to provide a new and improved lock of this type in which the locking bolt may be controlled by manipulation of the inside handle so it cannot be unlocked from the outside.

Another object is to provide a lock of this type in which the bolt-releasing device, controlled by the inside knob, can be operated by a key insertable in the outside knob.

Another object of the invention is to provide a lock of this character which is simple in construction and efficient in operation.

Other objects of the invention will be apparent from the description of the invention.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a section taken longitudinally of the locking bolt of a lock embodying the invention, the operating mechanism for the locking bolt being shown in position to permit the bolt to be retracted by either the inside or outside handle. Fig. 2 is a similar view, showing the bolt locked against release by the outside handle. Fig. 3 is an axial section of the lock, parts being shown in elevation. Fig. 4 is a section taken on line 4—4 of Fig. 1. Fig. 5 is a perspective of the locking bolt and the yoke connected thereto. Fig. 6 is a section on line 6—6 of Fig. 4. Fig. 7 is a section on line 7—7 of Fig. 4. Fig. 8 is a detail of the key for releasing the locking bolt. Fig. 9 is a detail of the stem for the inside handle. Fig. 10 is a detail of the stem for the outside handle. Fig. 11 is a perspective of the key-controlled rod for releasing the bolt so it can be retracted from the outside of the door.

The invention is exemplified in a lock which is applied to a door 10 and comprises a knob or handle 11 on the inside and knob or handle 12 on the outside of the door, and a slidable locking or latch-bolt 13 which is guided in a plate 14 set into the edge of the door. The bolt 13 has a stem 15 which is screw-threaded into the stem 16 of a yoke 17. The yoke 17 is operable by mechanism hereinafter described, to withdraw the bolt from the socket in the door-frame and to lock it against retraction. This yoke and the mechanism for operating it from the door handles are contained in a casing which comprises a cylindrical shell 18 which fits in a cylindrical opening extending through the door, an outside end-plate 20 and an inside end plate 21. Screws 22 secure the plates 20, 21 and the shell 18 together.

A stem 23 is journalled in end-plate 21 and secured by a screw 11a to the inside handle 11. A stem 24, coaxial with stem 23, is removably secured by a screw 25 to the outside handle 12, is journalled in plate 20, and is extended into and journalled in a socket 26 in the inner end of the stem 23 on the inside handle. These stems are independently rotatable.

Yoke 17 straddles the stems 23 and 24, and its stem 16 is slidable through the shell 18. A coil spring 27 around said stem 16 and the stem 15 of the locking bolt 13 engages a washer 28 and a plate 29 with angular ends 30 engaging the plate 14 in which the bolt 13 is slidable. This spring holds the bolt normally projected or in door-locking position, and permits the bolt to be retracted by the operating mechanism, and restores the bolt 13 to its locking position. Washer 28 is adapted to seat on the outside of shell 18 when the bolt is unlocked or operable by the handles and is adapted to be shifted away from the shell by a shoulder 16a on the yoke stem 16 to permit the yoke and bolt to be locked as hereinafter set forth.

Oppositely extending arms 31, integral or rigid with the stem 24 of the outside handle 12, are adapted to engage abutments or shoulders 32 on the yoke 17 to retract the locking bolt 13 against the force of spring 27 by rotation of the outer handle in either direction. Inward movement of the yoke due to the influence of spring 27 is arrested when the washer 28 strikes against shell 18, as shown in Fig. 1. A single arm 33 is integral or rigid with the stem 23 of the inside handle and extends through a notch or slot 34 in the side of the yoke which projects inwardly from the yoke stem. The face 33a of arm 33 is adapted, when it is rotated by the inside handle in one direction (clockwise), to engage the end 34a of notch 34 and to retract the bolt 13 against the force of spring 27. Arm 33 has a cam 33b on its lower face which is adapted to engage the edge 34b of notch 34 in the yoke to shift the yoke outwardly a slight or sufficient distance to permit the arm 33 to pass into the central portion 17b of the yoke, as shown in Fig. 2. In such position, the force of spring 27 will be applied against arm 33. This arm is then in its dead-center position, and will lock the bolt 13 and yoke 17 against retraction by the outside handle 12 and arms 31 which are rotatable thereby. There is sufficient

clearance between arms 31 and abutments 32 on the yoke, when the yoke is in its normal or unlocked position, to permit the slight inward movement of the yoke which is necessary for the arm 33 on the inside handle to swing the yoke into its locked position. When the cam face 33b pushes the yoke 17 outwardly as the arm 33 passes into the yoke, the shoulder 16a will engage the washer 28 and unseat the latter from the shell 18, so that the yoke will be pressed against the outer end of arm 33 while the arm remains in position to lock the bolt 13. When the bolt 13 is released, arm 33 will be in the position shown in Fig. 1. By turning the inside handle 11 clockwise, the face 33a of arm 33 will engage the edge 34a of the yoke and retract the bolt 13 against the force of spring 27. While the arm 33 is in the position shown in Fig. 1, the yoke 17 will be free to be operated by the arms 31 from the outside handle 12 when the latter is rotated in either direction. In consequence the bolt 13 can be retracted by the turning of the outside handle in either direction, or by turning of the inside handle in one direction. In turning the inside handle counter-clockwise, arm 33 will be shifted into the yoke as shown in Fig. 2, so the yoke will be locked against retraction by arms 31 and the outside handle, while at the same time the bolt 13 can be retracted by clockwise rotation of the inside handle. The spring 27, acting on washer 28, which engages shell 18, yieldingly holds the yoke so that the abutment 34b will intercept the arm 33 and prevent the arm from dropping into the yoke and thus locking the bolt 13. When force is applied to the inside handle, the cam face 33b will force the yoke outwardly against the force of the spring 27, so that the arm 33, when it has passed into the yoke will be frictionally held therein. At that time, washer 28 will be unseated from shell 18. This construction makes it possible to shift the bolt 13 to an abnormal position when the arm 33 is operated to lock the bolt, causes the yoke to be pressed against the arm 33 when the latter is in bolt-locking position, and yieldingly holds the yoke so the arm 33 will not drop into the yoke, unless force is applied to the inside handle for that purpose. This exemplifies a door-lock in which the locking bolt may, by manipulation of the inside handle, be secured against retraction by the outside handle, so that a separate device for this purpose can be dispensed with.

A key operable lock is mounted in the outer handle for controlling the operation of arm 33 to release the bolt 13. This lock comprises a casing 35 which is secured by screws 36 in the outside handle 12; a stem 37 slidably mounted in the stem 24 of the outer handle; and a lug or arm 37a which is rigid with the inner end of stem 37 is adapted to pass into a notch 38 in the inner end of the stem 23 of the inside handle 11 when the stem 37 is pushed inwardly. When the lug 37a has entered the notch 38, the stem 23 of the inside handle will be rotatable by the stem 37 of the outside handle, to swing the arm 33 out of its locking position in yoke 17 and to release the locking bolt 13. A head 37b on the outer end of stem 37 is slidably mounted in the casing 35. This head is bifurcated to receive a flat key 40, and has notches 41 to receive plate tumblers 42 which are carried by the casing and are normally pressed into said notches by springs 43 to lock the stem 37 against axial movement. The inner end of key 40 is tapered to spread the tumblers to clear the head 37b for axial movement. The key is adapted to enter the bifurcated part of the head 37b and to abut against the cross wall of said part so that upon inward shift thereof it will move the stem 37 to bring lug 37a into the notch 38 of the stem 23 on the inside handle and so that when the key is turned, stem 37 and lug 37a will rotate stem 23 and swing the outer end of arm 33 out of the yoke 17 and release the bolt 13 so it can be retracted by the outer handle 12 and arms 31. A coil spring 44, between stem 24 and head 37b, holds the stem 37 in, and retracts it to, its normal position where it will be locked against axial movement by the spring-pressed tumblers 42. Lugs 45, in the casing 35, are adapted to register with notches 46 in the key 40 only when the latter has been pushed to its inner position, and so that the stem 34 can be rotated only by a proper key. This exemplifies a key-controlled lock for releasing the locking bolt from the outside of the door after the locking bolt has, by the manipulation of the inside handle, been secured to prevent it from being retracted by the outside handle.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a door lock of the character described, the combination of inside and outside, rotatable handles, a stem secured to and extending inwardly from the inside handle provided at its inner end with a notch, a stem secured to and extending inwardly from the outside handle positioned in coaxial relation with respect to the stem of the inside handle; a slidable locking bolt, a yoke on the bolt, means on the stem of the outside handle for shifting the yoke to release the bolt when the outside handle is rotated in either direction, an arm on the stem of the inside handle arranged to shift the yoke for bolt-unlocking purposes when the inside handle is rotated in one direction and operable when said inside handle is rotated in the opposite direction, to lock the yoke so that the bolt cannot be released by operation of the outside handle, a key-operable lock mounted in the outside handle, and a stem-element extending longitudinally through the stem of the outside handle and mounted in said stem so that it is held against rotation relatively thereto but is slidable lengthwise thereof, said stem-element being connected to the lock so that it is slid inwardly in response to unlocking of the lock by the key and having at the inner end thereof a member arranged to be shifted into the notch upon inward shift of the element and to form an interlocking connection whereby the arm may be shifted from the outside out of locked relation with the yoke in order to release the locking bolt so that it is operable by the outside handle.

2. In a door lock of the character described, the combination of inside and outside rotatable handles, a stem connected to and extending inwardly from the inside handle and having a central, open-ended socket in its inner end and a notch leading outwardly from the socket, a stem secured to and extending inwardly from the outside handle and having a longitudinally extending, radial groove and its inner end fitting rotatably in the aforesaid socket, a slidable locking bolt, a yoke on the bolt, means on the stem

of the outside handle for shifting the yoke to release the bolt when the outside handle is rotated in either direction, an arm on the stem of the inside handle arranged to shift the yoke for bolt-unlocking purposes when the handle is rotated in one direction, and operable when said inside handle is rotated in the opposite direction to lock the yoke so that the bolt cannot be released by operation of the outside handle, a key-operable lock mounted in the outside handle, and a stem-element mounted in the groove in the stem of the outside handle for longitudinal sliding movement, connected to the lock so that it is slid inwardly in response to unlocking of the lock by the key therefor and provided at its inner end with a laterally extending lug arranged to be shifted into the notch in the inner end of the stem of the inside handle in response to unlocking of the lock and inward shift of the stem-element, and serving when in the notch to form an interlocking connection between the two handle stems whereby the aforesaid arm may be shifted from the outside of the door out of locked relation with the yoke in response to release of the locking bolt so that it is operable by the outside handle.

GOTTFRIED JERLING.