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A. J. KOPP

DOOR LATCH AND LOCK MECHANISM

Filed Aug. 24. 1925

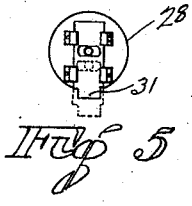


Fig 5

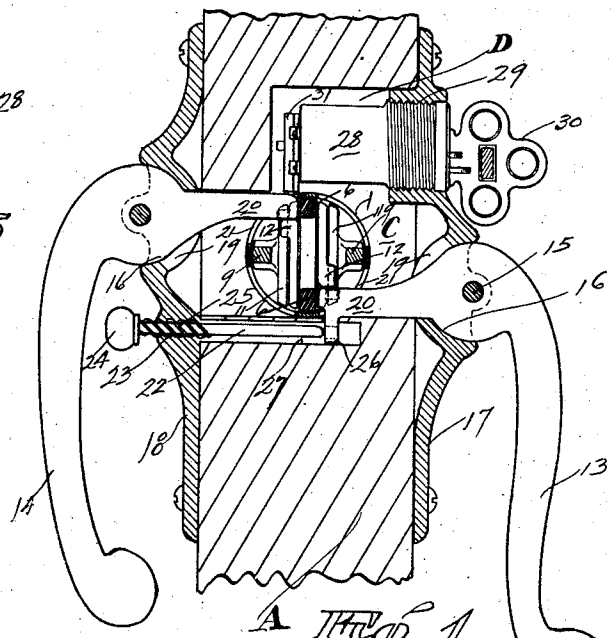


Fig 1

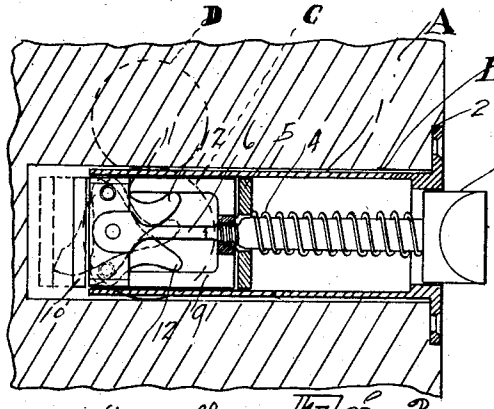


Fig 2

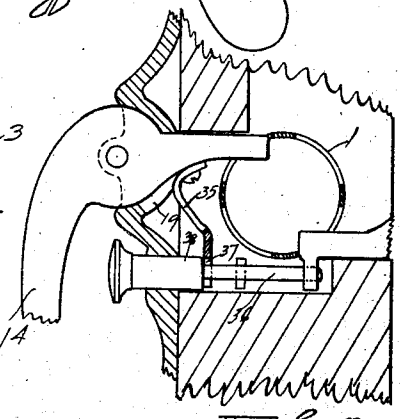


Fig 6

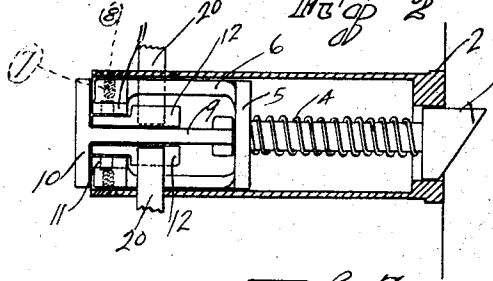


Fig 3

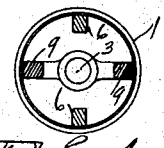


Fig 4

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UNITED STATES PATENT OFFICE.

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DOOR LATCH AND LOCK MECHANISM.

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This invention relates to an improved lock for doors and other closures, the main purpose being to provide a simple, inexpensive and easily operable lock which may be readily and cheaply installed and operated with greater ease and facility than the ordinary door lock.

An object of the invention is to provide a door lock which includes a latch mechanism having operating levers instead of the ordinary knobs, one of which levers when grasped to pull the door open, will operate the latch to withdraw the latch bolt, and the other of which levers when grasped to open the door with a pushing movement, will likewise operate the latch to withdraw the bolt, thus making for an easy and quick operation of the latch to open the door.

Another object of the invention is to provide a lock and latch mechanism of the character described which is of compact construction and arrangement and ornamental as to appearance.

A further object of the invention is to provide a novel operating mechanism for withdrawing the bolt through the operation of levers in place of door knobs and spindles, which mechanism is of simple, durable and reliable construction and is not subject to getting out of order or becoming deranged.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawing, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Referring to the drawing:

Fig. 1 represents a vertical sectional view of the lock mechanism of this invention shown as when applied to a door.

Fig. 2 represents a horizontal sectional view of the lock mechanism.

Fig. 3 represents a longitudinal sectional view of the mechanism taken at right angles to the view in Fig. 2.

Fig. 4 represents a cross sectional view taken on the line 3—3 of Fig. 3.

Fig. 5 represents an end elevation of the key actuated lock which is associated with the lock mechanism of this invention, showing the bolt arrangement of said lock.

Fig. 6 represents a fragmentary sectional view of a modified form of lock.

The embodiment of the invention shown in the accompanying drawing is applied to a door shown at A, in which is formed a socket B, opening at the edge of the door for reception of the lock barrel or casing 1. The door is also provided with a transverse opening C, opening on both sides of the door to provide for the incorporation with the lock mechanism of an operating means. The opening C is provided with an enlargement D adapted to contain another part of the lock mechanism, which enlargement opens on the outer side of the door.

The barrel or casing 1 of the lock mechanism is provided with an attaching flange 2 at its outer end, which is countersunk in the edge of the door and held with the usual fastenings. Slidably mounted within the barrel is a bolt 3 of the usual construction, having a spring 4 surrounding it and arranged to normally hold the bolt projected outwardly from the door. This bolt is slidably supported in a circular disk 5 disposed between the ends of the casing. The disk carries parallel integral arms 6 which extend towards the inner end of the casing and are provided with screw threaded openings 7 adapted to receive screws 8 inserted through the barrel, in order to hold the disk 5 in position. The inner end of the bolt 3 is screwed into one end of a rectangular frame 9 which has a working fit in the casing or barrel 1 and is provided with a circular integral head 10 adapted to have a working fit and to slide within the barrel 1. The arms 6 are provided at their outer ends with lateral extensions 11 which lie in superposed parallel relation to the inner end of the longitudinal frame 9. Pivotally mounted on the extensions 11 are dogs 12, certain ends of which are engaged with the inner face of the head 10, whereas the other ends are disposed to be engaged by operating members which will be later more fully described. These dogs rest upon the frame, being engaged with said frame and the lateral extensions. Their arrangement is such that when they are rocked, the head 10 is engaged and pushed rearward or inward, causing the frame 9 to be moved correspondingly and the bolt 3 to be withdrawn or, in other words, drawn into the

barrel so as to unlock or unlatch the door as the case may be. The above described bolt operating means is simple as to construction, compact, durable and reliable in its operation.

In the present instance the means for operating this mechanism comprises operating levers 13 and 14 mounted on opposite sides of the door. The levers are pivoted as at 15 in hemispherical depressions 16 provided in lock plates or "roses" 17 and 18 mounted on the door. These depressions are provided with openings 19 through which the inner ends 20 of the operating levers extend for cooperation with the latch mechanism within the barrel. The inner ends of the levers are extended through openings 21 provided in opposite sides of the barrel or casing 1 and engage the dogs 12 in such manner that on pushing of the lever 13 towards the door, the dog 12 engaging the inner end of said lever will be rocked and withdraw the bolt, and on pulling outward of the lever 14, the inner end thereof will engage the other dog 12 so as to likewise withdraw the bolt. Due to this arrangement, assuming that the door opens inward and the lever 13 is outside of the door, to open the door in pushing on the lever 13, the latch will be withdrawn, thus making for an easier and quicker operation of opening the door. By grasping and pulling on the lever 14, as in opening the door from inside, such movement of the lever likewise withdraws the bolt.

As a locking means there is provided a pin 22 extending through an opening 23 in the inner plate 14 and provided with a head 24 on its outer end. This pin is formed with screw threads 25 so that on turning thereof in a clockwise direction, it will be advanced into a position to extend through an apertured ear 26 depending from the portion 20 of the operating lever 13. When the pin is in this position, the lever 13 cannot be moved and the door cannot be unlatched from the outside but is subject to ordinary operation through the lever 14 on the inside. The door is provided with a groove 27 complementary to the opening C for the reception of the pin 22.

I provide a key actuated locking means which is mounted in the enlargement D of the opening C and comprises a cylindrical key actuated lock, generally designated 28, which is screwed into a screw threaded opening 29 in the upper end of the rose 17. On turning the key shown at 30, in this lock, a sliding bolt 31 provided at the rear end of the lock is moved downward and engages the upper side of the end 20 of the lever 14, depressing said end so that the dog 12 cooperating therewith will be rocked and will move the frame 9 and withdraw the bolt 3. On removal of the key 30, the lock 29 turns as is well known, and moves the bolt 31 to a position clear of the end 20 of the lever 14, said lever being so pivoted that it will gravitate into normal position. This is likewise true of the lever 13 as regards its return to normal position. Thus, it will be seen that on turning the pin 22 so that it will engage the apertured ear 26 and lock the lever 13 on the outside of the door against operation, to open the door it is necessary to insert the proper key in the lock 28 and operate said lock to cause the bolt 22 thereof to engage and operate the lever 14 so that the lock bolt 3 will be withdrawn. The combined latch and lock of this invention is much more simple as to construction, compact and less expensive than the ordinary type of door lock in general use and that due to the arrangement of the operating levers and their associated elements, the lock may be operated in a much more efficacious manner than the ordinary knob and spindle operated door lock. A further advantage is that the lock of this invention may be installed much more cheaply and easily than the ordinary lock.

In Fig. 6 the lock shown is of the same construction as the lock shown in the other figures except for an additional locking device which makes the lock as a whole particularly suited for bath room and other doors which are locked on the inside. The additional locking means comprises an angular member 35 fixed to the inner lever 14 and extending through the opening 19 downwardly towards the locking pin 36 which pin is of the sliding type instead of the screw type shown in the other form of the invention.

The member 35 has a slot 37 at its lower end in which the pin 36 is slidable and said member is adapted to engage an enlargement 38 on the pin to cause the pin to move on movement of the lever 14.

Assuming that this form of the lock is applied to a bath room door, to lock the door from the inside the pin 36 is pushed inward to lock the outside lever 13 against operation and thereby lock the door on the outside. When the door is opened from the inside the operator in pulling on the lever 14 to open the door, rocks said lever and causes the member 35 to move inward against the enlargement 38 on the pin 36, thereby moving the pin from locking position and releasing the lever 13. In this way the act of opening the door insures the unlocking of the lever 13 on the outside of the door, thus making it impossible to open the door without preparing the lock for actuation from the outside through the lever 13.

I claim:

1. A lock for doors or other closures comprising a locking bolt adapted to be mounted on the door or closure, spring means normally holding the bolt projected, levers,

means pivotally mounting the levers intermediate of their ends on a door or closure, operating means which is engaged by the inner ends of the levers which operates on rocking said levers to withdraw said bolt, said levers and operating mechanism being arranged so that on pulling one of said levers said operating mechanism is operated and on pushing the other of said levers, said operating mechanism is operated and means for locking one of said levers against operation, which means is operable from the side of the door opposite that on which the lever which it locks is mounted.

2. A lock for doors or other closures comprising a locking bolt adapted to be associated with a door, a spring normally holding said bolt extended, levers, means for pivotally mounting the levers on opposite sides of the door with the inner ends of the levers disposed adjacent to said bolt, means engaged by and operated on movement of the levers for withdrawing said bolt, which means operates on movement of either lever, said levers and operating means being arranged whereby when one lever is grasped to pull the door open, said lever is rocked and causes operation of said operating means and when the other lever is pushed to push the door open, said lever is rocked and causes operation of said operating means and means for locking against operation the lever which is to be disposed on the outside of the door, which means is subject to operation on the inside of the door.

3. A lock for doors or other closures comprising a locking bolt adapted to be mounted on the door or closure, spring means normally holding the bolt projected, levers, means pivotally mounting the levers intermediate of their ends on a door or closure, operating means which is engaged by inner ends of the levers which operates on rocking said levers to withdraw said bolt, said levers and operating mechanism being arranged so that on pulling one of said levers said operating mechanism is operated and on pushing the other of said levers, said operating mechanism is operated, means for locking against operation the lever which is to be disposed on the outside of the door, which means is operable from the inside of the door and a key actuated lock mechanism which is subject to operation from the outside of the door only and on operation of which rocks and operates the lever on the inside of the door.

4. The combination with a door, of a bolt associated with the door, spring means normally holding the bolt projected, levers, means for pivotally mounting the levers on opposite sides of the door with the inner ends of the levers disposed adjacent said bolt, operating means associated with the levers and bolt, which means operates to withdraw the bolt on rocking of either lever, said means and levers being arranged whereby the lever on one side of the door when grasped and pushed to open the door, will be rocked and cause operation of said operating means and when the other lever is grasped and pulled to open the door it will be rocked and cause operation of said operating means, means operable from the inside of the door for rocking the lever on the outside of the door, a key operated lock mounted in the door and means for operative connection between the lock and lever on the innerside of the door for locking for rocking said lever and causing the operating means to withdraw the bolt upon operation of the key actuated lock.

5. The combination with a door, of a lock barrel mounted within the door, a bolt slidable within the barrel, spring means normally projecting the bolt out of the barrel, a member to which the inner end of said bolt is attached, which member is slidably mounted within said barrel, an abutment head on said member, dogs pivotally mounted within the barrel having certain ends bearing against said abutment head and levers pivotally mounted between their ends on the door having certain ends projecting into the barrel and engaged with said dogs to cause the latter to rock on operation of the levers.

6. The combination with a door, of a lock barrel mounted within the door, a bolt slidable within the barrel, spring means normally projecting the bolt out of the barrel, a member to which the inner end of said bolt is attached, which member is slidably mounted within said barrel, an abutment head on said member, dogs pivotally mounted within the barrel having certain ends bearing against said abutment head and levers pivotally mounted between their ends on the door having certain ends projecting into the barrel and engaged with said dogs to cause the latter to rock on operation of the levers, said dogs and levers being arranged whereby pushing of one lever towards the door fixes the operation of one of the dogs and pulling of the other lever away from the door fixes the operation of the other dog.

7. The combination with a door, of a lock barrel mounted within the door, a bolt slidable within the barrel, spring means normally projecting the bolt out of the barrel, a member to which the inner end of said bolt is attached, which member is slidably mounted within said barrel, an abutment head on said member, dogs pivotally mounted within the barrel having certain ends bearing against said abutment head, levers pivotally mounted between their ends on the door having certain ends projecting into the barrel and engaged with said dogs to cause

the latter to rock on operation of the levers, a key actuated lock mounted on the door, a bolt actuated by the lock and adapted to engage and rock the lever on one side of the door and means operable on the side of the door opposite that containing the lock for rocking the lever on the outside of the door.

8. A lock for doors or other closures comprising a locking bolt adapted to be associated with a door, a spring normally holding said bolt extended, levers, means for pivotally mounting the levers on opposite sides of the door with certain ends of the levers disposed adjacent to said bolt, means engaged by and operated on movement of the levers for withdrawing said bolt, which means operates on movement of either lever, said levers and operating means being arranged whereby when one lever is grasped to pull the door open, said lever is rocked and causes operation of said operating means and when the other lever is pushed to push the door open, said lever is rocked and causes operation of said operating means, means for locking against operation the lever which is to be disposed on the outside of the door, which means is subject to operation on the inside of the door and means which incident to pulling on the lever on the inside of the door as is required in order to open the door and on consequent rocking of said lever, will automatically unlock the last named locking means and release the lever on the outside of the door.

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