

[54] **MORTISE LOCK WITH MULTIPLE FUNCTIONS**

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[52] U.S. Cl. **292/34, 70/107, 292/165, 292/336.5**
 [51] Int. Cl. **E05b 59/00**
 [58] Field of Search **70/107, 108, 109, 110, 380, 70/422; 292/34, 165, 336.5, 153**

[56] **References Cited**

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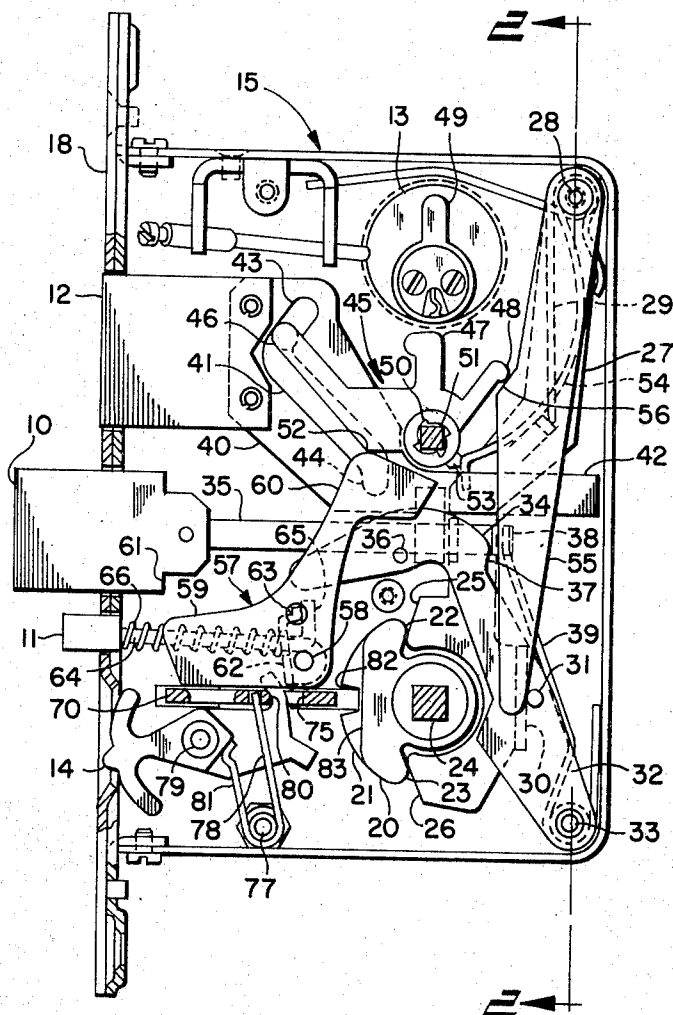
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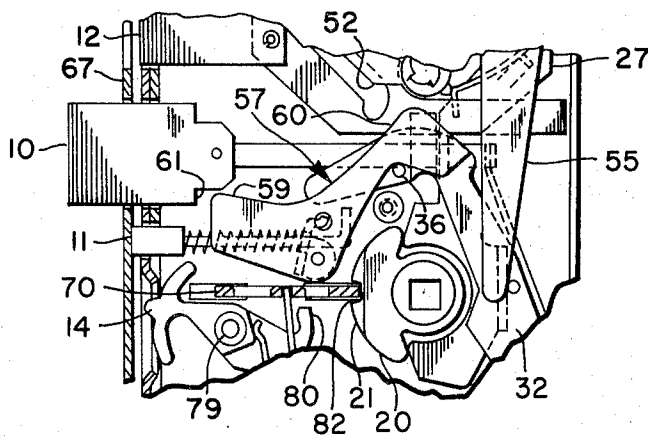
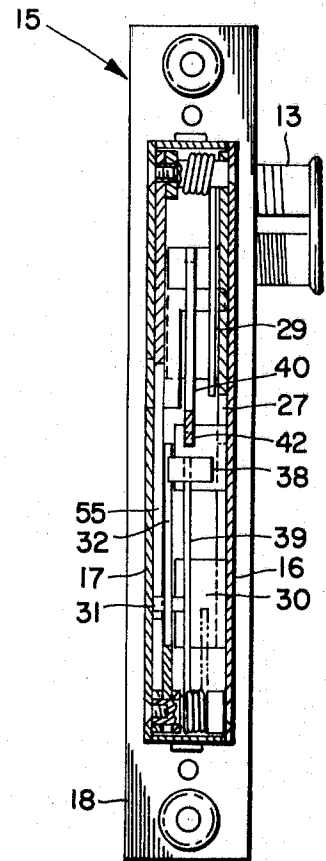
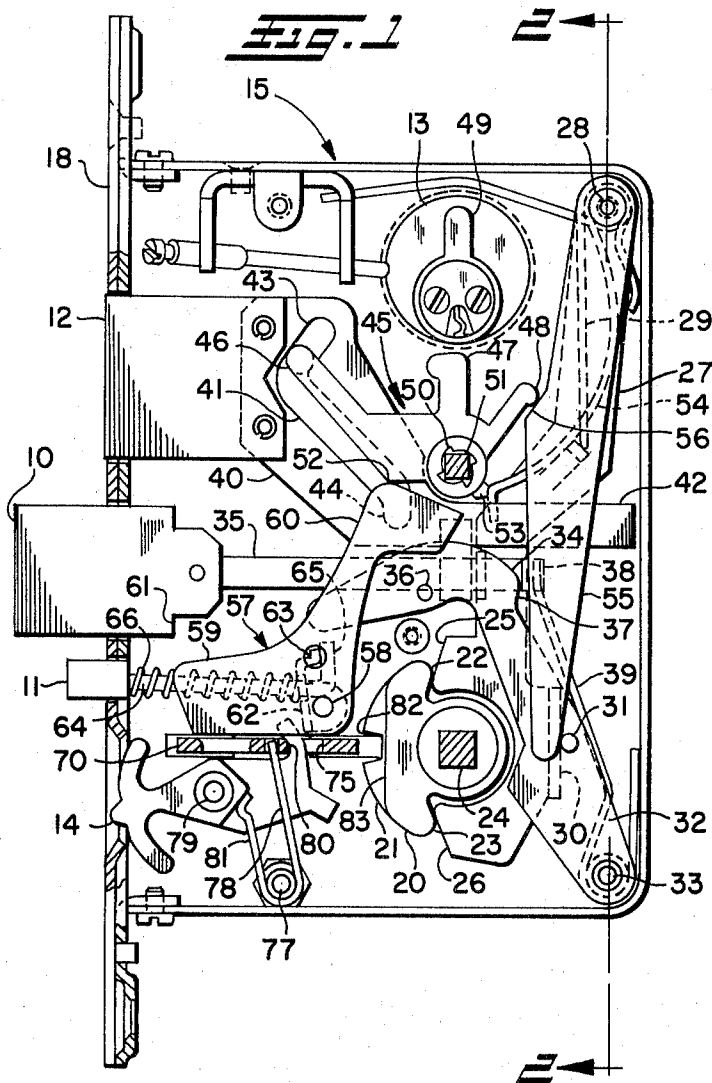
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[57] **ABSTRACT**

A deadbolt operating tumbler when rotated rearwardly beyond deadbolt retracting position will move a lever so as to operate a latchbolt retracting lever. There is a deadlatching dog coacting with both the latchbolt retracting lever and the dead-bolt tumbler. The retracting lever will move the dog to undog the latchbolt while also moving the tumbler to deadbolt retracting position. A stopwork slide is spring pressed at all times toward position locking an outside knob operated hub that moves the latchbolt retracting lever. The stopwork slide may be moved to release position by pressure of an inside hub, a lever actuated by the deadbolt tumbler, or by other parts that may be assembled. Slight reforming or reassembly of parts will permit the many lock functions that must be offered the market.

19 Claims, 15 Drawing Figures





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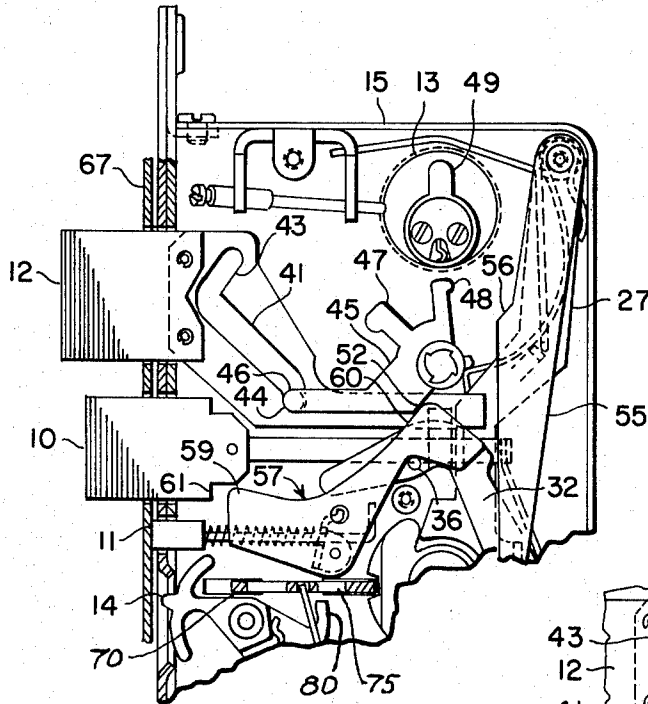


FIG. 4

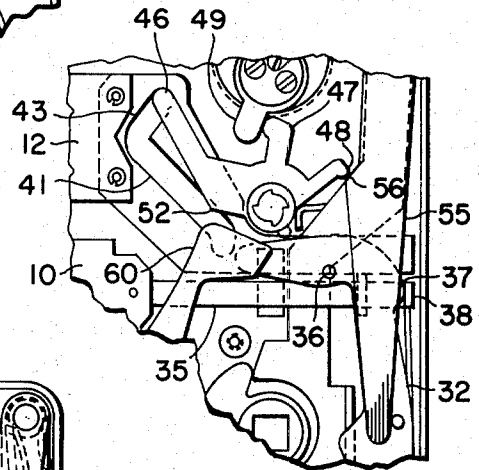


FIG. 5

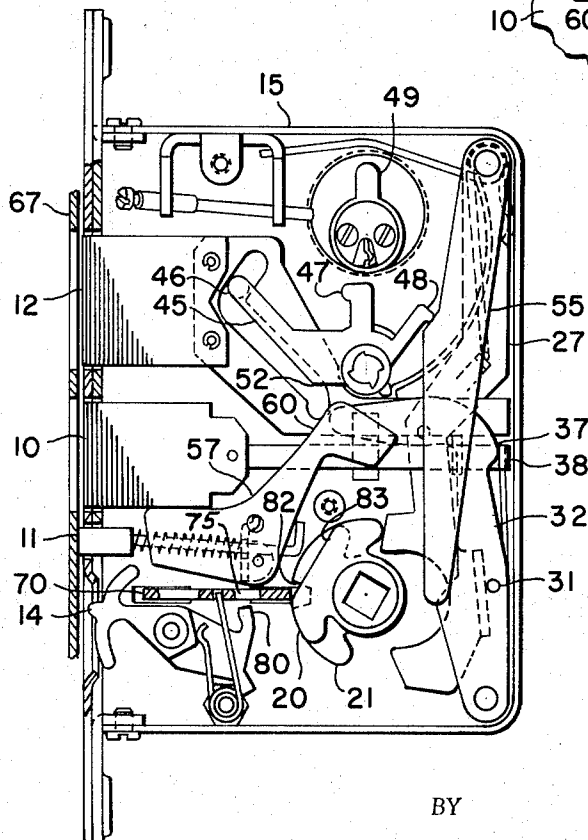


FIG. 6

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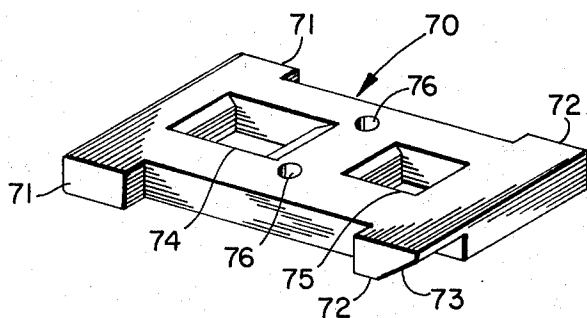


FIG. 7

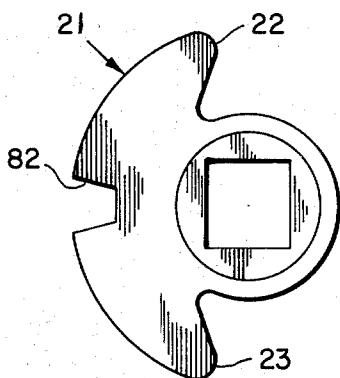


FIG. 8

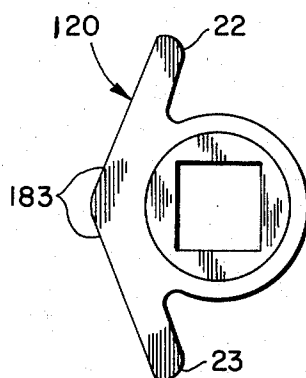


FIG. 9

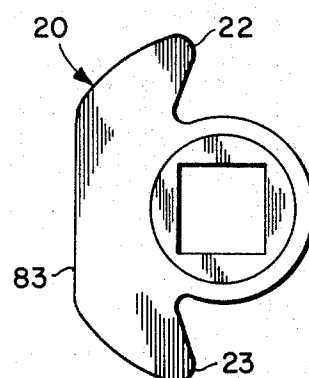


FIG. 10

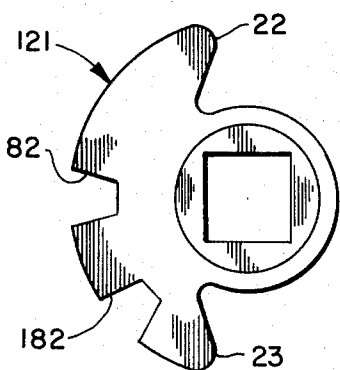


FIG. 11

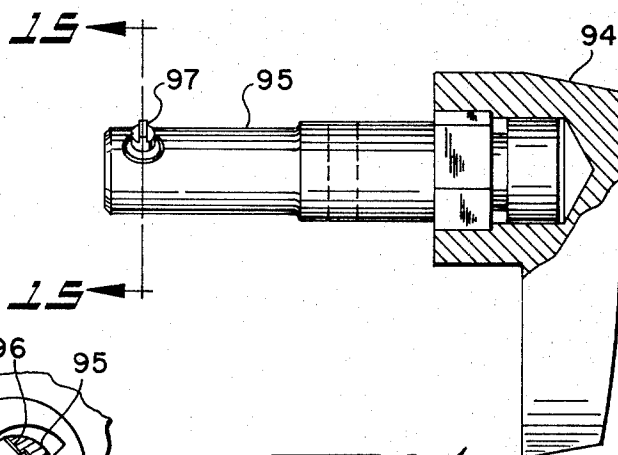


FIG. 14

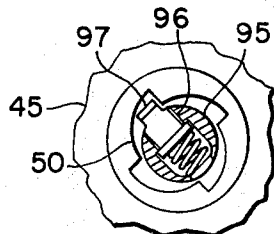


FIG. 15

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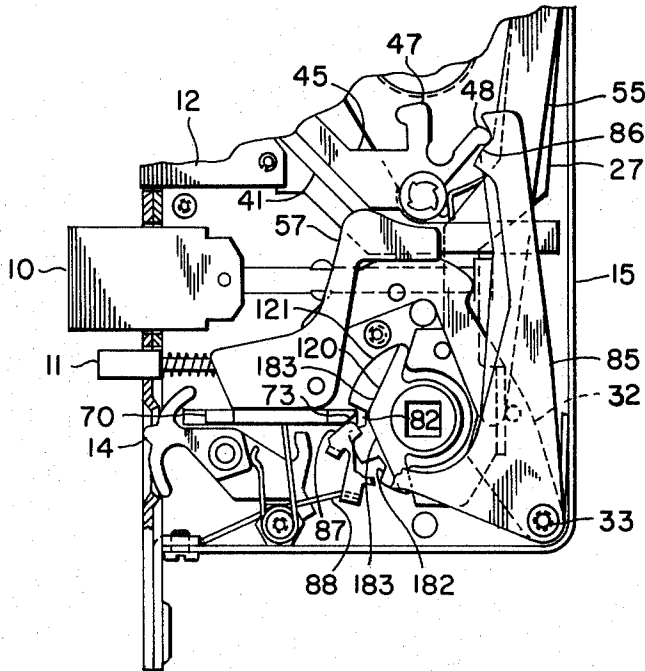


FIG. 12

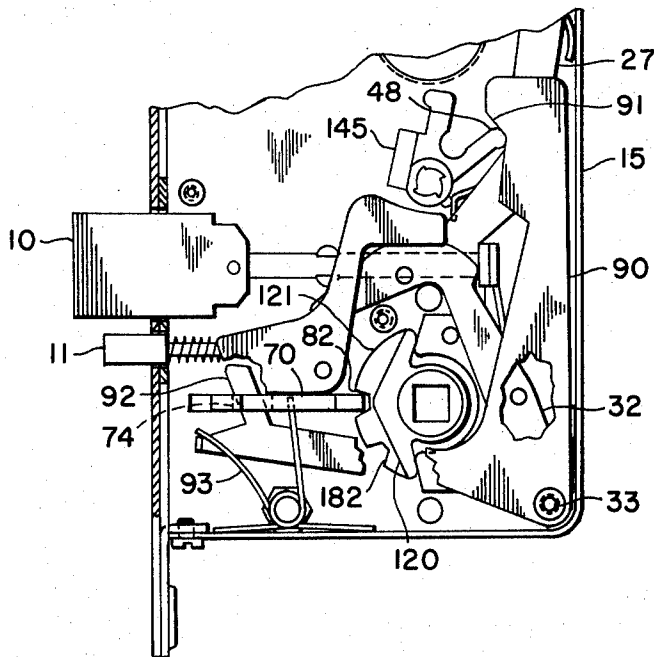


FIG. 13

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MORTISE LOCK WITH MULTIPLE FUNCTIONS

This invention relates to mortise locks, and more particularly to a novel mortise lock construction that will very effectively achieve the many operating functions that are needed in locks of the particular class.

Those skilled in the art will appreciate that mortise locks are equipped with a spring pressed latchbolt or a deadbolt, or both, and frequently there is a guard bolt for controlling deadlatching of the latchbolt. A knob will retract the latchbolt, and the deadbolt is operated by a key or thumb turn. There is a demand for mortise locks that have different operating relationships between the bolts, knobs, and other parts, and locks that differ in function are offered to the market.

Thus there must be mortise locks in which there are means for locking an outside knob, but in some locks the knob must be automatically released when an inside knob is operated, while other locks require that there be no release without manipulation of some part other than a knob. Mortise locks must be offered with and without means that will hold a latchbolt in retracted position, and with or without key retraction of a latchbolt. These and other functions must be supplied in many different combinations, and mortise locks having more than twenty different types of operation are made available commercially.

Manufacturing costs naturally are high when mortise locks are designed individually for each different type of operation, and the prior art has made efforts to standardize parts of the locks. Those efforts have found limited success, generally requiring many special parts and sometimes failing to achieve certain lock functions. I have now conceived by my invention a novel mortise lock construction that will permit the locks to be manufactured at relatively low cost, while making available the usual lock functions and further functions as well.

SUMMARY OF THE INVENTION

The concept of my invention includes a deadbolt mechanism and a latchbolt mechanism that I have designed for particular coaction one with the other, while being well adapted to be used individually in separate locks when that is required. More particularly, my deadbolt mechanism includes a bolt operating member that can actuate parts of a latchbolt mechanism when the member is moved rearwardly beyond a normal deadbolt retracting position. Also, the latchbolt mechanism may comprise a control member that can be utilized to move and to control the position of a deadbolt operating member. As a feature of this part of my invention, I am able to achieve a so-called panic function, whereby an occupant of a room need only rotate either one of a latch retracting knob or a deadbolt operating thumb turn in order to move both a latchbolt and a deadbolt to release positions.

A further feature of my invention resides in a deadlatching dog that will be effective to retract a deadbolt. More particularly, I form the dog to coact with both a latchbolt retractor and a deadbolt operating member so that the dog, when moved by the latchbolt retractor, also will retract the deadbolt. Moreover, the deadlatching dog easily can be made to dog the deadbolt in retracted position when the door is open, and by a very simple change can be used merely as a control member in a lock that is to have no deadlatching function.

Another feature of the mortise lock of my invention resides in novel stopwork for a bolt retracting hub of the lock. Thus, the stopwork includes a stop member that normally is in a locking position engaging the hub, and that enables diverse types of control to be utilized for controlling locking of the hub by the member. More in detail, a spring always presses the stop member toward locking position, and yields so that movements of the member can readily be controlled by various parts that may be assembled in the lock.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order

that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a side view of a form of my novel mortise lock, partly in section, with the lock cover removed to show the mechanism, and with parts as they would appear when the door is open;

FIG. 2 is a section on a smaller scale, taken on the line 2—2 in FIG. 1;

FIG. 3 shows a view similar to a portion of FIG. 1, but shows parts as they would appear when the door is closed and when the stopwork is in locking position;

FIG. 4 shows a view similar to FIG. 3 but with the deadbolt projected;

FIG. 5 shows a view similar to FIG. 4 but illustrates retraction of the deadbolt and latchbolt by an inside knob actuated hub;

FIG. 6 illustrates key retraction of the deadbolt and latchbolt;

FIG. 7 shows a perspective view of the stop slide on an enlarged scale;

FIG. 8 shows one form of outside hub that my lock may utilize;

FIG. 9 shows a non-camming inside hub;

FIG. 10 shows a camming inside hub;

FIG. 11 shows an outside holdback hub;

FIG. 12 is somewhat like FIG. 1 but shows parts that I may utilize when offering an exterior lock function;

FIG. 13 shows parts offering a classroom lock function;

FIG. 14 shows an inside thumb turn and spindle that I may utilize; and

FIG. 15 shows a section of the spindle on the line 15—15 in FIG. 14, together with a portion of the tumbler engaging the spindle.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now more particularly to FIG. 1 of the drawings, I show my lock equipped with types of bolts that frequently are required in mortise locks, including a latchbolt 10, a latch guard bolt 11 and a deadbolt 12. A usual lock tumbler cylinder 13 will enable the mortise lock to be operated by a key at the outside of the door, and a thumb turn (not shown in FIG. 1) may be utilized at the inside of the door. Also, at the front of the lock is a fingerpiece 14 for controlling stopwork in the lock.

I prefer to utilize a lock case 15 having features like those shown in my earlier U.S. Pat. No. 3,503,234, but details of case 15 are not important to an understanding of the present invention. It is merely necessary to know here that the case 15 has side plates 16, 17 that are shown in FIG. 2 and on which parts of the lock will be mounted, one of those plates forming a cover of the case, and a front plate 18 having openings in which the bolts slide.

Referring again to FIG. 1, I show on a lower portion of the lock case 15 a pair of inside and outside knob actuated hubs 20, 21, shown in more detail in FIGS. 8 and 10, each having upper and lower cam portions 22, 23. Those hubs 20, 21 can be rotated by inside and outside portions of a split knob spindle 24 engaging openings in the hubs, as will be understood by those skilled in the art. The cam portions 22, 23 of the hubs coact with forward surfaces 25, 26 on a hub lever 27 that I mount to pivot on a stud 28 at an extreme upper portion of

lock case 15, the lever 27 then extending past the level of the lock bolts 10, 11 and 12. A spring 29 is mounted on stud 28 and engages hub lever 27 so that its surfaces 25, 26 press against hub portions 22, 23 and tend to hold the hubs 20, 21 and their related spindle portions in a neutral position.

The hub lever 27 has a rearward surface 30 for engaging a cross pin 31 on a latch retractor lever 32 that is mounted through a stud 33 so as to pivot on a lower rear portion of lock case 15. The lever 32 extends from stud 33 in upward direction, and has an upper portion 34 juxtaposed to a bolt tail 35 that forms a part of latchbolt 10. The upper portion 34 of lever 32 is equipped with a laterally extending pin 36, to which I shall refer in due course, and is formed with a rearward cam surface 37 that lies in opposed relation to a crosspiece 38 on the latchbolt tail 35.

As is usual, latchbolt 10 is spring pressed toward a projected position, as is shown in FIG. 1, and for the purpose I utilize a spring 39 mounted on stud 33 and engaging the rear end portion of bolt tail 35. When either one of the knob actuated hubs 20, 21 rotates, that hub will move the hub lever 27 against the pressure of its spring 29 as is illustrated in FIG. 5. Hub lever 27 then acts through cross pin 31 to rotate the retractor lever 32, thereby retracting latchbolt 10. I call attention here to the fact that the hub lever 27 of my novel mechanism presents the hub engaging surfaces 25, 26 in a closely spaced relation to each other as compared to the effective length of lever 27. That enables me to retract latchbolt 10 through amounts of torque that will be very nearly equal when rotating one of the hubs 20, 21 in either direction, with no need to form a hub in an unsymmetrical shape or to utilize a sliding retractor or other torque equalizing member.

Before going farther into the operation of latchbolt 10, it will be best if we consider the deadbolt 12. Still referring to FIG. 1, I equip the deadbolt 12 with a tail 40 that is somewhat like the one shown in my earlier U.S. Pat. No. 3,503,234 that I have mentioned. Thus, deadbolt tail 40 has a portion in which there is an inclined cam slot 41, and also a portion 42 that is guided by means on the lock case 15 while the deadbolt slides between projected and retracted positions. A transverse slot 43 communicates with the forward end of the inclined cam slot 41, and in my present invention I particularly form the slot 43 to extend a considerable distance on the deadbolt tail. A further transverse slot 44 is formed at the rearward end of slot 41.

A deadbolt operating tumbler 45 is mounted to rotate on lock case 15, and is formed with a cam portion 46 that will move in the slots 41, 43 and 44. An upper portion of the tumbler 45 has arms 47, 48 formed in positions to be engaged by a key operated cam 49 that may rotate on the lock cylinder 13, enabling the tumbler 45 to be rotated by an outside key. As shown in FIG. 1, an opening 50 is formed in a hub portion of tumbler 45 and is engaged by a spindle 51, enabling the tumbler to be rotated also by an inside thumb turn. A lower part of tumbler 45 presents a cam coacting surface 52 that I shall presently describe, and tumbler 45 has a projection 53 engaged by a spring 54 that tends to hold tumbler 45 in bolt retracting and bolt projecting positions.

The key operated cam 49, when rotated clockwise from the position shown in FIG. 1, will engage the tumbler arm 47 and will rotate tumbler 45 so as to project deadbolt 12 as shown in FIG. 4. Deadbolt 12 will be retracted when the key operated cam 49 rotates from the FIG. 4 position counterclockwise so as to act against arm 48. Upon placing the deadbolt 12 in either retracted or projected position, tumbler 45 will dog the deadbolt by engagement of its cam portion 46 in slot 43 or slot 44.

I shall now describe the manner in which I relate retraction of deadbolt 12 and retraction of latchbolt 10. In FIG. 1, I show a tumbler lever 55 that is mounted on the stud 28 and that extends downwardly so as to present a portion that may act against the cross pin 31 on retractor lever 32. I form the tumbler lever 55 with a surface 56 that is juxtaposed to the arm 48 on the deadbolt operating tumbler 45 when the tumbler is in

normal bolt retracting position. It will be remembered that transverse slot 43 in the deadbolt tail extends a considerable distance. Thereby the slot 43 permits the cam portion 46 to move so that tumbler 45 can rotate rearwardly beyond its normal bolt retracting position. When so rotating, the tumbler arm 48 will act against the surface 56 as shown in FIG. 6, causing tumbler lever 55 to move retractor lever 32 so as to retract latchbolt 10.

It will be seen that a continuous rotating movement of the thumb turn spindle 51 not only will retract the deadbolt 12, should it be in projected position, but may be effective also to retract the latchbolt 10. The latchbolt may be retracted also when a key rotates the cam 49 counterclockwise against the tumbler arm 47, as in FIG. 6.

My lock, as I show it in FIG. 1, includes a control member 57 that enables me to achieve a further relation between the operations of latchbolt 10 and deadbolt 12. In addition, control member 57 may dog the latchbolt and I may term it a deadlatching dog. The control member of dog 57 is mounted through a pivot 58 on lock case 15 and is somewhat L shaped, having a forwardly extending lower part 59 that forms a dogging portion, and an upwardly extending part on which is a cam portion 60. In the open door position of the lock, shown in FIG. 1, the cam portion 60 will lie in position intermediate the cam coacting surface 52 on the deadbolt operating tumbler 45, and the pin 36 on the upper portion 34 on the retractor lever. The dogging portion 59 of dog 57 then is in a displaced relation to a shoulder 61 on the latchbolt 10. I shall indicate here that I can very easily adapt the dog or control member 57 for use in those locks where there is to be no deadlatching function, it merely being necessary to remove or omit a dogging part of portion 59.

I connect the control member or dog 57 and the guard bolt 11 through a bracket 62, shown in dotted lines in FIG. 1, that is mounted on pivot 58 and that has a lug portion 63 engaging an opening in dog 57. In effect the bracket and dog are integral. Guard bolt 11 has a tail 64 that is engaged for sliding movement in an opening in bracket 62, and that has an up-turned end portion 65 extending behind the lug portion 63 on the bracket. A coil spring 66 on the bolt tail 64 acts between guard bolt 11 and bracket 62 so as to press the guard bolt toward projected position. When guard bolt 11 is in that position, as in FIG. 1, coil spring 66 also presses the dog 57 counterclockwise due to the leverage that bracket 62 offers between the end 65 of the guard bolt tail and the rearward end of spring 66.

The operation of the control member of dog 57 will be best understood when we refer to FIG. 3. The door now is in closed position and guard bolt 11 is held depressed by its engagement with a strike 67 on the door frame, as is usual. The increased pressure of coil spring 66 now has rotated dog 57 so that its cam portion 60 has moved downwardly into juxtaposed relation to the pin 36 on retractor lever 32, while also placing its dogging portion 59 in a latchbolt dogging position behind the shoulder 61. The door being in closed position, let us assume that the deadbolt 12 has been projected, as in FIG. 4. The surface 52 on deadbolt operating tumbler 45 then overlies the cam portion 60 on dog 57. If latchbolt 10 now is retracted by knob, retractor lever 32 will rotate in a manner I already have explained, and the pin 36 on lever 32 first will act against the cam portion 60, rotating the dog 57 counterclockwise as viewed in FIG. 4. That will cause cam portion 60 to rotate tumbler 45 to deadbolt retracting position, while also causing the dogging portion 59 of the dog to move to a release position permitting full retraction of the latchbolt, as shown in FIG. 5. Incidental to full retraction, the dog 57 has moved somewhat back, or clockwise, but that is not important at this point in the operation.

It will be understood that the control member or dog 57 enables me to achieve retraction of both latchbolt and deadbolt by a single operation of a latchbolt retracting knob. Also, dog 57 enables me to offer a further feature. The door having been opened, the guard bolt 11 will be in its projected position

which is shown in FIG. 1. The guard bolt spring 66 then holds the dog 57 in position with its cam portion 60 actually blocking a movement of the cam surface 52 on tumbler 45, thus dogging the tumbler in deadbolt retracting position.

When the tumbler 45 is so dogged, the deadbolt cannot be projected. Thereby I am able to prevent the damage that frequently has been caused due to a deadbolt striking a door frame during a closing movement of a door. In some cases, it may be preferred that the cam portion 60 of dog 57 move tumbler 45 to deadbolt retracting position, but that the tumbler not be dogged in that position. In those cases I can very easily reduce a corner part of the dog portion 60 so that the tumbler surface 52 may cam that portion away from blocking position.

The stopwork of my lock comprises a stop slide 70, shown assembled in FIG. 1 and in detail in FIG. 7, that enables me to relate certain lock functions. opposed end portions of the slide 70 are formed with laterally extending parts 71, 72, FIG. 7, that will slide in openings in the side plates 16, 17 of lock case 15 so as to support the slide for movement toward and away from the knob actuated hubs 20, 21. An end portion of slide 70 has at one side an inclined surface 73. Slide 70 is further formed with longitudinally spaced openings 74, 75, and a pair of relatively small openings 76 on a medial portion of the slide.

Referring to FIG. 1, I utilize a spring that is mounted through a stud 77 on the lock case and that has an arm 78 engaging one of the openings 76 in slide 70. I particularly utilize spring arm 78 to press stop slide 70 at all times in a direction toward the hubs 20, 21. The fingerpiece 14 is mounted on a pivot 79 for rotation between dogging and undogging positions relatively to stop slide 70, being formed with an end portion 80 for engaging the opening 75 in the slide. A spring arm 81 engages fingerpiece 14 for holding it in each of its positions.

When engaging the opening 75, the end portion 80 of the fingerpiece will hold slide 70 in release relation to a slot 82 in the outside hub 21, as shown in FIG. 1. FIG. 3 shows the fingerpiece 14 in undogging position, permitting spring arm 78 to move the stop slide 70 into locking position in slot 82 so as to lock hub 21 and its knob against rotation. When moving to locking position, slide 70 places its opening 75 out of aligned relation to the end portion 80 on the fingerpiece 14, as better seen in FIG. 4, so that the fingerpiece cannot then move the slide 70 and therefore cannot effect release of the outside hub 21.

Referring to FIGS. 1 and 10, the inside knob actuated hub 20 is formed with a cam surface 83, and that surface will be effective when hub 20 is rotated, as in FIG. 5, to press the stop slide 70 to release position. The opening 75 of slide 70 then is in position to accept the end portion 80 of fingerpiece 14, and the fingerpiece again can be utilized to dog the slide in release position permitting rotation of outside hub 21.

Thus, in the construction that I show in FIG. 1, the outside hub 21 cannot be unlocked merely by an accidental or mischievous movement of the fingerpiece 14, it being necessary first to rotate the inside knob. I am able to achieve that particular hub control through my concept of a spring acting at all times to press a stop slide toward locking position, and I wish to emphasize that the concept also enables me to achieve further controls.

To explain, I can readily equip my mortise lock with a further actuating lever 85, shown in FIG. 12, whereby release of the outside knob may be independent of an operation of the inside hub. That frequently is a requirement of mortise locks, particularly when used on exterior doors. The actuating lever 85 is mounted through the pivot 33 on lock case 15, and comprises an upper arm formed with a surface 86 that engages the arm 48 on the deadbolt operating tumbler 45. A lower arm on actuating lever 85 has a cam portion 87 that will engage the inclined surface 73 on the stop slide 70. A spring 88 acts against the lever 85 in a direction pressing cam portion 87 away from surface 73. Now when the deadbolt operating tumbler 45 is rotated clockwise, either by key or by thumb turn in the manner I have already described, the tumbler arm 48 will

rotate the actuating lever 85 so that its cam portion 87 will press the stop slide 70 away from the slot 82 in the outside hub 121, shown in FIG. 12. As will be appreciated, fingerpiece 14 now can be moved to dog the stop slide 70 in release position relatively to the hub 121.

Together with the actuating lever 85 shown in FIG. 12, I utilize a non-camming inside hub 120, shown in detail in FIG. 9. That hub 120 is formed with surface 183 that will move in clearance relation to the stop slide 70 when hub 120 rotates. Thus, it will be understood that rotation of the inside knob will not move stop slide 70, and key or thumb turn operation will be necessary in order to effect release of the outside knob.

Thus far I have not described the outside hub 121 in detail because it will offer the same operation as hub 21. However, hub 121 is formed with a further slot 182, FIGS. 11 and 12, that the stop slide 70 may engage to offer a latch holdback feature as will be understood by those skilled in the art. When actuating lever 85 is assembled in my lock as shown in FIG. 12, key or thumb turn operation will be necessary in order to effect release of the latchbolt, should stop slide 70 be in position locking outside hub 121 in holdback position. In FIG. 13, I show an actuating lever 90 that is assembled in my lock when it is necessary to satisfy a requirement that a key be used to effect locking of the outside knob, as for example in classroom locks. Lever 90 is mounted through the pivot 33 on lock case 15, and comprises an upper arm on which is a surface 91 coacting with the arm 48 on a key operated tumbler 145. I may mention here that tumbler 145 may be like the deadbolt operating tumbler 45, but the tumbler need not be formed with a bolt operating portion where the lock requires no deadbolt, as for example in FIG. 13. The lever 90 further has a lower arm on which is an inclined cam portion 92 engaging the opening 74 in the stop slide 70.

A spring arm 93 engages the lower arm of lever 90 and presses the lever with sufficient strength counterclockwise so that its cam portion 92 will move stop slide 70 to release position, when that is permitted by a counterclockwise the tumbler arm 48. The inside hub utilized in FIG. 13 is the non-camming hub 120, and either of the outside hubs 21 or 121 may be used as desired.

Attention is called to the fact that the fingerpiece 14 is not present in FIG. 13. Thus, locking and release of the outside knob actuated hub 121 in FIG. 13 must be effected through rotation of the tumbler 145, acting through lever 90 to move the stop slide 70. Naturally, that always can be done by an authorized person who has a key, operating a lock cylinder at the outside of the door as I have described earlier. Also, a person who has no key can neither lock nor release the outside knob.

FIG. 13 shows no deadbolt since a deadbolt frequently is not needed when offering the so-called classroom function. Sometimes it is necessary to offer a classroom lock that does have a deadbolt and I then utilize in the assembly of FIG. 13 the deadbolt 12 and the deadbolt operating tumbler 45 that are shown in FIG. 1. Then, in novel combination with the tumbler 45, I assemble a thumb turn 94 having a particular spindle 95, shown in FIGS. 14 and 15. The inner surface of the hub opening 50 on the deadbolt operating tumbler 45 has a ratchet formation, clearly shown in FIG. 15, and thumb turn spindle 95 has a cylindrical surface that will not key relatively to opening 50. Further, spindle 95 has a radial bore 96 in which a pin 97 is spring pressed outwardly. By ratchet engagement of pin 97 with the tumbler opening 50, as shown in FIG. 15, the thumb turn 94 can rotate the tumbler 45 to retract the deadbolt, but cannot rotate the tumbler in bolt projecting direction. Thereby a person in a room such as a classroom cannot utilize the deadbolt to exclude persons who wish to enter, but always can retract the deadbolt should that be necessary in order to leave the room. While I have referred to a classroom function, it will be appreciated that the particular thumb turn operation can very readily be offered on locks having differing functions, when that is desired. In those locks where there is to be a thumb turn that will both project and

retract a deadbolt, as in FIG. 1, the thumb turn may have a spindle 51 of a standard square section, which will effectively key within the ratchet shaped opening 50 so as to rotate tumbler 45 in opposed directions.

I have shown and described several mortise lock functions merely for purposes of disclosure, and it is to be understood that the features of my lock will operate very effectively when it is necessary to construct locks having further functional requirements. For example, I may omit the deadbolt, or the stopwork, or the latchbolt and its related parts, and the remaining parts will fully satisfy their particular requirements. However, when utilizing both deadbolt and latchbolt, I am able to offer a panic function whereby retraction of either the deadbolt or latchbolt will effect the retraction of both bolts. Moreover, the stopwork of my invention is very readily adapted for control in relation to various lock functions. My invention actually enables me to offer locks having many different functions while utilizing parts that may be standard in most respects, and requiring very few special parts, thereby reducing the cost of the locks. I believe, therefore, that the very considerable value of my invention will be appreciated, and that its merits will be fully understood by those skilled in the art.

I claim:

1. In a mortise lock having a case, a deadbolt, A deadbolt operating member connected to the deadbolt and movable to forward and rearward positions placing said deadbolt in a projected relation and a fully retracted relation to the case, and latch mechanism including a knob operated latchbolt retractor for controlling and operating a spring pressed latchbolt on the case, the improvement that comprises manually operated means for moving said deadbolt operating member in rearward direction beyond its full bolt retracting position, an actuating member juxtaposed to the deadbolt operating member on the case and coacting with said latchbolt retractor, and a portion on said deadbolt operating member engaging the actuating member and moving that member whereby to actuate said latchbolt retractor when said manually operated means move the bolt operating member beyond its deadbolt retracting position, enabling the latchbolt to be retracted optionally by knob and by a movement of the deadbolt operating member.

2. The construction set forth in claim 1 comprising means through which said latchbolt retractor is in an operating relation to said deadbolt operating member when that member is in a deadbolt projecting position, said means including surfaces through which said retractor will act when knob operated to move the deadbolt operating member in deadbolt retracting direction, so that the latchbolt retractor and the deadbolt operating member will be effective each to retract both the latchbolt and the deadbolt.

3. The construction set forth in claim 2, including in combination a deadlatching dog for dogging said latchbolt in projected position, means whereby the latchbolt retractor when moving in retracting direction moves the dog to a release position relatively to the latchbolt, and said deadlatching dog comprising a portion effective when the dog is so moved by said latchbolt retractor to engage and to move the deadbolt operating member to deadbolt retracting position.

4. The construction set forth in claim 2, including in combination a knob operated hub that is effective when rotated to retract the latchbolt, a movable stop member for locking said hub, and means through which said deadbolt operating member is in operating relation to said stop member so that the deadbolt operating member when moving to retract the latchbolt may move the stop member relatively to a position locking the hub.

5. The construction set forth in claim 4, including a spring acting at all times to press said stop member toward position locking the hub, said actuating member being effective for moving the stop member to a release position against the pressure of the spring.

6. The mortise lock construction set forth in claim 1, including in combination a knob operated hub that is effective when rotated to retract the latchbolt, a movable stop member for locking said hub, and means through which said actuating member is in operating relation to said stop member so that the deadbolt operating member may move the stop member relatively to a position locking the hub.

7. The construction set forth in claim 6, including a spring acting at all times to press said stop member toward position locking the hub, said actuating member being effective for moving the stop member to a release position against pressure of the spring.

8. The construction set forth in claim 7, including a movable fingerpiece having a dogging portion for coacting with said stop member, said stop member being formed with an opening in position to accept the dogging portion of the fingerpiece when said actuating member places the stop member in release position relatively to the hub, and said spring when moving the stop member to hub locking position placing said opening out of aligned relation to the dogging portion of the fingerpiece so that said fingerpiece cannot then move to dog the stop member.

9. The mortise lock construction set forth in claim 1, in which said deadbolt is mounted for sliding on said lock case, and said deadbolt operating member is a tumbler mounted for rotation on the case, said deadbolt being formed with a slot in which a cam portion of said tumbler moves to slide said bolt between retracted and projected positions relatively to the case, a transversely extending slot communicating with the first-mentioned slot on the deadbolt for accepting said cam portion of the bolt operating tumbler when said tumbler rotates to bolt retracting position, and a portion on said tumbler engaging said actuating member and moving that member when said tumbler moves its cam portion in the transverse slot.

10. The construction set forth in claim 9, including in combination a knob operated hub that is effective when rotated to retract the latchbolt, a movable stop slide for locking said hub, and means through which said deadbolt operating tumbler is in operating relation to said stop slide so that the deadbolt operating tumbler when rotating beyond full deadbolt retracting position may move the stop member relatively to a position locking the hub.

11. The construction set forth in claim 9, including in combination a deadlatching dog for dogging said latchbolt in projected position, means whereby the latchbolt retractor when moving in retracting direction moves the dog to a release position relatively to the latchbolt, and said deadlatching dog comprising a portion extending into juxtaposed relation to said deadbolt operating tumbler, and said portion of the dog acting when the dog is moved by said latchbolt retractor to engage and to move the deadbolt operating tumbler to deadbolt retracting position.

12. In a mortise lock having a case, a deadbolt mounted for sliding on the case, a deadbolt operating tumbler mounted for rotation on the case, manually operated means for rotating said tumbler, said deadbolt being formed with a slot in which a cam portion of said tumbler moves to slide the deadbolt to projected and to fully retracted positions relatively to the case, the improvement that comprises in combination a part of said deadbolt operating tumbler in position juxtaposed to a lock actuating part when the tumbler is in deadbolt retracting position, a transversely extending slot formed in position communicating with said first-mentioned slot on the deadbolt and comprising a surface over which said cam portion of the bolt operating tumbler moves in controlling relation to the deadbolt to lock said deadbolt in retracted position when said manually operated means rotate the tumbler to a full bolt retracting position, and said transversely extending slot having a considerable length in which said cam portion will move to permit the tumbler to move said lock actuating part when the manually operated means rotate the tumbler beyond full bolt retracting position.

13. In a mortise lock having a case, a latchbolt that is spring pressed in projected position on said case, means for retracting said latchbolt, a manually operated tumbler for actuating a further part of the lock, and a deadlatching dog for dogging said latchbolt and moved by the latchbolt retracting means to a release position when those means retract the latchbolt, the improvement that comprises said deadlatching dog formed with a portion juxtaposed to said manually operated tumbler for coacting with said tumbler, and a surface on said portion of the dog for engaging the tumbler and placing said tumbler in a predetermined actuating position when said latchbolt retracting means move the dog to release position.

14. In a mortise lock having a case, a latchbolt that is spring pressed to projected position on said case, and a hub that is manually rotatable for retracting said latchbolt, the improvement that comprises a stop member movable relatively to a position engaging said hub whereby to lock said hub against rotation in said case, a spring pressing said stop member toward its locking position, a manually operable part formed with a surface for moving said stop member against its spring pressure to a release position relatively to said hub, and said surface extending in a continuous shape enabling the spring pressure of the stop member at all times to press in a direction tending to move the manually operable part and to return said stop member to locking position, so that control of said hub by said stop member may readily be related to various forms of manually operable part that may be assembled in the lock for coacting with the stop member.

15. The construction set forth in claim 14 including a fingerpiece mounted for movement to dogging and undogging positions relatively to said stop member, a portion on said fingerpiece engaging a surface on said spring pressed stop member to hold said stop member in release relation to said manually rotatable hub when the fingerpiece is in its dogging position, said portion on the fingerpiece moving away from said surface on the stop member and permitting said stop member to move by its spring pressure to locking position when the fingerpiece moves to undogging position, and parts coacting on the stop member and fingerpiece to hold the fingerpiece in undogging position while said stop member is in locking position, so that said fingerpiece will be ineffective to move said stop member to position releasing said hub.

16. In a mortise lock having a case, a deadbolt, a deadbolt operating tumbler connected to said deadbolt and rotatable in deadbolt projecting and retracting directions on the case, and a thumb turn for rotating said tumbler, the improvement that comprises pawl and ratchet means engaging between said thumb turn and said tumbler so that the thumb turn when rotating in bolt retracting direction will retract the deadbolt, and enabling the thumb turn to rotate relatively to the tumbler so that the thumb turn will be ineffective to project the deadbolt, and further means for rotating the tumbler in deadbolt projecting and retracting directions.

17. The construction set forth in claim 16 comprising in combination a spring pressed latchbolt on the lock case, a knob operated hub for retracting said latchbolt, a stop member spring pressed to a position locking said hub, an actuating member coacting with said stop member, and a portion on said deadbolt operating tumbler engaging said actuating member and moving that member so as to press said stop member to a release position relatively to said hub when said tumbler rotates in a deadbolt retracting direction.

18. The construction set forth in claim 16, in which said thumb turn is equipped with a spindle that is engaged for rotating movements in an opening in said deadbolt operating tumbler, a pawl that is spring pressed in a radial direction on said spindle, and said deadbolt operating member having a ratchet surface forming said opening and engaged by said pawl.

19. In a mortise lock having a case, a deadbolt, a deadbolt operating tumbler connected to said deadbolt and rotatable in deadbolt projecting and retracting directions on the case, and a thumbturn having a spindle engaging an opening in said tumbler for rotating said tumbler, the improvement that comprises coacting means in lost motion relation to one another on the surface of said tumbler opening and on said thumbturn spindle and permitting the thumbturn a rotating movement of substantial extent while ineffective to move the deadbolt, the coacting means on the surface of the tumbler opening adapted to accept a further thumbturn spindle that keys therewith so that said tumbler will rotate integrally with the further spindle to move said deadbolt simultaneously with each rotating movement of a thumbturn.

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