

MORTICE LOCK ASSEMBLY FOR USE WITH CYLINDER CAM IN THREE ZONES

TECHNICAL FIELD

[0001] This invention relates to a mortice lock assembly, a mortice lock assembly in combination with at least a first cylinder lock assembly and a mortice lock assembly in combination with a first cylinder lock assembly and a second cylinder lock assembly. One form of mortice lock assembly includes a latchbolt that is biased towards an extended position, with an actuator that is operable to move the bolt from the extended position to the retracted position. It will be convenient to hereinafter describe the invention with reference to this form of mortice lock assembly, however it is to be understood that the invention may also apply to a mortice lock assembly having a deadbolt.

BACKGROUND OF INVENTION

[0002] A mortice lock assembly of the foregoing kind will generally require a handle, or turn knob to operate the actuator to retract the latchbolt. A cylinder lock assembly can be added to control the operation of the actuator, and/or directly retract the latchbolt. Where the cylinder lock acts directly on the latchbolt, the handle or knob is often still provided for facilitating pulling the door from the closed position. The cylinder lock may be located to operate from an outer side of the door, and a further cylinder lock or turnsnib located to operate from the inner side of the door.

[0003] A mortice lock assembly is often the lock assembly of choice on commercial sites. This may be due to the added security required on commercial sites, which is in part provided by encasing the lock assembly housing in the mortice cavity formed in the door. While the mortice lock is generally fitted to a door by a skilled tradesman, such as a carpenter or locksmith, it still takes skilled tradesmen time to fit. Accordingly it is desirable that the design of the mortice lock assembly assist, or at least take into consideration the process of fitting the mortice lock, so as to minimise the time to fit.

[0004] The design of existing mortice lock assemblies make adjustments difficult after the lock has been fitted. The encasement of the lock housing in the mortice cavity generally obstructs the making of adjustments. The process of making adjustments requires the mortice lock to be removed from the mortice cavity, so the

adjustments can be made, and then refitted to the mortice cavity. Accordingly making adjustments after the mortice lock has been fitted can be time consuming and costly.

[0005] The process of fitting a mortice lock to a security door will often include attaching of a pair of cylinder locks to the mortice lock housing from the inner side and outer side of the door. Each cylinder lock includes a cam that may be required to interact directly with the latchbolt, or alternatively interact with a detent for controlling operation of the actuator. The latchbolt is biased towards an extended position by a spring, and therefore its position relative to the cam can be reliably assumed when fitting the cylinder lock. The position of the cam relative to detent can be more difficult to predict. The detent however may adopt an active condition or inactive condition. It is the responsibility of the tradesman fitting the lock to confirm the detent is in the correct position for interaction with the cam. This is generally an inactive condition for most mortice locks. If the position is not confirmed, the mortice lock and cylinder lock can be fitted and yet the cam may not be in a position to interact with the detent. Rectifying this problem requires at least detachment of the cylinder lock from the mortice lock, which adds to the cost of fit out. It would be desirable for the condition of the detent to be adjustable without having to detach the cylinder lock from the mortice lock assembly.

[0006] The functionality required of a mortice lock may vary from that required during the building phase to that required during the occupation phase. Initially a builder may require the mortice lock to be set to passage function so that the various trades can access the building without requiring the use of a key. As the value of the contents of the building increases throughout the build, the builder may want to adjust the function of the mortice lock to a single action escape latch. This adjusts the function of the mortice lock to one being operated from the outside by a key only, while the inside is operated by a handle only. The handle may initially only be provided on the inner side of the door, particularly where the outer side of the door may be susceptible to vandalism during the building phase. Whereas during the occupation phase the user may want a vestibule set. This provides handles on both sides with the outer handle controlled by a key, whereas the inside handle is controlled by a turnsnib. Accordingly adaptability of the interaction of the mortice lock assembly with the cylinder lock is desirable.

[0007] One issue that builders and commercial occupants face more often than domestic occupants is the vandalism of the door furniture on the outside of the door, particularly if there are no security patrols of the building site. Where the detent is used to control operation of a vandalised handle, the builder can be left without means for operating the actuator. It is therefore desirable to for the mortice lock assembly to provide the builder with options for operating the latchbolt particularly from the outer side of the door.

SUMMARY OF INVENTION

[0008] According to one aspect of this invention there is provided a mortice lock assembly for use with a first cylinder lock assembly having a first cam with a first arm and an intermediate arm, and a second cylinder lock assembly or turnsnib having a second cam with a second arm, the mortice lock assembly including a housing, a lock means within the housing that is adjustable between an active condition and an inactive condition, the lock means including a sliding member that slides relative to the housing to adjust the condition of the lock means, the sliding member including an abutment formation having a first zone, a second zone and an intermediate zone for interacting with the first arm, second arm and intermediate arm respectively, the intermediate zone being positioned between the first zone and the second zone.

[0009] It is preferred that the first zone, second zone and intermediate zone include an upper shoulder. It is further preferred that the first zone and second zone includes a lower shoulder spaced longitudinally from the first shoulder.

[0010] According to another aspect of this invention there is provided a mortice lock assembly in combination with at least a first cylinder lock assembly, the first cylinder lock assembly having a first cam with a first arm and an intermediate arm, rotation of the first cam moving the first arm moving in a first plane and the intermediate arm in an intermediate plane parallel to the first plane, the mortice lock assembly including a housing, a lock means in the housing that is adjustable between an active condition and an inactive condition, the lock means including a sliding member with an abutment formation which interacts with the first cam, the abutment formation having a first zone and an intermediate zone to interact with the first arm

and intermediate arm respectively, the intermediate zone being positioned adjacent to the first zone.

[0011] Where the mortice lock assembly includes a bolt movable relative to the housing between an extended position and a retracted position, it is preferred that the first arm configured to interact with bolt to move it from the extended position towards the retracted position on rotation of the first cam in one direction, and the first arm configured to interact with the abutment formation on rotation of the first cam in an opposite direction. It is preferred that the first arm and latchbolt are configured to prevent interaction of the first arm with the abutment on rotation of the cam in said one direction. It is further preferred that the first arm is configured so that interaction with the abutment formation causes adjustment of the lock means from the inactive condition to the active condition only. It is still further preferred that the intermediate arm is configured to interact with the abutment formation on rotation of the cam in said opposite direction so as to cause adjustment of the lock means from the active condition to the inactive condition only. The abutment formation preferably includes a first shoulder in the first zone and intermediate zone, the first shoulder having an upper surface that is engaged by the first arm and a lower surface that is engaged by the intermediate arm.

[0012] The combination may also include a second cylinder lock assembly or turnsnib including a second cam with a second arm, rotation of the second cam moving the second arm in a second plane parallel to the primary plane, the abutment formation having a second zone adjacent the intermediate zone for interacting with the second arm. It is preferred that the second zone also includes a first shoulder.

[0013] According to another aspect of this invention there is provided a mortice lock assembly in combination with a first cylinder lock assembly and a second cylinder lock assembly or turnsnib each attached to the mortice lock assembly, the first cylinder lock assembly having a first cam with a first arm and an intermediate arm, the second cylinder lock assembly or turnsnib having a second cam with a second arm, rotation of the first cam moving the first arm in a first plane and the intermediate arm in an intermediate plane parallel to the first plane, rotation of the second cam moving the second arm in a second plane parallel to the first plane, the mortice lock assembly including a housing, a lock means in the housing that is

adjustable between an active condition and an inactive condition, the lock means including a sliding member with an abutment formation which interacts with the first cam and the second cam, the abutment formation having a first zone, an intermediate zone and a second zone to interact with the first arm, intermediate arm and second arm respectively, the intermediate zone being positioned between the first zone and second zone.

[0014] Where the mortice lock assembly includes a bolt movable relative to the housing between an extended position and a retracted position, an actuator that is operable for moving the bolt from the extended position towards the retracted position, the lock means rendering the actuator inoperable when in the active condition, it is preferred that the first arm is configured to also interact with the bolt to move the bolt from the extended position to the retracted position when the first cam is rotated one direction, and the first arm interacts with the abutment formation in the first zone to adjust the detent from an inactive condition to an active condition when the first cam is rotated in an opposite direction. It is preferred that the intermediate arm interacts with the abutment formation in the intermediate zone on rotation of the cam in said one direction. It is further preferred that the abutment formation includes a first shoulder in the first zone, intermediate zone and the second zone, and a second shoulder in the first zone and second zone only. It is still further preferred that the abutment formation has a longitudinal direction and the first shoulder and second shoulder are spaced from each other in the longitudinal direction. It is still further preferred that the first shoulder is continuous across the first zone, intermediate zone and second zone. It is still further preferred that the second shoulder of the first zone is spaced from the second shoulder of the second zone.

[0015] It is preferred that the first cam is configured with the bolt to prevent the first arm from interacting with the abutment formation to adjust the lock means from the active condition to the inactive condition. Preferably the first cam is configured with the abutment formation to prevent the intermediate arm from interacting with the abutment formation to adjust the lock means from the inactive condition to the active condition.

[0016] The actuator preferably includes an inner hub and outer hub that is rotatable to move the bolt relative to the housing, and the lock means includes an

inner pawl and an outer pawl which interact with the inner hub and outer hub respectively so as to prevent rotation of the inner hub and outer hub when the lock means is in the active condition. It is further preferred that the bolt is a latchbolt including a bevelled head and a body, with latchbolt biasing means for biasing the bolt towards the extended position, whereby the head extends out of the housing when the bolt is in the extended position and the head is substantially within the housing when the bolt is in the retracted position.

[0017] The second cam is preferably configured to interact with the abutment formation only to adjust the lock means between the active condition and the inactive condition. It is further preferred that the second cam is configured to interact with the bolt to move the bolt from the extended position to the retracted position, and for adjusting the lock means from the inactive condition to the active condition only.

[0018] A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was, in Australia, known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] It will be convenient to hereinafter describe an embodiment of the invention in greater detail with reference to the attached illustrations. The drawings and the following detailed description are merely illustrative of how the invention might be put into effect. The specific form and arrangement of the various features as shown is not to be understood as limiting on the invention.

[0020] Figure 1 is an isometric partially exploded illustration of a lockset incorporating a preferred embodiment of the mortice lock assembly, according to the invention, prior to installation in a door.

[0021] Figure 2 is an isometric view of the mortice lock assembly from Figure 1 with a cover plate removed from the lock housing, and an outer cylinder lock assembly fixed to the mortice lock housing.

[0022] Figure 3 is a part sectional isometric view through III of Figure 2.

[0023] Figure 4 is a detailed isometric view of part of the mortice lock assembly from Figure 2 with the cam rotated, while the detent is in an inactive condition.

[0024] Figure 5 is a front elevation view of the mortice lock assembly from Figure 2 with the cam rotated in one direction to engage the latch bolt assembly.

[0025] Figure 6 is a front elevation view of the mortice lock assembly from Figure 5 with the cam further rotated to move the latch bolt assembly to a retracted position.

[0026] Figure 7 is a front elevation view of the mortice lock assembly from Figure 2 with the cam rotated in an opposite direction to engage a sliding member of the detent.

[0027] Figure 8 is a front elevation view of the mortice lock assembly from Figure 7 with the cam further rotated to move the sliding member to adjust the detent to an active position.

[0028] Figure 9 is a front elevation view of the mortice lock assembly from Figure 8 with the cam rotated in said one direction to engage the sliding member of the detent, whilst the detent is in an active condition.

[0029] Figure 10 is a front elevation view of the mortice lock assembly from Figure 9 with the cam further rotated to adjust the position of the sliding member, to adjust the detent to an inactive condition.

DETAILED DESCRIPTION OF THE DRAWINGS

[0030] Referring now to Figure 1 which illustrates an example of a lock set 1 which includes in summary outer door furniture 2, inner door furniture 3, a mortice lock assembly 4, an outer cylinder lock assembly 5 and an inner cylinder lock assembly 6. It will be convenient to hereinafter describe the invention with reference to the terms “inner” and “outer” for ease of explanation only. These terms may be substituted for “first” and “second” and are merely an in-use orientation. The mortice lock assembly 4 includes a housing 7 which in use is located in a mortice cavity 8 formed in a side edge of a door 9. The mortice lock housing 7 includes a front wall 10 which is attached to the side edge of the door 9, generally by screw fasteners (not shown).

[0031] The inner door furniture 3 illustrated includes an inner escutcheon 11, an inner handle 12 and an inner spindle 13. The outer door furniture 4 includes an outer escutcheon 14, an outer handle 15 and an outer spindle 16. The inner handle 12 and/or outer handle 15 may be replaced by a turn knob or the like and the invention is not intended to be limited to the inner handle 12 or outer handle 15 as illustrated. Furthermore, whilst Figure 1 illustrates the inner cylinder lock assembly 6 and the outer cylinder lock assembly 5, the inner lock assembly 6 may be substituted by an inner turnsnib. Accordingly throughout this specification a reference to an inner or second cylinder lock assembly is intended to incorporate the possibility of a turnsnib.

[0032] The cylinder lock assemblies 5, 6 illustrated in Figure 1 each include a casing 17, and a barrel 18 (only barrel 18 of inner cylinder lock assembly visible in Figure 1) that is rotatable within the casing 17 by inserting an appropriate key (not shown). The key adjusts the position of pin tumblers (not shown) in the usual manner so that they align with a sheer line (see Figure 3) formed between the barrel 18 and the casing 17. The manner in which this form of cylinder lock assembly 5, 6 functions ought to be familiar to those skilled in the art. It will be appreciated that the form of cylinder lock assembly 5, 6 illustrated may vary from that illustrated, and the invention is not to be limited to a pin tumbler cylinder lock assembly 5, 6 as hereinbefore described and illustrated. Instead, the pin tumblers may be replaced by wafers, discs or other forms of tumblers, and those other forms of cylinder lock assemblies are considered to be within the scope of the invention. Furthermore not all aspects of the invention are limited to a combination of the mortice lock assembly with both an outer cylinder lock assembly and an inner cylinder lock assembly. The invention also applies for use with the situation where the inner cylinder lock assembly may be replaced with a turnsnib (not shown) or the like. The turnsnib may have a plug (not shown) equivalent to the casing 17 and a rotatable member (not shown) equivalent to the barrel 18.

[0033] Referring now to Figure 2 which illustrates a preferred embodiment of a mortice lock assembly 4 incorporating the invention in conjunction with a preferred form of what is referred to in the claims as a first cylinder lock assembly 5. Figure 2 nominally shows the first cylinder lock assembly on the outer side of the mortice lock

assembly 4 however it may alternatively be locked on the inner side. Whilst Figure 2 illustrates what is referred to as a standard back set mortice lock assembly 4, it is to be appreciated that the invention also is applicable to short back set mortice lock assemblies and long back set mortice lock assemblies. Whilst a person skilled in the art ought to appreciate what is intended by those references, in summary, it is a reference to the distance between the front wall 10 of the housing 7 and a back wall 21 thereof.

[0034] Figure 2 illustrates a latch bolt assembly 22 having a bevelled head 23 and frame 24. The latch bolt assembly 22 is illustrated in an extended position whereby the head 23 projects out through the front wall 10 of the housing 7. A compression spring 25 acts between the latch bolt assembly 22 and an abutment 26 fixed in position relative to the housing 7 so as to bias the latch bolt assembly 22 towards the extended position as illustrated in Figure 2.

[0035] Figure 2 also illustrates an axillary bolt 27 having a wedged shaped head 28 extending out through the front wall 10 of the housing 7. The axillary bolt 27 includes a body 29 which is located within the housing 7 so as to interact with a deadlocking mechanism 30 located on the frame 24 of the latch bolt assembly 22. A compression spring 31 acts between the axillary bolt 27 and an abutment 32 formed in the mortice lock housing 7 so as to bias the axillary bolt 27 towards the extended position as illustrated. Whilst the axillary bolt 27 remains in the extended position, the deadlocking mechanism 30 is retained in an inactive condition whereby the latch bolt assembly 22 is free to move from the extended position to a retracted position (see Figure 6). However, it ought to be noted that the position of a blocking member 33 of the deadlocking mechanism 30 needs to be out of alignment with a stop 34, so as to permit the latch bolt assembly 22 to move to the retracted position as shown for example in Figure 6. The invention is not intended to be limited to the specific structure of the deadlocking mechanism 30.

[0036] The mortice lock assembly according to one preferred aspect of the invention includes an actuator 35 that is operable for moving the latch bolt 22 from the extended position to the retracted position. The actuator may take any form to achieve this function. The preferred form of actuator illustrated in Figure 2 takes the

form of an inner hub 36, and an outer hub 37 (substantially obscured). Each of the inner hub 36 and outer hub 37 include a spindle recess 38 to receive a portion of the spindle 13, 16 associated with the inner handle 12 and outer handle 15 respectively. Each of the inner hub 36 and outer hub 37 are rotatable about the spindle axis XX in order to move the latch bolt assembly 22 from the extended position as illustrated in Figure 2. Figure 2 illustrates a compression spring 39 which acts indirectly on each of the hubs 36, 37 to bias the inner hub 36 and outer hub 37 towards the orientation illustrated on Figure 2.

[0037] The mortice lock assembly 4 according to the invention also includes a lock means 40 that is adjustable between an active condition whereby the actuator 35 is rendered inoperable, and an inactive condition whereby the actuator 35 is operable. The detent may take any form to achieve this function. The preferred form of lock means 40 as illustrated in Figure 2 incorporates a sliding member 41 which slides in a direction substantially parallel to the rear wall 21, and also includes pawls 42, 43 adjacent the hubs 36, 37. The sliding member 41 includes an upper end 43 which interacts with the first cam 20, and a lower end 44 which interacts with the inner pawl 42 and outer pawl 43 acting on the inner hub 36 and outer hub 37 respectively. The specific design of the pawls illustrated is not essential in that the sliding member 40 could act directly on the inner hub 36 and outer hub 37 instead. Both of the inner pawl 42 and outer pawl 43 are biased under the influence of a compression spring 45 to adopt the non-blocking position as illustrated in Figure 2. When the condition of the lock means 40 is adjusted to an active condition, this results in the position of the pawls 42, 43 being adjusted to a blocking position as illustrated for example in Figure 8. When the inner pawl 42 or outer pawl 43 are in a blocking position, rotation of the respective inner hub 36 and outer hub 37 is prevented.

[0038] The lock means 40 according to the invention includes an abutment formation 46 for interacting with the first cam 20. The preferred form of abutment formation 46 is illustrated in Figure 2, and it should be noted that the abutment formation includes three longitudinally extending zones of interaction. For ease of explanation, the three zones of interaction may be identified as a first zone 47, second zone 48 and an intermediate zone 49. Figure 2 illustrates a preferred form of first cam 20 that is capable of interacting (associated with the outer cylinder lock assembly 5) with the second zone 48, and intermediate zones 49 respectively. The

first cam 20 illustrated in Figure 2 includes a first arm 50 and an intermediate arm 51 extending out opposed sides of the cam body 52. The manner in which the first arm 50 and intermediate arm 51 interact with the abutment formation will be described in detail with reference to later illustrations. However it should be noted that the first arm 50 is intended to interact with the abutment formation 46 in the first zone, when attached to the outer or first cylinder lock assembly 5, or the latchbolt assembly 22. Whereas the intermediate arm 51 interacts with the abutment formation 46 in the intermediate zone 49 only.

[0039] It can be appreciated from Figure 3 that the abutment formation 46 includes a first shoulder 53 which extends across the first zone 48, intermediate zone 49 and second zone 47. The abutment formation also includes a second shoulder 54 in the second zone 47 and first zone 48 only. This leaves a gap 55 between the second shoulders 54 of the second zone 47 and first zone 48 in the intermediate zone 49.

[0040] It can be appreciated from Figures 3 and 4 that the intermediate arm 51 of the first cam 20 includes a bent portion 56 so that on rotation of the first cam 20 in one direction the intermediate arm 51 moves through the gap 55 between the second shoulders 54 of the second zone 47 and first zone 48. Further rotation in the one direction of the first cam 20 from the position illustrated in Figure 4 results in the first arm 50 of the first cam 20 engaging the latch bolt assembly 22 as illustrated in Figure 5.

[0041] It can also be appreciated from Figure 5 that the intermediate arm 51 of the first cam 20 is free to rotate past the first shoulder 53 of the abutment formation 46, whilst the lock means 40 is in the inactive condition as illustrated in Figure 5. Further rotation of the first cam 20 from the position illustrated in Figure 5 results in interaction of the first arm 50 of the first cam 20 with the latch bolt assembly 22, to cause the latch bolt assembly 22 to move from the extended position illustrated in Figure 5 to the retracted position as illustrated in Figure 6. This permits, for example, the outer or first cylinder lock assembly 5 to be used to move the latch bolt assembly 22 to a retracted position to allow the door to be opened, without adjusting the condition of the lock means 40. It should be noted that the first cam 20 can be rotated back in the

opposite direction to return it to the position as illustrated in Figure 2, again without adjusting the condition of the lock means 40.

[0042] Referring now to Figure 7 which illustrates the first cam 20 rotated from the position illustrated in Figure 2 in an opposite direction to that as illustrated for example in Figure 5, so that the first arm 50 engages the first shoulder 53 of the lock means 40. Further rotation of the first cam 20 in said opposite direction results in the sliding member 41 of the lock means 40 being forced downwards to cause pivoting of the pawls 42. Figure 8 illustrates the further rotation of the first cam 20 resulting in the lock means 40 adopting the active condition whereby the hubs 36 are prevented from rotating. Again, the first cam 20 can be returned to the position as illustrated in Figure 2 whilst retaining the lock means 40 in the active condition illustrated in Figure 8.

[0043] Referring now to Figure 9 which illustrates the lock means 40 in the active condition and the first cam 20 being rotated so that the intermediate arm 51 engages the first shoulder 53 of the abutment formation 46. Further rotation of the first cam 20 from the position illustrated in Figure 9 results in the sliding member 41 being moved to a raised position as illustrated in Figure 10. This results in the lock means 40 adopting an inactive condition so that the pawls 42 disengage from the hubs 36. It will be appreciated that the first cam 20 can be rotated back to the original position as illustrated in Figure 2 whilst retaining the lock means 40 in the inactive condition as illustrated in Figure 10.

[0044] The applicant has appreciated that it is generally preferable that the cylinder first cam 20 operating from the outer cylinder lock assembly 5 include the first arm 50 and second arm 51 whereas it is preferred that the second cylinder lock assembly 6 operating from the inner side of the mortice lock assembly 4 include a second cam (not clearly shown) with a single arm only. The single arm would interact with the inner zone 47 only and shaped to locate between the first shoulder 53 and second shoulder 54, or alternatively shaped the same as the first arm 50 of the first cam 20 to interact with the latchbolt assembly 22 and the abutment formation 46. The second cam would not include an equivalent intermediate arm as this would hinder operation of the intermediate arm 51 of the first cam 20. Furthermore where the second cylinder lock assembly 6 is replaced by a turnsnib (not shown) the second cam would be attached to, or form part of, the rotatable member.

[0045] Various alterations and/or additions may be introduced to the mortice lock assembly as hereinbefore described without departing from the spirit or ambit of the invention.

[0046] Future patent applications may be filed in Australia or overseas on the basis of or claiming priority from the present application. It is to be understood that the following provisional claims are provided by way of example only, and are not intended to limit the scope of what may be claimed in any such future application. Features may be added to or omitted from the provisional claims at a later date so as to further define or re-define the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A mortice lock assembly for use with a first cylinder lock assembly having a first cam with a first arm and an intermediate arm, and a second cylinder lock assembly or turnsnib having a second cam with a second arm, the mortice lock assembly including a housing, a lock means within the housing that is adjustable between an active condition and an inactive condition, the lock means including a sliding member that slides relative to the housing to adjust the condition of the lock means, the sliding member including an abutment formation having a first zone, a second zone and an intermediate zone for interacting with the first arm, second arm and intermediate arm respectively, the intermediate zone being positioned between the first zone and the second zone.
2. A mortice lock assembly according to claim 1 wherein the first zone, second zone and intermediate zone include an upper shoulder.
3. A mortice lock assembly according to claim 2 wherein the first zone and second zone includes a lower shoulder.
4. A mortice lock assembly in combination with at least a first cylinder lock assembly, said first cylinder lock assembly having a first cam with a first arm and an intermediate arm, rotation of the first cam moves the first arm in a first plane and the intermediate arm in an intermediate plane parallel to the first plane, the mortice lock assembly including a housing, a lock means in the housing that is adjustable between an active condition and an inactive condition, the lock means including a sliding member with an abutment formation which interacts with the first cam, the abutment formation having a first zone and an intermediate zone to interact with the first arm and intermediate arm respectively, the intermediate zone being positioned adjacent to the first zone.

5. A combination according to claim 4 wherein the mortice lock assembly includes a bolt movable relative to the housing between an extended position and a retracted position, the first arm configured to interact with the bolt to move it from the extended position towards the retracted position on rotation of the first cam in one direction, and the first arm configured to interact with the abutment formation on rotation of the first cam in an opposite direction.

6. A combination according to claim 5 wherein the first arm and latchbolt are configured to prevent interaction of the first arm with the abutment on rotation of the cam in said one direction.

7. A combination according to claim 5 or 6 wherein the first arm is configured so that interaction with the abutment formation causes adjustment of the lock means from the inactive condition to the active condition only.

8. A combination according to any one of claims 5 to 7 wherein the intermediate arm is configured to interact with the abutment formation on rotation of the cam in said opposite direction so as to cause adjustment of the lock means from the active condition to the inactive condition only.

9. A combination according to any one of claims 4 to 8 wherein the abutment formation includes a first shoulder in the first zone and intermediate zone, the first shoulder having an upper surface that is engaged by the first arm and a lower surface that is engaged by the intermediate arm.

10. A combination according to any one of claims 4 to 9 including a second cylinder lock assembly or turnsnib including a second cam with a second arm, rotation of the second cam moving the second arm in a second plane parallel to the first

plane, the abutment formation having a second zone adjacent the intermediate zone for interacting with the second arm.

11. A combination according to claim 10 wherein the second zone includes a first shoulder.

12. A mortice lock assembly in combination with a first cylinder lock assembly and a second cylinder lock assembly or turnsnib each attached to the mortice lock assembly, the first cylinder lock assembly having a first cam with a first arm and an intermediate arm, the second cylinder lock assembly or turnsnib having a second cam with a second arm, rotation of the first cam moving the first arm in a first plane and the intermediate arm in an intermediate plane parallel to the first plane, rotation of the second cam moving the second arm in a second plane parallel to the first plane, the mortice lock assembly including a housing, a lock means in the housing that is adjustable between an active condition and an inactive condition, the lock means including a sliding member with an abutment formation which interacts with the first cam and the second cam, the abutment formation having a first zone, an intermediate zone and a second zone to interact with the first arm, intermediate arm and second arm respectively, the intermediate zone being positioned between the first zone and the second zone.

13. A combination according to claim 12 including a bolt movable relative to the housing between an extended position and a retracted position, an actuator that is operable for moving the bolt from the extended position towards the retracted position, the lock means rendering the actuator inoperable when in the active condition, the first arm being configured to also interact with the bolt to move the bolt from the extended position to the retracted position when the first cam is rotated one direction, and the first arm interacts with the abutment formation in the first zone to adjust the detent from an inactive condition to an active condition when the first cam

is rotated in an opposite direction.

14. A combination according to claim 13 wherein the intermediate arm interacts with the abutment formation in the intermediate zone on rotation of the cam in said one direction.

15. A combination according to any one of claims 12 to 14 wherein the abutment formation includes a first shoulder in the first zone, intermediate zone and the second zone, and a second shoulder in the first zone and second zone only.

16. A combination according to claim 15 wherein the abutment formation has a longitudinal direction and the first shoulder and second shoulder are spaced from each other in the longitudinal direction.

17. A combination according to claim 15 or 16 wherein the first shoulder is continuous across the first zone, intermediate zone and second zone.

18. A combination according to any one of claims 15 to 17 wherein the second shoulder of the first zone is spaced from the second shoulder of the second zone.

19. A combination according to any one of claims 12 to 19 wherein the first cam is configured with the bolt to prevent the first arm from interacting with the abutment formation to adjust the lock means from the active condition to the inactive condition.

20. A combination according to claim 19 wherein the first cam is configured with the abutment formation to prevent the intermediate arm from interacting with the abutment formation to adjust the lock means from the inactive condition to the active condition.

21. A combination according to any one of claims 13 to 20 wherein the actuator includes an inner hub and outer hub that is rotatable to move the bolt relative to the housing, and the lock means includes an inner pawl and an outer pawl which interact with the inner hub and outer hub respectively so as to prevent rotation of the inner hub and outer hub when the lock means is in the active condition.

22. A combination according to any one of claims 13 to 21 wherein the bolt is a latchbolt including a bevelled head and a body, with latchbolt biasing means for biasing the bolt towards the extended position, whereby the head extends out of the housing when the bolt is in the extended position and the head is substantially within the housing when the bolt is in the retracted position.

23. A combination according to any one of claims 12 to 22 wherein the second cam is configured to interact with the abutment formation only to adjust the lock means between the active condition and the inactive condition.

24. A combination according to any one of claims 13 to 22 wherein the second cam is configured to interact with the bolt to move the bolt from the extended position to the retracted position, and for adjusting the lock means from the inactive condition to the active condition only.