

A LOCK WITH AN IMPROVED SNIB MECHANISM

FIELD OF THE INVENTION

The present invention relates to locks, and in particular to locks having a snib
5 mechanism.

BACKGROUND OF THE INVENTION

It is relatively common to provide door locks which are convertible between two or more of the following modes, namely a passage mode, a safety mode and a
10 deadlocking mode. In the passage mode the lock is effectively "unlocked" such that the door can be opened from either side without the need for a key, simply by operating the handle or lever on either side of the door.

In the safety mode, the handle or lever on one side of the door (typically the inside)
15 may be operated to open the door, but the handle or lever on the other side is "locked" and cannot be used to open the door. This is often accomplished by way of a snib mechanism operable from one side of the door (again typically the inside) so that when the snib mechanism is engaged (i.e. when the lock is "snibbed"), the handle or lever on the other side of the door becomes locked. In some instances, the lock may
20 also be provided with a key barrel mechanism which is capable of overriding the snib mechanism. Therefore, in these locks it may be possible to open the door from the other side (i.e. the outside) when the lock is in the safety mode by operating the key barrel to disengage the snib mechanism. The operation of the key barrel to disengage the snib typically returns the lock to the passage mode.

25 In general, only locks having a key barrel mechanism have a deadlocking mode. In the deadlocking mode, it is not possible to open the door using the door's handles/levers. Rather, in order to open the door, a key must be inserted into the key barrel to thereby operate the key barrel mechanism to unlock the lock. In some locks
30 which have a deadlocking mode, the operation of the key barrel will unlock and "open" the lock thereby allowing the door to be opened, whereas in other locks the operation of the key barrel merely returns the lock to the passage mode and it is then necessary to operate the door's handle/lever (on one side or other) to open the door. In most known locks having a deadlocking mode, it is possible to operate the key

barrel using a key from either side of the door, although in some applications the key barrel may be operable from only one side (typically the outside).

5 Locks exist which are convertible between two of the above modes; typically the passage mode and the safety mode, or the passage mode and the deadlocking mode. There are also some locks in existence which are convertible between all three modes.

10 A problem with these existing locks is that the mechanisms for converting between the modes is often complex. In particular, the snibbing mechanism used to convert the lock from the passage mode to the safety mode can be intricate and must therefore be operated by an external lever, button or other device which is separate from the main handle or lever used to open the door. The need for a separate snib lever can create inconvenience as the presence of two separate levers/handles on the exterior of the lock can complicate the operation of the lock. The separate snib lever can also be
15 unsightly, and in some cases it can even impede the operation of the main operating handle. Therefore, it would perhaps be preferable if the snib mechanism could be operated by the same handle/lever that is used to open the door.

20 Another problem with the above-mentioned "multimode" locks is that it can be difficult or impossible to ascertain whether the lock is "unlocked" or "locked" without attempting to operate the lock. This can be inconvenient because time may be wasted while it is determined what must be done to unlock the lock. Furthermore, in extreme situations such as where a person must operate the lock quickly to flee a fire or other emergency, the time wasted in this way may create a life-threatening danger rather
25 than a mere inconvenience. Consequently, it might be useful to have a multimode lock with a means for visually indicating the current mode that the lock is in, or at least whether the lock is "unlocked" (openable) or "locked" (un-openable).

30 It will be clearly understood that any reference herein to background material or a prior publication is not to be taken as an acknowledgement or admission that any material, publication or combination thereof formed part of the common general knowledge in the field, or is otherwise admissible prior art, whether in Australia or in any other country.

OBJECTS OF THE INVENTION

It is an object of the present invention to provide a lock that may at least partially ameliorate one or more of the above-mentioned disadvantages, or which may provide a useful or commercial choice in the marketplace. Further objects will be evident
5 from the following description.

In one form the present invention resides in a lock having a lock tongue which is moveable between a latching position and a free position, a handle to move the lock tongue, a locking member that is moveable between a locking position to lock the
10 lock tongue and an unlocking position, and an actuator that is movable by the handle between a first position and a second position, characterised in that the actuator is operatively associated with the locking member so that movement of the actuator into the second position moves the locking member into the locking position.

15 In a preferred form, the present invention resides in a lock having a lock body, a lock tongue which is moveable between a latching position and a free position, a handle to move the lock tongue, a locking member which is moveable between a locking position to lock the lock tongue and an unlocking position, a hub which is movable by the handle, and an actuator in the lock body which is operatively associated with the
20 hub so that movement of the hub moves the actuator, wherein the actuator is movable between a first position and a second position and is operatively associated with the locking member so that when the actuator is in the second position the locking member is in the locking position.

25 Therefore, the lock of the present invention has an actuator that operates to move the locking member from the unlocking position where the lock tongue is "unlocked" to the locking position where the lock tongue is "locked". Also, because the actuator is operated by the operating handle (i.e. the same handle as is used to operate the lock tongue to thereby open the lock), it is possible with the present lock to move the
30 locking member from the unlocking position into the locking position (i.e. to snib the lock) without the need for a separate snib button, lever etc.

It is envisaged that the lock of the present invention will typically be used on sliding doors such as external sliding security doors and internal sliding doors. Such sliding

doors often cooperate with a strike which is fixed to the door jam or to the opposing sliding door, and the strike often has a hook shaped protruding nose which engages with the lock tongue when the door is closed. However, it will be clearly understood that no particular limitation is meant in relation to the kind of doors on which the lock may be used, and the lock may equally be used in a wide range of other applications such as swinging doors, roller doors or windows. It is also envisaged that the present lock may optionally form part of a multipoint lock assembly, and this is explained in greater detail below.

10 The lock of the present invention may have a lock body. The lock body may comprise any form of housing or casing suitable for containing and securely protecting internal mechanisms and components of the lock. The lock body may also be adapted to enable the lock to be positioned on, or inserted into, the door. For this reason the lock body may comprise mounting means to enable the lock to be securely
15 fastened on or in the door. Any suitable mounting means may be used, including lips, ribs, holes, channels, brackets and the like, and these may facilitate attachment to the door via fasteners such as screws, bolts, rivets, snap fits or adhesives.

The lock body may comprise, among other things, a casing, covers and an end plate
20 configurable so as to securely house the internal workings of the lock within the body. Components such as the covers and the end plate may also be provided with formed tabs and the like which may, possibly in combination with the body's other mounting means, add to the strength of the body. Preferably, at least some components such as the covers and the end plate may be connectable to other parts of the body using clip-
25 on or snap fit type arrangements. In addition to assisting with ease of assembly, this may help to allow for different versions of the lock to be easily supplied with covers and end plates of different colours for aesthetic purposes.

It will be understood that whilst the lock body may contain many of the internal
30 mechanisms and associated components of the lock, certain components of the lock including the handle and also the key barrel (see below) may be positioned externally of the body, or may extend outwardly from within the body.

The lock body may be made from any suitable material, but preferably metals, resilient plastics or combinations thereof. Also, the lock body may contain whatever fittings are necessary in order to mount the various lock components within the body, and it may be shaped so as to allow the necessary operation of the components of the mechanism therein. It is envisaged that in most embodiments, the lock body may be substantially rectangular when viewed in a plan orientation and will typically have a length of between 5-30 centimetres, a width of between 2-10 centimetres, and a depth of between 1-5 centimetres. Of course, the dimensions of the lock body may be varied to suit the application and no particular limitation is meant in relation to the dimensions or shape of the lock body or the lock.

As explained above, the lock has a lock tongue. The lock tongue may be a sliding lock tongue of the kind that inserts into a strike situated in a door frame. Lock tongues such as this are commonly used on swinging doors, and if the lock tongue is a sliding lock tongue the strike will typically have a recess therein so that insertion of the lock tongue into the recess when the door is closed prevents the door from swinging open.

If the lock tongue is a sliding lock tongue, it may be provided with a bevelled or sloped "ramp" like nose portion that may cause the lock tongue to be pushed back into the lock body when the lock tongue contacts the strike as the door is closed. Lock tongues of this general kind are common on swinging doors. The lock tongue may also be provided with an array of ridges which may engage with an edge or ridge of the strike to improve the security of lock in the event that an attempt is made to force the lock tongue.

Alternatively, the lock tongue may be a rotating lock tongue. A wide variety of shapes, sizes and configurations of rotating lock tongue may be used with the present lock, and rotating lock tongues may be particularly useful where the lock is applied to sliding doors.

In preferred embodiments that operate with a rotating lock tongue, the lock tongue may have a substantially hooked shape adapted to engage with a correspondingly hooked nose of the kind found on many current sliding door strikes (see above). In

these embodiments, the general operation of the lock tongue may be described as follows. When the door is slid closed, the lock may be brought into engagement with the strike. The hooked portion of the rotating lock tongue may then come to engage with the corresponding hooked portion of the nose of the strike, and this engagement
5 may prevent the lock (and therefore the door) from being withdrawn with respect to the strike.

The position of the lock tongue wherein the lock tongue prevents the door from being slid or swung open may be referred to as the latching position of the lock tongue. In
10 the case of a sliding lock tongue, the latching position is generally where the lock tongue is inserted into the strike to prevent the door from swinging open. For rotating lock tongues, the latching position is generally where the hooked portion of the lock tongue engages with the corresponding hooked portion of the nose of the strike to prevent the door from being slid out of engagement with the strike. However, these
15 explanations are not intended to limit the invention in any way, and those skilled in the art will appreciate any position of the lock tongue that prevents the door from being opened constitutes the latching position.

The lock tongue in the present lock is moved by operating the handle of the lock. For
20 sliding lock tongues, the handle may engage with the lock tongue via a lock tongue retracting mechanism so that operation of the handle (typically by turning or sliding the handle) causes the lock tongue to retract out of the strike, thereby allowing the door (generally a swinging door) to open. Lock tongue retracting mechanisms such as this are in common usage with sliding lock tongues.

25 In the case of a rotating lock tongue, the handle may be operatively associated with the lock tongue so that the movement of the handle causes the lock tongue to rotate out of engagement with the nose of the strike. In preferred embodiments, an elongate spindle member may be provided that is operatively associated with the handle and
30 the lock tongue so that pivoting the handle causes the lock tongue to rotate. The spindle may be a solid spindle, or a split or partial spindle, and it will preferably have a square, rectangular or other non-circular cross-section.

In either case, (i.e. for sliding lock tongues or rotating lock tongues), when the lock tongue is moved into a position whereby the door is able to be opened, the lock tongue may be said to be in the free position.

- 5 The lock tongue of the present invention may be biased towards the latching position so that when the lock is brought into engagement with the strike (in the case of sliding doors), or when the lock tongue enters the recess in the strike (in the case of swinging doors), the lock tongue may move under the bias into the latching position. Any form of spring, compliant member or other biasing means may be used for this purpose.
- 10 However, for rotating lock tongues the lock may also incorporate a means for holding the lock tongue back in the free position against the above-mentioned bias. This "hold back" means may prevent the rotating lock tongue from moving into the latching position except when the lock is fully engaged with the strike, thereby preventing the hooked portion of the lock tongue colliding with the front of the strike
- 15 nose, which might otherwise cause damage to the lock tongue. The hold back means may not be necessary for sliding lock tongues because sliding lock tongues may be provided with a bevelled nose which causes the lock tongue to retract into the lock upon contact with strike. Therefore, contact between the sliding lock tongue and the strike as the door is closed may be less likely to cause damage to a sliding lock
- 20 tongue.

- The hold back means that may be used with rotating lock tongues will generally be engaged to retain the lock tongue in the free position when the lock tongue is moved into the free position by the handle (i.e. when the handle is operated to open the door).
- 25 The hold back means may then retain the lock tongue in the free position until the door is closed and the strike is thereby brought into engagement with the lock. When the strike engages with the lock, the hold back means may be triggered or otherwise disengaged to allow the lock tongue to move into the latching position under the influence of the biasing means. Preferably, the hold back means will not be
- 30 disengaged except upon full or substantially full engagement of the strike with the lock. This may help to ensure that the hold back means is not accidentally disengaged before the door is closed, and consequently the hold back means may help to ensure that the lock tongue cannot move into the latching position to "close" or "lock" the lock except when the door is closed.

The handle of the present lock may be of any size, shape or configuration suitable to enable the handle to be manually operated (typically by hand), and as explained above, in locks with a rotating lock tongue preferred forms of the handle may operate with a spindle for operatively associating the handle with the lock tongue. Examples of the kinds of handle that may be used include conventional door knobs or levers, or the pivoting lever-like members commonly used on sliding doors. The handle will typically be made from relatively stiff and strong materials such as metals or resilient plastics.

It is envisaged that most embodiments of the present lock will be provided with a plurality of handles, and more preferably two handles, one for each side of the door. However, no particular limitation is meant thereby and the lock can operate with only one handle (i.e. on one side of the door). In embodiments where only a single handle is used, there may be no need for a mechanism for selecting which of the handles can operate the snibbing mechanism. In the case of multiple handles, each handle may be the same or different.

The present lock contains a locking member which is movable between an unlocking position, and a locking position. Typically, when the locking member is in the locking position the lock tongue will be locked in the latching position, and when the locking member is in the unlocking position the lock tongue will be able to move between the free position and the latching position. Various types of locking members can be used. One type of locking member may comprise a sliding or reciprocating locking member. Another type of locking member may comprise a rotating locking member. Furthermore, preferred forms of the locking member may comprise a member which has sliding movement and also pivoting or rotating movement.

The locking member may comprise an engaging portion for engaging with the lock tongue to lock the lock tongue in the latching position when the locking member is in the locking position. For rotating lock tongues, the engaging portion may comprise an abutment or a number of abutments for abutting against the lock tongue to prevent the lock tongue from rotating out of the latching position (i.e. out of engagement with the

nose of the strike). Alternatively, if the lock tongue is a sliding lock tongue, the engaging portion may comprise a protruding portion for inserting behind the lock tongue, or into a recess in the lock tongue, to retain the lock tongue against retracting back into the lock body. However, it will be clearly appreciated that many other
5 forms of engaging portion may be provided on the locking member to lock the lock tongue, and all such forms are considered to fall within the present invention. The locking member may also be shaped to enable it to cooperate with other components of the lock, as described in greater detail below.

10 The locking member of the present lock is to be movable between a locking position and an unlocking position. In preferred embodiments of the lock, the locking member may also been movable into a third position, namely a deadlocking position, by operating a key barrel. Movement of the locking member into the deadlocking position may have a similar effect as moving the locking member into the locking
15 position in that the locking member may then lock the lock tongue in the latching position. However, the difference between the locking position and the deadlocking position of locking member may be that, in the deadlocking position, it may be necessary to operate the key barrel, which is operatively associated with the locking member, in order to move the locking member from the deadlocking position back
20 into the unlocking position. Hence, when the locking member is in the deadlocking position, the lock may be deadlocked and may not be operable using the handle(s).

As explained above, it may only be possible to move the locking member back from the deadlocking position to the locking position using the key barrel. Once the
25 locking member is returned to the locking position, it may also be possible to use the key barrel to move the locking member from the locking position into the unlocking position, or the lock tongue may alternatively be returned from the locking position to the unlocking position using the improved snib mechanism (see below).

30 Preferably, a stop member may be provided in the lock against which a part of the locking member may abut when the locking member is in the deadlocking position. A biasing or other retaining means may also be provided to maintain the locking member in the deadlocking position until it is moved back out of the deadlocking position using the key barrel. This may insure that, when the locking member is in

the deadlocking position, it cannot be forced or inadvertently moved back into the locking all unlocking positions. Only operation of the key barrel may return the locking member back from the deadlocking position.

- 5 The handle of the present lock may have a "dual function". One function of the handle may be to operate the lock tongue to move it from the latching position to the free position so that the door can be opened. The other function may be to operate the actuator in order to move the locking member between the locking position and the unlocking position (i.e. to snib and un-snib the lock). This second function may be
10 achieved using the actuator, which may form a part of the improved snib mechanism.

The actuator of the present lock may comprise a single unitary component, or a plurality of co-operating components that together form an actuator mechanism. In preferred forms of the present lock, the actuator may comprise a rack member. In
15 particularly preferred embodiments, the rack member may be a unitary and substantially elongate plate-like component. The rack member will preferably be movable in a substantially linear manner. A snib member may also be provided. The snib member may be a substantially elongate arm-like component pivotably mounted at one of its ends to the lock body, and the snib member may be engageable and
20 disengageable with the rack member.

It will be appreciated that the actuator of the present invention is not limited to the rack member described above, and no particular limitation is meant in relation to the form of actuator that may be used. Also, to avoid confusion it will be clearly
25 understood that the rack member or other actuator, the snib member, and any other components which may form part of the improved snib mechanism in various embodiments, are internal components of the lock. There is no separate snib operating lever or button (i.e. separate from the main operating handle of the lock) on the exterior of the lock.

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Preferred forms of the lock may have a hub which is movable by the handle, and the actuator (i.e. the rack member in preferred embodiments) may be operatively associated with the hub so that movement of the hub moves the actuator. Therefore, in preferred embodiments which utilise a rotating lock tongue, the hub may be

mounted to, and pivotable by, the spindle that operatively associates the handle with the lock tongue. The hub may also have a series of teeth which may mesh with corresponding teeth in the rack member. Consequently, when the handle is used to rotate the hub in one direction, the rotation of the hub and the meshing engagement of the hub with the rack member may cause the rack member to move in a linear direction. Similarly, rotation of the hub in the other direction may cause movement of the rack member in the other linear direction.

As explained above, the actuator may be operatively associated with the locking member such that movement of the actuator moves the locking member. This may be achieved in preferred embodiments by the above-mentioned snib member. More particularly, linear movement of the rack member in one direction (caused by rotating the handle and therefore the hub) may cause the rack member to engage the snib member. Following this linear engagement, further linear movement of the rack member in the said one direction may cause the snib member to pivot about its pivotally mounted end. The other end of the snib member may engage with the locking member so that pivotal movement of the snib member causes the locking member to move from the unlocking position into the locking position (i.e. to snib the lock from the passage mode into the safety mode). Conversely, sliding movement of the rack member in the other direction (caused by rotating the handle and the hub in the other direction) may cause the snib member to move the locking member from the locking position back into the unlocking position (i.e. un-snibbing the lock and returning it from the safety mode to the passage mode), and the rack member may then disengage from the snib member with further rotation of the handle and the hub.

The position of the actuator wherein the actuator causes the locking member to adopt the locking position may be referred to as the second position of the actuator. In the preferred embodiments described above, the second position is where the rack member is engaged with the snib member and in which the snib member is pivoted to move the locking member into the locking position. However, the invention is not limited to this embodiment and any position of the actuator that causes the locking member to adopt the locking position constitutes the second position, irrespective of whether the actuator comprises a single unitary actuator component or a multi-component actuator mechanism. Conversely, the position of the actuator where the

actuator does not cause the locking member to adopt the locking position may be referred to as the first position of the actuator.

It will be recalled that the lock tongue is movable between a free position and a
5 latching position, and that the handle may be operatively associated with the lock
tongue so that the lock tongue may be moved between the free and latching positions
by moving the handle. Consequently, the handle may also be considered to move
between a free position and the latching position. It will also be recalled that another
function of the handle in preferred embodiments is to operate the hub and the actuator
10 to snib the lock when the lock tongue is in the latching position. To enable this, the
handle may be able to rotate past its latching position into a "snibbing" position. In
embodiments which utilise a handle and a spindle, the hub may be connected to the
spindle such that rotation of the handle past the latching position into the snibbing
position may cause the hub to rotate into a corresponding snibbing position, thereby
15 operating the actuator and the locking member to snib the lock as described above.

Whilst some embodiments of the present lock may comprise a hub as described
above, preferred embodiments which have a pair of handles may comprise a pair of
hubs, with one hub on either side of the lock tongue, and each hub associated with a
20 respective handle. Both of the hubs may have the teeth described above, but the
actuator (i.e. the rack member in preferred embodiments) may engage with only one
or other of the hubs at any one time. Furthermore, a mechanism may be provided to
enable selective interchange between which of the hubs the rack member engages
with. Preferably, this hub selector mechanism may comprise a rotatable cam member
25 with a portion that engages with the rack member so that rotation of the cam in one
direction moves the rack into engagement with the hub on one side of the door, and
rotation of a cam in the other direction moves the rack into engagement with the hub
on the other side. However, any other component or mechanism suitable for enabling
selective interchange between which of the hubs engages with the rack member at a
30 given time is considered to fall within the scope of the present invention.

Because the actuator may engage with only one of the hubs at any given time, and
because each respective hub may be associated with only one of the respective
handles, therefore it may only be possible to operate the actuator using the handle on

the side of the door where the hub is engaged with the actuator (the "engaged" handle). The handle on the other side of the door (the "disengaged" handle) may be disengaged from the actuator, and therefore any attempt to snib or un-snib the lock by moving the disengaged handle may have no effect.

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The lock may also be configured so that when the engaged handle and the corresponding hub are rotated to snib the locking member into the locking position, the disengaged handle cannot be used to open the door by moving the lock tongue. This may effectively place the lock in the safety mode. In particularly preferred
10 embodiments which utilise a rotating lock tongue and wherein the locking member abuts with the lock tongue when the locking member is in the locking position, the contour of at least a portion of the abutting surface on the locking member may substantially conform to the contour of the adjacent abutting surface of the lock tongue. Furthermore, the abutting surface portion of the locking member that
15 conforms with the lock tongue may comprise a substantially block-like protrusion, or a series of such protrusions, which may extend into corresponding substantially block-shaped recesses in the lock tongue. Therefore, any attempt to open the lock using the disengaged handle when the locking member has been snibbed into the locking position, (or when the locking member is in the deadlocking position) may cause an
20 edge or edges of the block-shaped recesses in the lock tongue to contact with corresponding edges of the block-like protrusion of the locking member, preventing the lock tongue from rotating to open the lock.

It is envisaged that the lock will generally be configured such that the handle on the
25 outside of the door is the disengaged handle and a handle on the inside of the door is the engaged handle. This may allow the lock to be converted between the passage mode and the safety mode by operating the inside handle between its latching position and its snibbing position.

30 As noted previously above, the lock of the present invention may optionally form a part of a multipoint lock assembly. To achieve this, the lock may be provided with attachment means attachable to a remote lock operator to enable the remote lock operator to operate one or more remote locks or latches, preferably without any "play" or other lost motion. The attachment means may be operatively associated with the

locking member so that movement of the locking member ultimately causes operation of the remote locks. Even more preferably, the attachment means may be connected to the locking member, or may be integrally formed with the locking member.

- 5 The locking member may have a portion thereof extending towards the rear of the lock. To avoid confusion, the front of the lock is the region proximate the door jam and/or strike when the door is closed, and the rear of the lock is the region the opposite the front. The portion of the locking member that extends towards the rear of the lock may take the form of an elongate finger, a plate, a section or a block-like member, or any other form. Suitably, the said portion of the locking member may be
10 provided with the attachment means.

- The attachment means may comprise any type of attachment means which can engage with a remote lock operator to move the operator. One type of attachment means may
15 comprise a socket or recess in the locking member, and typically on the portion of the locking member that extends towards the rear of the lock. A projection or like member on the remote lock operator can be held in the socket or the recess to operate the remote locks. Alternatively, the attachment means may comprise a projection, pin, button, knob, finger or a plurality of such features which engage with a recess,
20 socket or other such feature in the remote lock operator.

- Furthermore, the attachment means may be provided with means for ensuring that the remote lock operator cannot easily be disengaged from the locking member. This may be achieved using a press fit arrangement, a snap fit arrangement or other forms
25 of arrangements or fasteners such as screws, pins, slide lock arrangements and the like.

- The lock may also be provided with means for visually indicating whether the lock is "locked" (un-openable) or "unlocked" (openable). Preferably, the visual indicating means may indicate whether the lock is in the passage mode, the safety mode or the deadlocking mode. The visual indicating means may comprise a mechanism having an indicator and a driving mechanism for driving the indicator. However, no particular limitation is meant thereby and many other forms of indicating means may be used, for example electronic or electronically illuminated indicating means.
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In preferred embodiments where the indicating means has an indicator, the indicator may be visible through an aperture in the lock furniture, and preferably the indicator may be movable so that only a portion of the indicator may be visible through the aperture at any given time. The different portions of the indicator visible at different times may be marked differently so as to indicate whether the lock is in the passage, safety or deadlocking mode. The marking on the different portions of the plate may comprise any form visible indicia, such as colour coding, patterns, writing, symbols, luminescent paints or materials and the like. For example, in some embodiments a portion of the indicator that is coloured red may be displayed when the lock is deadlocked. Similarly, a yellow portion of the indicator may be displayed when the lock is snibbed to the safety mode (i.e. when the locking member is in the locking position), and a green portion may be displayed when the lock is in the passage mode. However, no particular limitations meant thereby.

The indicator may comprise a movable component such as a sliding plate, or more preferably a rotating disk or partial-disk. In preferred embodiments where the indicator comprises a rotating partial-disk, the driving mechanism for the indicator may comprise a drive gear and a drive component. The drive component may comprise a substantially plate like member having a series of teeth on one edge thereof. The drive component may also be operatively associated with the key barrel mechanism so that the drive component moves substantially in accordance with the operation of the key barrel, or with the movement of a moving part or parts of the key barrel.

The drive gear may comprise a spur-like gear having gear teeth extending around at least a portion of its circumference. The drive gear may be operatively associated with the rotating indicator by way of a spindle member or axle member so that rotation of the drive gear rotates the indicator. Suitably, the teeth of the drive gear may mesh with the teeth of the drive component so that movement of the drive component between passage (open), safety (snibbing) and deadlocking indicating position causes the drive gear to rotate between corresponding passage, safety and deadlocking indicating positions. The rotation of the drive gear may cause the indicator to rotate between corresponding passage, safety and deadlocking indicating

positions, exposing a differently marked portion through the aperture in the lock furniture in each said position. This may then visibly indicate the mode that the lock is in.

- 5 In a second form, the present invention resides in a lock having a lock tongue which is movable between a latching position and a free position, and a snib mechanism for locking the lock tongue wherein the side of the lock from which the snib mechanism can be operated is selectably interchangeable.
- 10 Features described with reference to the first form of the invention may also be used with, or form part of, embodiments of the second form of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

- Certain embodiments of the lock of the present invention will now be described (by
15 way of non-limiting example only) with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a casing that forms part of the lock body used with some embodiments of the present lock;

- Figure 2 is a perspective view of the internal face of part of the lock
20 furniture that may be used with some embodiments of the present lock, where the lock incorporates the visual indicator of Figure 12;

Figure 3 is a perspective view of the external face of the part of the lock furniture shown in Figure 2;

- Figure 4 shows a lock mechanism in accordance with one embodiment of
25 the present invention, wherein the lock is "open" and certain components including the hub and the strike have been omitted for clarity;

Figure 5 shows the lock mechanism shown in Figure 4, wherein the lock is "closed" but unlocked, and the hub and strike are shown;

- Figure 6 shows the lock mechanism shown in Figures 5, wherein the lock
30 is "snibbed";

Figure 7 shows the lock mechanism shown in Figures 5-6, wherein the lock is "deadlocked";

Figure 8 is a partial perspective view of the lock tongue, locking block, hub, rack component, snib arm and rotatable eccentric cam device used with the embodiments shown in Figures 4-7 and 11;

Figure 9 shows various views of the rack member shown in Figure 8;

Figure 10 shows various views of the rotatable eccentric cam device shown in Figure 8;

Figure 11 shows a lock mechanism in accordance with another embodiment of the present invention, wherein the lock has a visual indicator mechanism;

Figure 12 shows the visual indicator shown in Figure 2 and used in the embodiment shown in Figure 11;

Figure 13 shows various views of the drive gear used in the embodiment shown in Figure 11;

Figure 14 shows various views of the drive plate used in the embodiment
15 shown in Figure 11;

Figure 15 shows a perspective view illustrating the visual indicator mechanism and key barrel used in the embodiment shown in Figure 11;

Figure 16 shows a further perspective view of the visual indicator mechanism, the key barrel and the locking member according to the embodiment shown in Figure 11;

Figure 17 shows a particular form of end cap that may be used on some embodiments of the present lock;

Figure 18 shows a particular form of side plate that may be used on some embodiments of the present lock;

25 Figure 19 shows an alternative form of end cap and cover plate that may
be used on some embodiments of the present lot; and

Figure 20 shows yet a further alternative form of end cap and the cover plate that may be used on some embodiments of the present lock.

30 BEST MODE

Figures 4-7 show a lock 10 in accordance with a first embodiment of the present invention. Lock 10 is adapted to cooperate with a strike 12, and strike 12 has a protruding hooked nose 14. Nose 14 is oriented so that the hook is disposed generally downwardly. Strikes such as this which have a protruding hooked nose are

commonly used with sliding doors (they are typically positioned on the door jam or on the opposing sliding door), and therefore lock 10 is generally adapted for use in sliding doors. Similarly, lock 10' shown in Figure 11 (which is an alternative embodiment that is discussed further below) is also adapted for use with sliding doors.

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Lock 10 has a lock tongue 16 mounted within a casing 18. Casing 18 is shown in Figure 1 and forms a part of the lock body. Lock tongue 16 is a rotatable lock tongue which can pivot between a free position (shown in Figure 4) and a latching position (shown in Figures 5). It can be seen from Figures 4 and 5 respectively that lock
10 tongue 16 pivots counter-clockwise (in this view) into the free position, and clockwise (in this view) into the latching position. The lock tongue is also biased towards the latching position by spring member 19.

Lock tongue 16 can be pivoted from the latching position to the free position using the
15 lock's operating handles. One of the lever-like operating handles (ie the operating handle for one side of the lock) is shown in Figure 3 by reference numeral 20. Handle 20 has as an elongate, square cross-sectioned spindle 15 (shown in Figure 2) which inserts into the lock to functionally associate handle 20 with lock tongue 16. More specifically, spindle 15 inserts into, and mates with hub 50 (see below) which is
20 engaged with lock tongue 16 such that pivoting handle 20 (and therefore pivoting spindle 15) causes lock tongue 16 to pivot correspondingly.

Lock tongue 16 has a hooked portion 22. It also has a contact portion 24 which faces the front of the lock. Hooked portion 22 is oriented generally upwardly so that when
25 the door is closed bringing strike 12 into engagement with lock 10 (as shown in Figures 5), hooked portion 22 of lock tongue 16 engages with the downwardly oriented hooked nose 14 of strike 12. This prevents the lock (and therefore the door) from retracting with respect to the strike when the strike inserts into the lock (ie when the door is closed). The purpose of contact portion 24 of lock tongue 16 is to provide
30 extra security to the lock. In the event that an attempt is made to force the lock by applying force to retract the lock away from the strike without moving the lock tongue into the free position, this force may cause contact portion 24 to come into contact with detent 26 of casing 18. This can help to prevent lock tongue 16 from giving way under the stress created by the applied force. It will be appreciated from the figures

that very little flexure or deformation of lock tongue 16 is required for contact portion 24 to come into contact with detent 26.

Lock 10 may be "opened" by operating handle 20 to rotate lock tongue 16 (counter-clockwise in this view) so that hooked portion 22 moves out of engagement with strike nose 14 and into the free position. When hook portion 22 moves out of engagement with nose 14, lock 10 (and hence the door) can then be retracted from the strike without lock tongue 16 contacting nose 14. This allows the door to be opened, and to illustrate this Figure 4 shows lock tongue 16 in the free position and strike 12 is not visible, indicating that the door is retracted away from the strike.

Lock 10 comprises a hold back member 28 which is biased to pivot in the clockwise direction (in this view) by hold back spring 31. Hold back member 28 also has a notch 30. Notch 30 is adapted to capture the peg 32 (which is integrally formed on the top of lock tongue 16) when the lock tongue is pivoted into the free position. To appreciate this, it is useful to observe Figure 5 wherein lock tongue 16 is illustrated in the latching position (and hence peg 32 is free of notch 30). Then, when lock tongue 16 is pivoted into the free position, peg 32 becomes aligned with notch 30 and hold back member 28 then pivots under the bias of spring 31 to capture the peg in the notch, as shown in Figure 4. Once peg 32 is captured by notch 30, the bias on lock tongue 16 created by spring member 19 (which biases the lock tongue in the clockwise direction) causes peg 32 to push against the side of notch 30, maintaining peg 32 in notch 30 and thereby preventing the lock tongue from rotating back into the latching position (until the hold back member is disengaged as described below). Hence, engagement of peg 32 with notch 30 prevents lock tongue 16 from moving into latching position to "close" or "lock" the lock when the door is opened.

Figure 5 illustrates that hold back member 28 disengages to allow lock tongue 16 to pivot back into the latching position when strike 12 inserts substantially all the way into the lock (i.e. when the door is closed). Upon substantially full insertion of strike 12 into the lock, the front edge of strike nose 14 pushes on hold back member 28, causing the hold back member to pivot counter-clockwise (as shown in this view) against the bias of hold back spring 31. When hold back member 28 pivots counter-clockwise, notch 30 also rotates thus releasing peg 32 and thereby allowing lock

tongue 16 to pivot clockwise into the latching position. The contact between nose 14 and hold back member 28 then maintains hold back member 28 away from peg 32 until the lock tongue is again pivoted into the free position to open the lock, and the door is withdrawn from the strike (so that strike nose 14 withdraws out of the lock),
5 whereupon the capture of peg 32 in notch 30 described above is repeated.

Lock 10 also has a locking member in the form of locking block 40 which is movable between an unlocking position (Figures 4-5), a locking or "snibbing" position (Figure 6), and a deadlocking position (Figure 7). In the unlocking position, locking block 40
10 is positioned generally towards the bottom of the lock (as shown) so that lock tongue 16 can pivot between its free position and latching position without contacting the upper portion of locking block 40. In contrast, in the snibbing position, locking block 40 is moved generally upwardly within the lock so that the upper portion of locking block 40 contacts with the underside of lock tongue 16 holding lock tongue 16 in the
15 latching position and preventing it from pivoting back into the free position. Finally, in the deadlocking position, locking block 40 is again positioned upwardly to block "freeing" of the lock tongue, but it is also rotated slightly in the clockwise direction compared with the snibbing position (as indicated by arrow "A" in Figure 7) so that land 42 at the base of locking block 40 abuts with shoulder portion 44 of casing 18.
20 This stops locking block 40 from moving back downwardly into the unlocking position, except when it is moved out of the deadlocking position using the key barrel as explained further below. The unlocking and snibbing positions, and the means by which locking block 40 is moved between these positions, will also be described in greater detail below.

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It can be seen from Figure 8 that the top of locking block 40 has a substantially stepped, block-like configuration that is adapted to abut with, and generally tessellate with (i.e. conform to) the correspondingly stepped underside of lock tongue 16 when the locking block is in the snibbing and deadlocking positions. Furthermore, in the
30 present embodiment, the highest of the block-like portions on top of the locking block (indicated by reference 46) is adapted to insert quite snugly into the corresponding recess 48 in the underside of lock tongue 16 when the locking block is in the snibbing or the deadlocking position. This snug fit blocks lock tongue 16 from rotating into the free position, and it also helps to prevent lock tongue 16 from pushing locking block

40 back down into the unlocking position. Hence, when lock 10 is snibbed, the lock cannot be opened until it is "unlocked" using the key barrel mechanism or the internal snib mechanism (see below), both of which can be used to move locking block 40 from the snibbing position back into the unlocking position shown Figure 4. In particular, this prevents the outside "disengaged" handle (see below) from being used to open the lock when the lock is snibbed.

Similarly, there are two ways in which lock 10 can be operated to move locking block 40 from the unlocking position shown in Figures 4-5 into the locking or "snibbing" position of Figure 6. And again, one way is by operating the internal snibbing mechanism, and the other way is by using the key barrel.

In relation to the internal snibbing mechanism, the internal snibbing mechanism comprises a pair of hubs 50, an actuator in the form of a vertically sliding rack component 52, and a snib arm 54 one end of which is pivotably mounted to casing 18. The hubs 50 are positioned on either side of lock tongue 16 so that one hub is operated by the handle on one side of the door, and the other hub is operated by the handle on the other side of the door. However, because only one or other of the hubs (and not both) can engage with the snibbing mechanism at any one time (so that only one of the handles can be used to snib and un-snib the lock at any one time), the snib mechanism will therefore initially be described with respect to only one of the hubs. Hub 50 is shown in Figures 5-8 and 11, but is omitted from Figure 4 to provide a more unobstructed view of lock tongue 16.

As shown clearly in Figure 8, hub 50 comprises a generally round squat component having a square internal aperture 56 and a number of gear-like teeth 58 (although as few as one tooth may be used). Hub 50 also has sculpted abutments on its periphery for engaging with other components of the lock when the hub rotates as described below. The hub's square aperture 56 receives the square spindle 15 that extends inwardly from the handle 20, and the hub also engages with lock tongue 16 so that when the handle is used to open and close the lock (Figures 4 and 5 respectively), hub 50 moves between free and latching positions that correspond with the free and latching positions of lock tongue 16.

However, unlike lock tongue 16 which is unable to move past its latching position in the clockwise direction (in this view) because it engages with strike nose 14 and post 57 which protrudes from casing 18, hub 50 is able to rotate clockwise past its latching position shown in Figure 5 and into the snibbing position of the hub shown in Figure 6. This can be done by moving the handle past its latching position into its snibbing position.

When the handle 20 is used to move hub 50 into the snibbing position shown in Figure 6, the gear-like teeth 58 on hub 50 engage with corresponding grooves 60 in rack component 52, and therefore the rotation of hub 50 pushes rack component 52 downwardly in the lock. As rack component 52 moves downwardly in the lock from the first position shown in Figure 4-5 and into the second position shown in Figure 6, the two detents 62 that protrude from the base of rack component 52 come into engagement with the correspondingly shaped groove 63 in the pivotally mounted end of snib arm 54. Then, with further downward movement, rack member 52 pushes downwardly on the right-hand side (in this view) of the pivotably mounted snib arm 54, causing snib arm 54 to pivot in a clockwise direction (in this view) about its pivotal mount.

Next, it can be seen from Figure 8 that the free end 65 of snib arm 54 resides between a pair of ridges 64 on locking block 40. Therefore, when snib arm 54 pivots in the clockwise direction as described immediately above, this causes snib arm 54 to push on the upper ridge 64, thereby pushing locking block 40 upwardly from the unlocking position into the locking or "snibbing" position.

Hence, the operation of the internal snibbing mechanism to move locking block 40 from the unlocking position into the snibbing position may be summarised as follows. Handle 20 is first pivoted from its latching position into the snibbing position. Because handle 20 is connected to hub 50 via spindle 15, the rotation of handle 20 into the snibbing position causes hub 50 to rotate into its snibbing position. This causes teeth 58 on hub 50 to engage with the grooves 60 in rack component 52, pushing rack component 52 downwardly in the lock. The downward movement of rack component 52 in the lock brings detents 62 into engagement with groove 63 in snib arm 54, and further downward movement of rack component 52 causes snib arm

54 to pivot clockwise about its pivotal mount. Finally, the pivotal clockwise movement of snib arm 54 causes the free end 65 of the snib arm to push upwardly on the upper ridge 64 of locking block 40, thus pushing locking block 40 upwards into the snibbing position.

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Similarly, the internal snib mechanism can operate, effectively in reverse compared with the above, to return locking block 40 from the snibbing position into the unlocking position. Hence, to "un-snib" the lock, handle 20 is first pivoted from its snibbing position back into the latching position. This then causes hub 50 to rotate
10 back into its latching position. The gear-like teeth 58 on hub 50 thereby engage with the grooves 60 in rack component 52, urging rack component 52 back upwardly in the lock. This upward movement of rack component 52 causes detents 62 to pull upwardly on the snib arm's groove 63 pivoting the snib arm counter-clockwise about its pivotal mount. The pivotal counter-clockwise movement of snib arm 54 causes the
15 free end 65 of snib arm 54 to push downwardly on the lower ridge 64 on locking block 40, thus pushing locking block 40 back downwards into the unlocking position. Finally, the further upward movement of rack component 52 caused by the rotation of hub 50 back into the latching position, causes the lower detents 62 of rack component 52 to disengage from snib arm 54.

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As explained above, locking block 40 can also be moved between the unlocking position and the snibbing position using the key barrel. The key barrel is generally indicated by reference numeral 70. Figures 4-6 (also Figures 15-16) show that key barrel 70 has a cam member 72 extending from the side thereof. Cam member 72 is
25 pivotable around the periphery of key barrel 70 by inserting a key (not shown) into key barrel 70 and turning the key. It can also be seen from Figures 5-6 that when locking block 40 is in the unlocked position or the snibbed position, cam member 72 resides in a recess 74 situated in locking block 40 near the base thereof. It will therefore be appreciated that in order to snib the lock using the key barrel (i.e. to
30 move locking block 40 from the unlocking position into the snibbing position using the key barrel) a key must be inserted into key barrel 70 while locking block 40 is situated in its unlocking position (Figure 5). The key can then be turned and this will cause cam member 72 to rotate clockwise (in this view) about key barrel 70, whereupon cam 72 will push upwardly on the upper edge of recess 74, pushing

locking block 40 upwards into the snibbing position (Figure 6). Conversely, in order to "un-snib" the lock using the key barrel, a key may be inserted into key barrel 70 and turned counter-clockwise so that cam 72 pushes downwardly on the lower edge of recess 74, thus pushing locking block 40 back downwards into the unlocking position (Figure 5).

It will be appreciated that cam member 72 also moves as described above when the internal smoothing mechanism is used. In these instances, the cam member is effectively "dragged" up and down by the movement of locking member because the cam member remains engaged in the recess 74.

Key barrel 70 can also be used to move locking block 40 into its deadlocking position. In fact, it is not possible to deadlock the lock using the internal snibbing mechanism, and so the only way locking block 40 can be moved into the deadlocking position is by using the key barrel. In order to move locking block 40 from the unlocking position of Figure 4 into the deadlocking position of Figure 7, it is first necessary to insert a key into key barrel 70 and turn the key to move locking block 40 into the snibbing position as described above. This moves the upper block-like portion of lock block 40 into engagement with the underside of locking tongue 16, thereby "locking" the lock tongue as described above. However, further rotation of the key in key barrel is possible, and this causes cam 72 to rotate out of recess 74 in the locking block and into alignment with the body of the key barrel (see Figure 7). The way cam 72 can rotate into alignment with the body of the key barrel can also be appreciated from Figure 15.

It can be seen from Figures 4-7 that a spring 41 is mounted in compression between locking block 40 and the front edge of casing 18. Hence, spring 41 tends to push on the lower end of locking block 40, thereby generally biasing locking block 40 to rotate counter-clockwise (as shown in Figure 7 by arrow "A"). When locking block 40 is in the unlocking and snibbing position, the presence of cam 72 in recess 74 prevents the locking block from rotating under the bias of spring 41 because cam 72 effectively pushes back against the locking block preventing it from rotating. However, when the key barrel is operated to rotate cam 72 out of recess 74, the resistance provided by cam 72 to rotation of locking block 40 is removed, and locking block 40 is allowed to

rotate. The degree of rotation of locking block 40 is quite small, but it is sufficient to bring land 42 which protrudes from the base of locking block 40, into engagement with shoulder portion 44 of the casing. The engagement of land 42 with shoulder 44 deadlocks the lock because it prevents the locking block from moving downwardly in the lock (for example if an attempt is made to un-snib the lock using the internal snibbing mechanism). Therefore, the only way to "un-deadlock" the lock is to rotate the key counter-clockwise in key barrel 70 in order to rotate cam 72 out of alignment with the body of the key barrel and back into engagement with recess 74. When cam 72 re-engages with recess 74, this pushes back against the locking block causing the locking block to rotate clockwise (opposite to arrow "A") against the bias of spring 41, and hence moves land 42 out of engagement with shoulder 44. Hence, the lock is effectively returned to the snibbing position, and can then be unlocked or un-snibbed using the key barrel or the internal snibbing mechanism as described above.

As explained above, the lock in the embodiment shown is provided with a pair of hubs 50. The hubs 50 are positioned on respective sides of the lock tongue so that one hub is operable by one of the handles, and the other hub is operable by the other handle. It is also explained that only one of the hubs engages with the internal snibbing mechanism at any given time. This is so that only one of the handles (i.e. only the handle on one side of the door) can be used to snib and un-snib the lock, thus "locking" the door to access from the other side.

However, it will also be appreciated that in some situations the present lock will be configured so that one side of the lock faces the inside, whereas in other situations the other side of the lock will be configured to face the inside. Therefore, the present lock provides a mechanism for selecting which of the hubs (and therefore which handle) is able to engage with the internal snibbing mechanism, so that it may be ensured that the correct handle (typically the inside handle) is able to operate the snib mechanism, and the other handle is not.

To achieve this, the present lock is provided with an eccentric cam device 80 which can be used to move the rack component 52 from one side of the lock where the rack component engages with one of the hubs, to the other side where the rack component engages with the other hub. Cam device 80 is shown with the rest of the internal

snubbing mechanism in Figure 8, and individually in Figure 10. From Figure 10 it can be seen that cam device 80 is substantially disk-like. One face of the disk is provided with protrusions that define a narrow gap 82 therebetween. The gap 82 is adapted to receive a flat-headed screwdriver so that cam device 80 can be operated using a screwdriver, and gap 82 also has an arrow-like notch 83 that points towards the side of the lock, and hence the hub with which the rack component is engaged. The other face of cam device 80 (i.e. the face that is oriented towards the rack component 52 as shown in Figure 8) has a single eccentrically located protrusion 84. Eccentrically located protrusion 84 inserts into the corresponding slot 86 in rack component 52 (see Figure 9). Therefore, when cam device 80 is mounted as shown in Figure 8, cam device 80 can be rotated (using a screwdriver) thereby causing eccentric protrusion 84 to push on the side of slot 86 moving rack component 52 from one side of the lock to the other. As rack component 52 moves from one side of the lock to the other, the recesses 60 in rack component 52 disengage from the teeth 58 of one hub and engage with the teeth 58 of the other hub.

As explained above, lock 10 is adapted to optionally form part of a multipoint lock assembly. To achieve this, locking block 40 is provided with attachment means in the form of a finger portion 90 which extends towards the rear part of the lock. Finger portion 90 is adapted to be connectable to remote lock operators (not shown) which can take the form of remote lock operating rods, plates or combinations thereof. Typically, the remote lock operating rods/plates will be connectable to finger portion 90 using mechanical fasteners such as screws, rivets, sockets and the like, or snap fit arrangements.

Referring now to Figure 11, there is shown an alternative embodiment 10' of a lock in accordance with the present invention. Lock 10' operates generally in the same way as lock 10 described above, except that lock 10' also incorporates a visual indicator mechanism. The visual indicator mechanism comprises a drive component in the form of a drive plate 100, a drive gear 102, a drive spindle 104, and an indicator in the form of a rotatable partial-disk 106 (see Figure 2).

It can be seen from Figure 11 the drive plate 100 has a recess 108 therein which receives the key barrel's cam member 72, and which is generally similar to recess 74

in locking block 40. Therefore, drive plate 100 can be moved between passage, safety and deadlocking indicating positions by operating the key barrel mechanism or the internal snib mechanism in generally the same way as for the locking block. It can also be seen that the rear edge of drive plate 100 has a series of teeth that mesh with
5 corresponding teeth on drive gear 102 so that upward and downward movement of drive plate 100 causes respective clockwise and counter-clockwise rotation (in this view) of drive gear 102. This rotation of drive gear 102 is transmitted via spindle 104 to cause corresponding rotation of indicator 106. Thus, movement of drive plate 100 between the said passage, safety and deadlocking indicating positions causes indicator
10 106 to rotate into corresponding respective passage, safety and deadlocking indicating positions.

When indicator 106 is in the deadlocked indicating position, a part of the externally facing disk surface of the indicator will be visible through aperture 110 in the lock
15 furniture (see Figure 3). Similarly, when indicator 106 is in the safety and passage indicating positions, different parts of the external facing disk surface will be visible through aperture 110. The different parts of the indicator visible through aperture 110 when the indicator is in the respective indicating positions will be marked differently so as to clearly indicate the lock's current mode in a way that is visible from outside
20 the lock. Typically, red will be shown when the lock is deadlocked, yellow when the lock is snibbed (safety mode), and green will show when the locking block is in the unlocking position and the lock is in the passage mode.

Figure 17 shows a front end plate 112 that may be used with various embodiments of
25 the present lock. Similarly, Figure 18 shows a side plate or "cover" 113 that may be used with various embodiments. The front end plate 112 is provided with formed tabs 114 which may assist the die-cast mounting lugs on casing 18 in providing additional strength to the lock. Side plate 113 has a series of openings and apertures therein adapted for receiving, for example, spindle 15, key cylinder 70, etc.

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The particular embodiment shown in Figures 17-18 also incorporates an alternative lock tongue 16'. Lock tongue 16' is the same as lock tongue 16 described above, except that lock tongue 16' has an additional arcuate rib 116 thereon. An arcuate rib 116 may be provided on one or both sides of lock tongue 16'. Front end plate 112 and

side plate 113 incorporate apertures for receiving arcuate rib 116 in the different positions of the lock tongue 16'. The purpose of arcuate rib 116 and the receiving apertures in the front end plate and the side plate is to provide additional security to the lock against forcing (in addition to the engagement of contact portion 24 with
5 detent 26). In particular, if an attempt is made to force the lock by applying force to retract the lock away from the strike without moving the lock tongue 16' into the free position, this force may cause arcuate rib 116 to contact with the corresponding apertures in front end plate 112. This can help, in addition to the engagement of contact portion 24 with detent 26, to prevent lock tongue 16' from giving way under
10 the stress created by the applied force. The receiving aperture in side plate 113 receives the arcuate rib 116 when lock tongue 16 is pivoted into the free position.

Figures 19 and 20 show alternative versions of the end plate and the side plate that may be used. The embodiments in Figures 19 and 20 again incorporate the alternative
15 lock tongue 16'. However, in these embodiments, the arcuate rib 116 on lock tongue 16' remains received in a corresponding arcuate aperture 115 in side plate 133a/b. Apart from this, the operation of arcuate rib 116 is substantially as described above.

The alternative side plates 113a/b in Figures 19 and 20 are clip-on cover plates. They
20 clip-on as shown. The only major difference between the embodiment shown in Figure 19 and the embodiment shown in Figure 20 is that the one in Figure 20 incorporates flanges 120, 122 (with holes 124, 126 therein for receiving screws) for attaching the lock to the door or frame.

25 It should be appreciated that various changes and modifications can be made to the embodiments described and illustrated herein without departing from the spirit and scope of the invention.

CLAIMS:

1. A lock having a lock tongue which is moveable between a latching position and a free position, a handle to move the lock tongue, a locking member that is moveable between a locking position to lock the lock tongue and an unlocking position, and an actuator that is movable by the handle between a first position and a second position, characterised in that the actuator is operatively associated with the locking member so that movement of the actuator into the second position moves the locking member into the locking position.
2. A lock as claimed in claim 1, wherein the lock tongue is a rotating lock tongue.
3. A lock as claimed in claim 2, wherein the lock tongue has a hooked shape.
4. A lock as claimed in any one of the preceding claims, wherein the lock tongue is biased towards the latching position.
5. A lock as claimed in claim 4 comprising hold back means to prevent the lock tongue from moving into the latching position except when the lock is fully engaged with an associated strike.
6. A lock as claimed in claim 1, wherein the lock tongue comprises a sliding lock tongue.
7. A lock as claimed in claim 6, wherein the lock tongue is provided with an array of ridges adapted to engage with an edge or ridge of an associated strike.
8. A lock as claimed in either claim 6 or claim 7, wherein the lock tongue is biased towards the latching position
9. A lock as claimed in claim 1, wherein when the locking member is in the locking position the lock tongue is locked in the latching position, and when

the locking member is in the unlocking position the lock tongue can be moved between the free position and the latching position.

10. A lock as claimed in claim 9, wherein the locking member comprises an engaging portion for engaging with the lock tongue to lock the lock tongue in the latching position when the locking member is in the locking position.
11. A lock as claimed in claim 1, wherein the locking member is also movable into a deadlocking position by operating a key barrel.
12. A lock as claimed in claim 11, including to stop member in the lock against which a part of the locking member can abut when the locking member is in the deadlocking position to maintain the locking member in the deadlocking position.
13. A lock as claimed in claim 12, including biasing means to maintain the abutment between the locking member and the stop member until the locking member is moved back out of the deadlocking position.
14. A lock as claimed in claim 1, wherein the actuator is inside the lock.
15. A lock as claimed in claim 14, wherein the actuator comprises a single unitary component.
16. A lock as claimed in claim 15, wherein the actuator is a substantially elongate plate-like rack member.
17. A lock as claimed in claim 1, comprising a snib member inside the lock.
18. A lock as claimed in claim 14, wherein the actuator comprises a plurality of cooperating components that together form an actuator mechanism.
19. A lock as claimed in claim 2, comprising a plurality of handles.

20. A lock as claimed in claim 19, wherein each handle is operatively associated with the lock tongue by way of a spindle member so that, at least when the locking member is in the unlocking position, pivoting one or other of the handles causes the lock tongue to rotate.
21. A lock as claimed in claim 16 comprising a hub which is movable by the handle and which is operatively associated with the rack member so that movement of the handle moves the hub and the rack member.
22. A lock as claimed in claim 21, wherein the hub has at least one tooth which mesh(es) with (a) corresponding groove(s) on the rack member.
23. A lock as claimed in claim 17, wherein the actuator is operatively associated with the locking member by the snib member.
24. A lock as claimed in claim 23, wherein the snib member engages with the locking member so that movement of the snib member in one way causes the locking member to move from the unlocking position into the locking position, and opposite movement of the snib member causes the locking member to move from the locking position to the unlocking position.
25. A lock as claimed in claim 20, wherein each handle is movable into a free position causing the lock tongue to adopt the free position, a latching position causing the lock tongue to adopt the latching position, and a snibbing position.
26. A lock as claimed in claim 25, wherein a hub is connected to the spindle for each handle.
27. A lock as claimed in claim 26, wherein each hub has at least one tooth adapted to engage with (a) corresponding groove(s) on a rack member in the lock.
28. A lock as claimed in claim 27, wherein only one of the hubs (the "engaged hub") engages with the rack member at any one time.

29. A lock as claimed in claim 28, having a hub selector mechanism to selectively interchange between which of the hubs engages with the rack member (i.e. to change between which of the hubs is the engaged hub).
30. A lock as claimed in claim 29, wherein the hub selector mechanism includes a rotatable cam member with a portion that engages with the rack member so that rotation of the cam member in one direction moves the rack member into engagement with one of the hubs, and rotation of the cam member in the other direction moves the rack member into engagement with the other hub.
31. A lock as claimed in claim 30, wherein the handle associated with the engaged hub is the engaged handle, and wherein when the locking member is in the locking position, the engaged handle is the only handle that can be operated to move the locking member from the locking position to the unlocking position.
32. A lock having a lock tongue which is movable between a latching position and a free position, and a snib mechanism for locking the lock tongue wherein the side of the lock from which the snib mechanism can be operated is selectably interchangeable.
33. A lock having a lock body, a lock tongue which is moveable between a latching position and a free position, a handle to move the lock tongue, a locking member which is moveable between a locking position to lock the lock tongue and an unlocking position, a hub which is movable by the handle, and an actuator in the lock body which is operatively associated with the hub so that movement of the hub moves the actuator, wherein the actuator is movable between a first position and a second position and is operatively associated with the locking member so that when the actuator is in the second position the locking member is in the locking position.
34. A lock as claimed in claim 1 or claim 33 having visual indicating means.
35. A lock as claimed in claim 34, wherein the visual indicating means includes a rotating disk or partial disk inside the lock at least part of which is visible from

35. A lock as claimed in claim 34, wherein the visual indicating means includes a rotating disk or partial disk inside the lock at least part of which is visible from outside the lock so that differently marked portions of the disk or partial disk are visible when the lock is in different modes.
36. A lock as claimed in claim 35, wherein drive means are provided to move the disk or partial disk when the lock moves between the modes.
37. A lock as claimed in claim 1, having a body which includes a cover and an end plate and one or both of the cover and the end plate being provided with formed tabs for adding to the strength of the body.
38. A lock as claimed in claim 37, wherein at least one of the cover and the end plate is attachable to other parts of the body via a clip-on arrangement.
39. A lock as claimed in claim 1 forming part of a multipoint lock assembly.