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⑤④ KEY OPERATED MECHANISMS FOR LOCKS.

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Description

This invention relates to key-operated mechanisms for locks.

In some types of known key-mechanisms detainers are mounted in tier order within the depth of the lock-case. The number of different combinations of detainers is restricted by the need for the detainers to be mounted in symmetrical order and the inconvenient and expensive deep case needed to accommodate additional detainers. In other types of locks the key-mechanism is contained within a barrel or cylinder, and the detainers may take the form of pin-tumblers, wafers, sliders or pivoted and pivotless levers. However, two such key-mechanisms are necessary to enable key-operation from both sides of the lock. The lock is correspondingly more expensive and may only be used on relatively thick doors. Key mechanisms of the cylinder type are fitted to the door separately to the lock to which they are operatively connected and the need to cut away a substantial part of the thickness of the door to accommodate the cylinder weakens the door. The keyhole of such mechanisms on the outside of the door is vulnerable to attack and vandalism.

It is known from DE—C—846070 to have a casing comprising a basin-shaped locking member provided with locking flanges. A rotatable tumbler is axially aligned in the locking member and includes a number of transverse passageways each having a detainer which abuts the locking flanges to prevent relative axial rotation between the tumbler and the locking member. A key inserted displaces the detainers to a position where they no longer abut the locking flanges and allow relative axial rotation between the tumbler and the locking member.

In summary it is known to have a key operated mechanism for a lock including a rotatable member located within a lock casing and having an axial keyhole and a plurality of groups of angularly-spaced transverse passageways communicating with a keyhole and extending to the outer surface of the rotatable member, each passageway containing a detaining member biased towards the keyhole end of each passageway and arranged to slide along the passageway against the bias in response to the insertion and turning of a key in the keyhole thereof, a locking member fixed to the casing and being formed with a plurality of spaced projections defining slots therebetween located adjacent the passageways in the rotatable member, the disposition of the passageways corresponding with the disposition of the slots in the locking members such that when the rotatable member is in a predetermined angular position the passageway and slots are in register, each detaining member having slot arranged to align with said projections when the detaining member is moved along the respective passageway against the bias to a predetermined position such as to allow relative rotation between the rotatable member and the locking member and a key having two groups of indents

axially spaced along the shank of the key, one of said groups being arranged to impart sliding movement to the detaining members against the bias when the key is inserted from one side of the mechanism and turned and the other group being arranged to impart sliding movement to the detaining members when the key is inserted from the other side of the mechanism and turned.

The present invention seeks to provide a key-operated mechanism capable of being mounted within a lock-case of relatively small thickness to reduce restrictions on where it may be used. The mechanism is capable of being operated from each side of the lock and may provide a large number of different combinations of detainers in relation to the quantity of detainers incorporated in the mechanism.

The present invention is characterised in that said detaining members are located wholly within the respective passageways in the rotatable member and arranged therein such that removal therefrom cannot be effected without removal of the key mechanism from the casing, and the mechanism includes a pair of locking members secured respectively to the inside surfaces of the casing and a cover plate therefor, the rotatable member being located and journaled between the two locking members.

The locking member may include a series of arcuate flanges disposed in a ring and extending generally parallel to the keyhole the spaces between the flanges providing said angularly spaced openings, and a series of said detainers being located in a circular configuration, each having a slot for receiving said flanges, the slots in the series of detainers being located in the ring of the arcuate flanges when the detaining members are moved each to its respective predetermined position, thereby allowing the plug member and detaining members to be rotated with respect to the locking member.

The detaining members are arranged in two axially spaced circularly-configured series, the mechanism including two locking-rings with said arcuate flanges each locking ring co-operating with a respective series of said detaining members.

The present invention also provides a key as defined above and adapted to form part of the key-operated mechanism as aforesaid.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings.

In the drawings:—

Figure 1 is an axial sectional view of a key-mechanism in accordance with the present invention, showing the mechanism in a locked position.

Figure 2 is an elevation view of a locking-ring which is part of the mechanism of Figure 1;

Figure 3 is a radial sectional view of a plug which is part of the mechanism of Figure 1;

Figure 4 is an elevation view of a single detainer which is part of the mechanism of Figure 1;

Figure 5 is a transverse sectional view of the key mechanism of Figure 1;

Figure 6 is an elevational view of a key blank for use with the mechanism;

Figure 7 is an axial sectional view of the mechanism with the key entered from one side and in an unlocked position;

Figure 8 is an axial sectional view corresponding to Figure 7 but showing the key entered from the other side;

Figure 9 is a radial sectional view of an alternative form of plug and detainer; and

Figure 10 is an axial sectional view of an alternative construction of the locking rings.

A key-operated mechanism comprises a lock-case 1 and a cover plate 2 each having respective key holes, in register. The lock-case is of conventional mortice-lock size. Both the key holes in the lock case 1 and cover plate 2 are circular in cross-section, but, in addition, that of the cover plate 2 is restricted by a segmental projection 3 acting as a key abutment, described in more detail below. A pair of locking-rings 4 (one of which is shown separately in Figure 2) each comprise a circular plate portion 5 with a central circular hole. Each locking-ring has a ring of arcuate flanges 6 projecting perpendicularly from the radially outer margin of the plate portion 5. The arcuate flanges are separated by slots 7, these being disposed at predetermined positions around the locking-ring. One locking-ring is non-rotatably mounted to the inside face of the lock case and another non-rotatably mounted to the inside face of the cover plate 2 such that their circular holes are in register with the key holes in the lock-case 1 and cover plate 2, and so that the arcuate flanges 6 project inwardly.

A plug 8 (shown separately in Figure 3) is generally cylindrical in outline and formed with a central circular key-way. A pair of segmental projections 9 are located at one end of the plug keyway to define a slot 10 between them. The radially outer portion of the plug has two circumferential channels 11 and 12. The channels 11 and 12 are symmetrically spaced to leave an annular circumferential flange 13 between them and two outer circumferential flanges 14 and 15. Two sets of radial slots 16 are axially spaced along the plug, and within each set the radial slots 16 are spaced at angular intervals around the plug. Each slot 16 communicates with one of the channels 11, 12 at one end and with the plug key-way at the other. The disposition of the slots 16 in each set corresponds with the disposition of the slots 7 in respective ones of the locking rings. Longitudinal bores 17 are located through the annular flanges 13—15 at 120° intervals. The forward and rear faces of the plug 8 each have a circular recess 18 with a circular channel 19 at the margin of each recess 18 communicating with a slot 16, the recess and channel being configured to receive respectively the body and arcuate flanges 6 of a locking ring 4.

The plug 8 includes a cam 20 projecting from the outer surface of the outer circumferential flange 14 and replaceably fixed to the body of the plug, i.e. the cam 20 is capable of replacement by

a cam of different form without requiring alteration of the plug and the cam provides the operating connection between the key mechanism and other associated parts of a lock or bolt mechanism. The plug 8 is rotatably mounted in the lock case 1 between the locking rings 4, the arcuate flanges 6 of the locking rings being received in the channels 19 in the end faces of the plug.

A respective detainer 21 (shown separately, by way of example, in Figure 4) is located for sliding movement in each radial slot 16 of the plug. Each detainer 21 is generally flat and at one end is tapered. At its other, outer, end the detainer has a rectangular lateral protrusion 22, the surface 23 of which, being perpendicular to the main portion of the detainer, acts as an abutment surface, as is described below. Spaced from the lateral protrusion 22, towards its tapered end the detainer has a rectilinear slot 24. The distance between the slot 24 and the tapered end is a predetermined characteristic of each detainer. At its outer end the detainer has a bent portion 25 extending transversely to the plane of the main surface of the detainer.

Each detainer is located in one of the radial slots 16 in the plug 8, and extends through a slot 7 in one of the locking rings 4, the formed end of the detainer projecting outside the slot 16 in the plug to rest on the circumferential surface of one of the circumferential channels in the plug to prevent removal of the detainer through the keyhole and to limit the projection of the detainer into the keyhole.

The detainers 21 are urged towards the keyhole by spiral springs 26. The spiral of each spring is fixed to the plugs 8 by a pin 27 fixed in one of the bores 17 in the plug. One arm of each spring presses down on the bent end portion 25 of a detainer and, where convenient, the other arm of the spring bears on another one of the detainers.

Each detainer is urged into the keyhole until it abuts with the surface of the plug as aforesaid and in this position the slots 24 of the detainers are misaligned with the ring of arcuate flanges 6 on the locking ring. This position is shown in Figures 1 and 5, and it will be appreciated that the plug 8 is thus prevented from rotating within the case.

Referring to Figures 6 and 7 a key for the mechanism comprises a shank 28 of appropriate form to the keyhole, The shank is generally cylindrical, the forward portion being truncated longitudinally to leave a flat surface 29. The rear portion of the stem in line with the flat surface 31 of the rib 30 constitutes an abutment shoulder. The bow 32 of the key is made as part of, or fitted to, the shank at one end. The other end of the shank is tapered to enable the key, when entered into the keyhole, of the mechanism to impart initial movement, or lift, to each detainer 21. At the end of the forward portion of the shank, where it meets the rear portion it is provided with a circumferential groove 33.

Figures 7 and 8 show the fully formed key

including two equivalent sets 34a, 34b and 35a, 35b of indents, one set on either side of the groove 33. In the present embodiment of the invention the locking mechanism includes two sets of angularly spaced detainers. Thus each set of indents comprises one angularly spaced series of indents 34a, 34b, 35a, 35b. Each indent is counter-sunk to ensure the easy lift of the detainers as the key is entered or withdrawn and provided with a flat base to co-operate with the tapered end of the detainers.

The key may be entered into the mechanism from either side. Figure 7 shows the key entered from the cover plate side. To enter the key it must be disposed such that its flat surface 29 is flush with the upper surface of the segmental projection 3 in the cover plate. The key is inserted until the abutment shoulder 31 of the rear portion of the shank of the key abuts the outer face of the cover plate. The circumferential groove 33 in the shank enables the key to be rotated with the wall of the cover plate being accommodated in the groove. The key will rotate in this position only and thus correspondence between the forward series of indents 34a, 34b and the detainers 21 is assured.

Figure 8 shows the key entered from the lock-case side of the mechanism. The shoulder 31 of the rear portion of the shank of the key abuts the inside face of the segmental projection 3 on the cover plate and further insertion is prevented. The groove 33 in the shank again accommodates the wall of the cover plate to allow the key to rotate. When entered in this way the two series of indents 35a, 35b nearer the bow of the key are located in register with the two sets of detainers 21.

The indents in each set 34a, 34b are symmetrically identical as are the indents in each set 35a, 35b. Each set comprises two series of angularly spaced indents each conforming with a respective one of the sets of detainer positions. The indents are of a predetermined depth to provide the necessary lift to each detainer to align the slot 24 in each detainer with the ring of arcuate flanges 6 in the locking ring. When the key is entered from the cover plate side (Figure 7) the flat surface 29 of the key lies flush against the flat surface of the segmental projections 9 in the keyway of the plug 8. Thus rotation of the key in the casing causes the plug 8 also to rotate. When the key is entered from the lock-case side of the mechanism (Figure 8) the forward portion of the key projects beyond the lock mechanism and the longitudinal rib 30 in the rear portion of the shank fits in the slot 10 between the projections in the plug. Thus the plug is constrained to rotate with the key. Rotation of the plug results in the rotation of its cam portion 20 which in turn contacts associated parts for operation of the locking mechanism.

It will be appreciated that during rotation of the key in the mechanism one of the sets of indents 34a,b or 35a,b is outside the mechanism and rotates without hindrance. Such an arrangement

does not necessitate any alteration in shape, or enlargement, of the keyhole.

In an alternative version the indents are formed by terminating a tapered slot, extending from the tapered end of the key, at a position and depth to provide the predetermined lift to the respective detainers. To deter unauthorised operation of the mechanism, by for example, picking (which comprises the use of an instrument, other than a key, in the keyhole to lift the detainers to the position for rotation of the plug) one or more detainers may be provided with a shallow rectangular recess across its side surface for engagement with the locking-ring. The shallow recess is so positioned on the detainer to align the shallow slot to the locking ring when the detainer is in a non-fully lifted position. The application of torque to the plug will serve only to cause engagement between the locking ring and the shallow recess. As a further security precaution one detainer may be arranged to require no lift to align its slot with the locking ring. The indent in the key corresponding to this detainer will therefore need to be of greater depth than usual and will not then lift the detainer at all. At attempt to pick the lock by raising all the detainers will cause this detainer at least to be misaligned.

The detainers may be of square or rectangular section with a part of the length reduced in size or formed in diameter to provide a spherical radius at one end for contact with the key. A shoulder is included on the detainer to prevent removal of the detainers through the keyhole and to determine the amount of projection of the end of each detainer into the keyhole in the plug.

Alternatively the detainers may be curved or bent along their lengths to increase resistance to picking. Figure 9 shows such a detainer 21a in combination with an arcuate slot 16A which further hinders operation with any instrument other than the correct key.

As a further alternative the detainers may be of circular cross-section with a groove instead of a slot for engagement with the locking ring when lifted to the operating position. Locking rings are then suitably formed for abutment with the cylindrical detainers. These detainers and corresponding slots in the plug are reduced in diameter along part of their length to prevent the removal of the detainers through the keyhole and to determine the amount of projection of each detainer into the keyhole. Each detainer may have a spherical radius at one end for co-operating with the indents in the key.

In an alternative embodiment of the invention the locking rings are constructed in a tubular form so that they are toroidal in shape with radial slots to receive the slidable detainers. The locking rings have projecting spigots projecting laterally to their planes and engaged in corresponding sockets in the lock case or cover plate.

The locking rings may be detachably mounted within the lock-case by for example extensions from the locking rings engaged in holes in the lock case and cover respectively. The extensions

and holes are constructed to prevent rotation of the locking-rings. The ring of arcuate flanges on one locking ring will be engaged in the circular recess in the plug thereby preventing detachment of the extensions on the other locking ring from the corresponding holes in the lock-case/cover. In such arrangement the segmental projection into the keyhole, described above on the cover plate, may be provided on the locking rings.

Referring to Figure 10 in a further arrangement the two locking rings are each formed as projections from respective halves 40 and 41 of a hollow cylinder. The projections 42 are similar to the ring of arcuate flanges in the above-described embodiment of the invention. The cylinder rotatably accommodates the plug and its cam, the latter having an extension passing through an opening in the wall of the cylinder to operate the bolt mechanism of the lock. The two halves are joined together after location of the plug. The unit so constructed may be housed and secured by screws, dowels, welding or adhesive in the lock casing to prevent independent movement or the unit may be used to operate an associated switch. The two halves of the cylinder have cylindrical bushes 43 extending from each end surface to define the entrance and exits to the keyhole. The segmental projection in the keyhole may be constructed as part of the walls of the cylinder or as a projection from the internal surface of one of the bushes 43.

It is intended that the engagement of the inward projection of the keyhole in the groove of the key shall prevent removal of the key from the mechanism in any position other than when the channel in the key is aligned to the inward projection of the keyhole. In another form of keyhole the inward projection is formed in the keyhole in the lock-case/cover plate while the keyhole in the plug has the form of the basically circular hole with a segmental projection.

It is intended to create various forms of keys and keyholes as a means of providing different combinations by repeating the combinations of detainer lifts in key-mechanisms having non-interchangeable forms of keyholes and keys.

In a further embodiment of the invention the key-mechanism is of the pin-tumbler type operated by a key of the type described above for use in the sliding detainer-type mechanism. In this further embodiment the locking-ring is cylindrical and has a central bore in which a plug is mounted for rotation. The locking-ring has radial bores angularly spaced and extending from the central bore to the outer surface of the locking-ring. The locking-ring is non-rotatably mounted within the lock-case. The plug is also cylindrical with a keyhole passing axially through it, the keyhole being formed to engage a key when entered from either end so that rotation of an appropriate key will effect rotation of the plug.

The plug also has radial bores extending from the keyhole to its outer surface, these bores being positioned for alignment with the corresponding bores in the locking-ring when said plug is located

in the axial bore in the locking-ring. The radial bores in the plug may have a reduced diameter along part of their length to define a shoulder abutment at a predetermined distance from the position of breakthrough into the key-hole. A spring and upper-pin or driver is assembled in each radial bore in the locking ring and a pin is located in each of the shouldered radial bores in the plug. The pins are narrower and wider portions of each pin rests normally on the shoulder in the radial bore to determine the protrusion of the pin into the keyhole and to prevent removal of the pin through the keyhole.

To retain the assembly of springs and pins in the locking ring and plug a ring may be fitted around the locking ring, alternatively each individual radial bore may be sealed by for example a small pin, or by indenting the locking ring around each of the radial bores. The spring in each radial bore in the locking-ring exerts a force on one end of each driver in the locking-ring, the drivers transmitting the force to the end of each respective pin in the plug and causing the other end of said pins in the plug to protrude into the keyhole.

In this locked position the driver is located across the surface of intersection between the plug and the locking-ring and thereby prevents rotation of the plug. The length of each driver and the length of each shouldered pin is variable but predetermined and corresponds to the depth of respective indents in the key. The difference between each set of pins in the mechanism and each corresponding depth of indent in the key thereby representing a differ. On the insertion of the appropriate key into the keyhole each shouldered pin is moved to a position according to the depth of the relative indent in the key. The shouldered pins in the plug correspondingly moving each driver against the pressure of its associated spring in the locking-ring so that the position of the interface between each pin in the plug and each corresponding driver in the locking ring is located on the surface of intersection between the locking ring in the plug. The plug may then be rotated by rotating the inserted key. When the key has been returned to the position in which it was inserted in the plug said key may be withdrawn so that under the pressure of the associated spring each driver and pin is urged inwards towards the key-hole in the plug.

Instead of using a shouldered pin in a stepped hole in the plug the pins in the plug may be prevented from removal from the plug by the shape of the keyhole.

In an alternative design the key may comprise a shank with radial splines to align with the position of the detainers in the mechanism, the alignment being achieved when the key is inserted from either side of the lock. The correct position of the key in the lock may be determined by the abutment of one or more of the splines, which are of greater length or of increased thickness than the others, against the lock-case, cover plate, plug or locking-ring. This abutment ensures that one set

of indents will co-operate with the appropriate detainers in the mechanism when the key is entered from one side of the lock while a further set of indents in the splines of the key will rotate in the keyhole in the door without the need for enlargement or alteration to the form of said keyhole. When the key is entered in the keyhole from the other side of the door the set of indents in the splines of the key which previously rotated in the keyhole in the door will co-operate with the respective detainers in the key mechanism while the indents in the key previously in co-operation with the detainers in the mechanism will rotate in the keyhole in the thickness of door again without the need for enlargement or alteration in the form of said keyhole.

In many of the types of mechanisms in accordance with the present invention the detainers or corresponding members in the key mechanism may form a single set or several sets. Alternatively the detainers may be positioned at various radial positions in relation to the central keyhole and at various positions in relation to the end of the key mechanism.

Claims

1. A key operated mechanism for a lock including a rotatable member (8) located within a lock casing (1) and having an axial keyhole and a plurality of groups of angularly-spaced transverse passageways (16) communicating with a keyhole and extending to the outer surface of the rotatable member (8), each passageway (16) containing a detaining member (21) biased towards the keyhole end of each passageway and arranged to slide along the passageway against the bias in response to the insertion and turning of a key in the keyhole thereof, a locking member (4) fixed to the casing (1) and being formed with a plurality of spaced projections (6) defining slots (7) therebetween located adjacent the passageways (16) in the rotatable member (8), the disposition of the passageways (16) corresponding with the disposition of the slots (7) in the locking members (4) such that when the rotatable member (8) is in a predetermined angular position the passageway (16) and slots (7) are in register, each detaining member (21) having slot (24) arranged to align with said projections (6) when the detaining member (21) is moved along the respective passageway (16) against the bias to a predetermined position such as to allow relative rotation between the rotatable member (8) and the locking member (4), and a key having two groups of indents (34a, 34b; 35a, 35b) axially spaced along the shank of the key, one of said groups being arranged to impart sliding movement to the detaining members against the bias when the key is inserted from one side of the mechanism and turned and the other group being arranged to impart sliding movement to the detaining members when the key is inserted from the other side of the mechanism and turned, characterised in that said detaining members are located wholly

within the respective passageways (16) in the rotatable member (8) and arranged therein such that removal therefrom cannot be effected without removal of the key mechanism from the casing, and the mechanism includes a pair of locking members (4) secured respectively to the inside surfaces of the casing (1) and a cover plate (2) therefor, the rotatable member being located and journaled between the two locking members.

2. A key-operated mechanism as claimed in claim 1 wherein a said locking member (4) includes a series of arcuate flanges (6) disposed in a ring and extending generally parallel to the keyhole, the spaces between the flanges providing said angularly spaced openings (7), and a series of said detainer members being (21) located in a circular configuration, each having a slot (24) for receiving said flanges (6), the slots (24) in the series of detainer members (21) being located in the ring of the arcuate flanges (6) when the detaining members (21) are moved each to its respective predetermined position, thereby allowing the rotatable member (8) and detaining members (21) to be rotated with respect to the locking member (4).

3. A key-operated mechanism as claimed in claim 2 wherein the detaining members (21) are arranged in two axially spaced circularly-configured series, the mechanism including two locking rings (4) with said arcuate flanges (6) each locking ring (4) co-operating with a respective series of said detaining members (21).

4. A key-operated mechanism as claimed in any one of the preceding claims wherein the keyhole of the mechanism, incorporating said keyhole of the rotatable member (8), is partially obstructed by a projection from the wall of the keyhole, and wherein the key has an abutment shoulder (31) adapted to abut the projection from the wall of the keyhole and limit the insertion of the key, the projection and shoulder being located such that when the key is entered from either side of the mechanism the shoulder abuts a respective side of said projection to locate the appropriate group of indents on the key with the detaining members in the mechanism.

5. A key-operated mechanism as claimed in claim 4 wherein the key includes a circumferential channel (33) forwardly adjacent said abutment shoulder and of width to accommodate said projection (9) from the wall of the keyhole to allow the key to rotate.

6. A key operated mechanism as claimed in claim 5 wherein the key has a flat surface (29) extending from the end to the channel (33), said abutment shoulder (31) being formed by a rib (30) extending from the channel (33) to the bow and said indents (34a, 34b; 35a, 35b) being provided with one group on either side of said channel, said cover plate (2) having a segmental projection (3) and said key being insertable from the cover plate side of said mechanism when the flat surface (29) of the key is flush with the upper surface of the segmental projection (3) in the cover plate

(2) and until the abutment shoulder (31) of the key abuts the outer surface of the cover plate (2) and the wall of the cover plate (2) is accommodated within said channel such that the key will rotate to ensure correspondence between one group of indents on one side of the channel and the detaining members (21), and said key being insertable from the lock casing side of the mechanism until the abutment shoulder (31) abuts the inside face of the segmental projection (3) when the said channel accommodates the wall of the cover plate (2) to allow the key to rotate with the other group of indents on the other side of the channel in register with the detaining members (21).

7. A key-operated mechanism as claimed in any one of the preceding claims, wherein at least part of the wall of the keyhole of the rotatable member (8) and the cross-section of the key along at least part of its length are so shaped that the key may be entered and withdrawn when in one angular disposition only, the shape of the keyhole and key engaging such that the rotatable member (8) is caused to rotate by rotation of the key.

8. A key as defined and adapted to form part of the mechanism as claimed in any one of claims 1 to 7.

Revendications

1. Mécanisme actionné par une clef pour une serrure comprenant un élément tournant (8) situé à l'intérieur d'un coffre de serrure (1) et doté d'une entrée de clef axiale et d'une pluralité de passages (16) transversaux espacés angulairement communiquant avec une entrée de clef et s'étendant vers la surface extérieure de l'élément tournant (8), chaque passage (16) contenant un élément de retenue (21) disposé en biais vers l'extrémité de chaque passage située à l'entrée de clef et étant disposé de manière à glisser le long du passage contre le biais en réponse à l'insertion et à la rotation d'une clef dans le trou de serrure, un élément de fermeture (4) fixé au coffre (1) et étant constitué d'une pluralité d'éléments espacés en saillie (6) définissant des fentes entre eux (7) situées dans le voisinage des passages (16) dans l'élément tournant (8), la disposition des passages (16) correspondant à la disposition des fentes (7) dans les éléments de fermeture (4) de sorte que lorsque l'élément tournant (8) se trouve en une position angulaire prédéterminée le passage (16) et les fentes (17) sont en registre, chaque élément de retenue (21) ayant une fente (24) disposée de manière à s'aligner sur lesdits éléments (6) en saillie lorsque l'élément de retenue (21) est déplacé le long du passage (16) respectif contre le biais de déviation vers une position prédéterminée de manière à permettre une rotation relative entre l'élément tournant (8) et l'élément de fermeture (4), et une clef ayant deux groupes d'encoches (34a, 34b; 35a, 35b) espacées axialement le long de la tige de la clef, un desdits groupes étant disposé de manière à communiquer un mouvement de glissement aux

éléments de retenue contre le biais de déviation lorsque la clef est insérée de l'extérieur d'un côté du mécanisme et tournée, et l'autre groupe étant disposé de manière à communiquer un mouvement de glissement aux éléments de retenue lorsque la clef est insérée de l'autre côté du mécanisme et tournée, caractérisé en ce que lesdits éléments de retenue sont situés entièrement endéans des passages (16) respectifs dans l'élément tournant (8) et disposés dans lesdits passages de manière que leur extraction ne puisse s'effectuer sans enlever le mécanisme de clef de son coffre, et le mécanisme comprend une paire d'éléments (4) de fermeture fixés respectivement aux surfaces intérieures du coffre (1) et une plaque de fermeture (2) destinée à cette fin, le membre tournant étant situé et tourillonné entre les deux éléments tournants.

2. Mécanisme actionné par une clef selon la revendication 1 caractérisé en ce qu'un dit élément de fermeture (4) comprend une série de flasques (6) en forme d'arc, disposés en rond et s'étendant généralement parallèlement à l'entrée de clef, les espaces entre les flasques assurant lesdites ouvertures (7) espacées angulairement, et une série desdits éléments de retenue (21) étant disposée selon une configuration circulaire, chaque éléments ayant une fente (24) pour recevoir lesdits flasques (6), les fentes (24) dans la série d'éléments de retenue (21) étant situées dans la configuration circulaire des flasques (6) en forme d'arc lorsque les éléments de retenue (21) sont déplacés chacun vers sa position prédéterminée respective, en permettant ainsi à l'élément tournant (8) et aux membres (21) de retenue un mouvement de rotation par rapport à l'élément (4) de fermeture.

3. Mécanisme actionné par une clef selon la revendication 2 caractérisé en ce que les éléments (21) de retenue sont disposés en deux séries à configuration circulaire exialement espacées, le mécanisme comprenant deux anneaux de fermeture (4) dotés desdits flasques (6) en forme d'arc, chaque anneau de fermeture (4) coopérant avec une série respective de dits éléments de fermeture (21).

4. Mécanisme actionné par une clef selon l'une quelconque des revendications précédentes caractérisé en ce que l'entrée de clef du mécanisme, incorporant ladite entrée de clef de l'élément tournant (8), est partiellement obstruée par une partie en saillie de la paroi de l'entrée de clef, et en ce que la clef est dotée d'une saillie (31) d'arrêt, conçue pour s'appuyer contre la partie en saillie de la paroi de l'entrée de clef et restreindre l'insertion de la clef, la partie en saillie et la saillie d'arrêt étant situées de telle sorte que lorsque la clef est insérée d'un côté ou de l'autre du mécanisme la saillie d'arrêt vienne s'appuyer contre un côté respectif de la partie en saillie de la paroi pour positionner le groupe approprié d'encoches sur la clef avec les éléments de retenue dans le mécanisme.

5. Mécanisme actionné par une clef selon la revendication 4, caractérisé en ce que la clef

comprend un canal (33) circonférentiel avoisinant ladite saillie d'arrêt et d'une largeur permettant le logement de ladite partie en saillie (9) de la paroi de l'entrée de clef pour permettre à la clef de tourner.

6. Mécanisme actionné par une clef selon la revendication 5, caractérisé en ce que la clef a une surface (29) plate s'étendant de l'extrémité du canal (33), ladite saillie d'arrêt (31) étant formée par une nervure (30) s'étendant du canal (33) vers l'anneau, et lesdites encoches (34a, 34b; 35a, 35b) étant dotées d'un groupe d'un côté ou de l'autre dudit canal, ladite plaque de couverture (2) ayant une partie (3) en saillie segmentaire, et ladite clef pouvant être insérée du côté plaque de couverture dudit mécanisme lorsque la surface (29) plate de la clef affleure la surface supérieure de la partie (3) en saillie segmentaire dans la plaque de couverture (2), et jusqu'à ce que la saillie d'arrêt de la clef vienne s'appuyer sur la surface extérieure de la plaque de couverture (2), et la paroi de la plaque (2) de couverture se loge dans ledit canal de telle sorte que la clef soit en mesure de tourner pour assurer la correspondance entre un groupe d'encoches d'un côté du canal et les éléments de retenue (21), et ladite clef pouvant être insérée du côté coffre de serrure du mécanisme jusqu'à ce que la saillie (31) d'arrêt vienne s'appuyer sur la face intérieure de la partie (3) en saillie segmentaire lorsque dans ledit canal il vienne se loger la paroi de la plaque (2) de couverture pour permettre à la clef de tourner avec l'autre groupe d'encoches de l'autre côté du canal en registre avec les éléments de retenue (21).

7. Mécanisme actionné par une clef selon l'une quelconque des revendications précédentes, caractérisé en ce qu'au moins une partie de la paroi de l'entrée de clef de l'élément tournant (8) et la coupe transversale de la clef le long d'au moins une partie de sa longueur sont conformées de telle sorte qu'il soit possible d'insérer et de retirer la clef lorsqu'une seule disposition angulaire se présente, la forme de l'entrée de clef et la clef insérée étant telles que l'élément tournant soit mis en rotation en faisant tourner la clef.

8. Clef telle que définie et conçue pour faire partie du mécanisme revendiqué selon l'une quelconque des revendications 1 à 7.

Patentansprüche

1. Schlüsselbetätigter Mechanismus für ein Schloß, enthaltend ein drehbares Glied (8), das in einem Schloßengehäuse (1) angeordnet ist und ein axiales Schlüsselloch sowie eine Mehrzahl von Gruppen von winkelversetzen, quer-verlaufenden, mit einem Schlüsselloch in Verbindung stehenden und sich bis zur Außenfläche des drehbaren Gliedes (8) erstreckenden Kanälen (16) aufweist, wobei jeder Kanal (16) ein Halteglied (21), enthält, das in Richtung auf das schlüssellochseitige Ende jedes Kanals vorbelastet ist und durch das Einführen und Drehen eines Schlüssels in seinem Schlüsselloch gegen

die Vorbelastung längs des Kanals verschiebbar ist; ein an dem Gehäuse (1) befestigtes Riegelglied (4), das mit einer Mehrzahl von im Abstand voneinander angeordneten Vorsprüngen (6) ausgebildet ist, welche dazwischen Schlitz (7) bilden, die angrenzend an die Kanäle (16) in dem drehbaren Glied (8) angeordnet sind, wobei die Anordnung der Kanäle (16) der Anordnung der Schlitz (7) in den Riegelgliedern (4) entspricht derart, daß, wenn das drehbare Glied (8) in einer vorgegebenen Winkellage ist, der Kanal (16) und Schlitz (7) fluchten, wobei jedes Halteglied (21) einen Schlitz (24) besitzt, der zu den Vorsprüngen (6) ausrichtbar ist, wenn das Halteglied (21) längs des jeweiligen Kanals (16) gegen die Vorbelastung in eine solche Stellung bewegt wird, daß es eine Relativdrehung zwischen dem drehbaren Glied (8) und dem Riegelglied (4) gestattet; und einen Schlüssel mit zwei Gruppen von Kerben (34a, 34b; 35a, 35b), die in axialem Abstand voneinander längs des Schaftes des Schlüssels angeordnet sind, wobei durch die eine dieser Gruppen den Haltegliedern eine Verschiebewegung gegen die Vorbelastung erteilbar ist, wenn der Schlüssel von einer Seite des Mechanismus eingeführt und gedreht wird, und durch die andere Gruppe den Haltegliedern eine Verschiebewegung erteilbar ist, wenn der Schlüssel von der anderen Seite des Mechanismus eingeführt und gedreht wird, dadurch gekennzeichnet, daß die Halteglieder vollständig innerhalb der jeweiligen Kanäle (16) in dem drehbaren Glied (8) untergebracht und darin so angeordnet sind, daß eine Entfernung daraus nicht bewirkt werden kann ohne Entfernung des Schlüsselmechanismus aus dem Gehäuse, und der Mechanismus ein Paar von Riegelgliedern (4) enthält, die jeweils an der Innenfläche des Gehäuses (1) und einer Deckplatte (2) für dieses befestigt sind, wobei das drehbare Glied zwischen den beiden Riegelgliedern angeordnet ist.

2. Schlüsselbetätigter Mechanismus nach Anspruch 1, dadurch gekennzeichnet, daß das Riegelglied (4) eine Reihe von bogenförmigen Flanschen (6) aufweist, die in einem Ring angeordnet und sich generell parallel zu dem Schlüsselloch erstrecken, wobei die Abstände zwischen den Flanschen die besagten winkelversetzen Öffnungen (7) bilden und eine Reihe der besagten Halteglieder (21) in dem Ring der bogenförmigen Flansche (6) angeordnet sind, wenn die Halteglieder (21) jedes in seine jeweilige vorgegebene Lage bewegt werden, wodurch das drehbare Glied (8) und die Halteglieder (21) gegenüber dem Riegelglied (4) verdrehbar sind.

3. Schlüsselbetätigter Mechanismus nach Anspruch 2, dadurch gekennzeichnet, daß die Halteglieder (21) in zwei axial versetzten kreisförmig-gestalteten Folgen angeordnet sind, wobei der Mechanismus zwei Riegelringe (4) mit den besagten bogenförmigen Flanschen (6) enthält und jeder Riegelring (4) jeweils mit einer Folge der besagten Halteglieder (21) zusammenwirkt.

4. Schlüsselbetätigter Mechanismus nach einem der vorhergehenden Ansprüche, bei

welchem das Schlüsselloch des Mechanismus, welches das Schlüsselloch des drehbaren Gliedes (8) mit umfaßt, teilweise durch einen Vorsprung von der Wandung des Schlüsselloches blockiert ist, und bei welchem der Schlüssel eine Anschlagsschulter (31), aufweist, die an den Vorsprung von der Wandung des Schlüsselloches anlegbar ist und die Einführung des Schlüssels begrenzt, wobei der Vorsprung und die Schulter so angeordnet sind, daß, wenn der Schlüssel von einer oder der anderen Seite des Mechanismus eingeführt wird, die Schulter an jeweils einer Seite des besagten Vorsprungs zur Anlage kommt, so daß die geeignete Gruppe von Kerben an dem Schlüssel bei den Haltegliedern in dem Mechanismus angeordnet wird.

5. Schlüsselbetätigter Mechanismus nach Anspruch 4, bei welchem der Schlüssel nach vorn angrenzend an die Anschlagsschulter eine Umfangsnut (33) von einer solchen Breite aufweist, daß sie den besagten Vorsprung (9) von der Wandung des Schlüsselloches aufnimmt und eine Drehung des Schlüssels gestattet.

6. Schlüsselbetätigter Mechanismus nach Anspruch 5, bei welcher der Schlüssel eine ebene Fläche (29) aufweist, die sich von dem Ende zu der Nut (33) erstreckt, wobei die besagte Anschlagsschulter (31) von einer Rippe (30) gebildet ist, die sich von der Nut (33) zu dem Schlüsselgriff erstreckt, und die besagten Kerben (34a, 34b; 35a, 35b) in je einer Gruppe auf jeder Seite der besagten Nut vorgesehen sind, und wobei die besagte Deckplatte (2) einen segmentären Vorsprung (3) besitzt und der Schlüssel von der Deckplatten- seite des Mechanismus her einführbar ist, wenn

die ebene Fläche (29) des Schlüssels in gleicher Ebene mit der oberen Fläche des segmentären Vorsprungs (3) in der Deckplatte (2) liegt und bis die Anschlagsschulter (31) des Schlüssels an der Außenfläche der Deckplatte (2) zur Anlage kommt und die Wandung der Deckplatte (2) innerhalb der besagten Nut aufgenommen wird, so daß der Schlüssel sich dreht und eine Übereinstimmung zwischen einer Gruppe von Kerben auf einer Seite der Nut und den Haltegliedern (21) sicherstellt, und wobei der Schlüssel von der Schloßgehäuse- seite des Mechanismus einführbar ist, bis die Anschlagsschulter (31) an der Innenfläche des segmentären Vorsprungs (3) zur Anlage kommt, wenn die Nut die Wandung der Deckplatte (2) aufnimmt, so daß der Schlüssel verdrehbar ist bei Fluchtung der anderen Gruppe von Kerben auf der anderen Seite der Nut mit den Haltegliedern (21).

7. Schlüsselbetätigter Mechanismus nach einem der vorhergehenden Ansprüche, bei welchem wenigstens ein Teil der Wandung des Schlüsselloches des drehbaren Gliedes (8) und der Querschnitt des Schlüssels längs wenigstens eines Teils seiner Länge so geformt sind, daß der Schlüssel nur eingeführt und herausgezogen werden kann, wenn er sich in einer Winkellage befindet, wobei die Form des Schlüsselloches und des Schlüssels so ineinandergreift, daß das drehbare Glied (8) durch Drehung des Schlüssels verdrehbar ist.

8. Schlüssel wie definiert und geeignet Teil des Mechanismus zu bilden wie beansprucht in einem der Ansprüche 1 bis 7.

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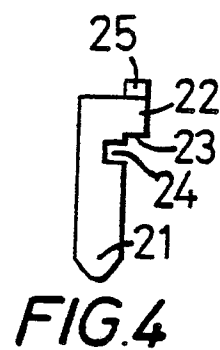
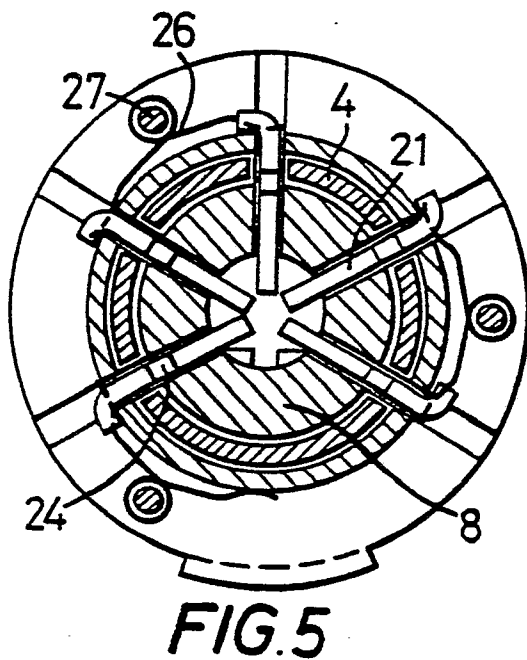
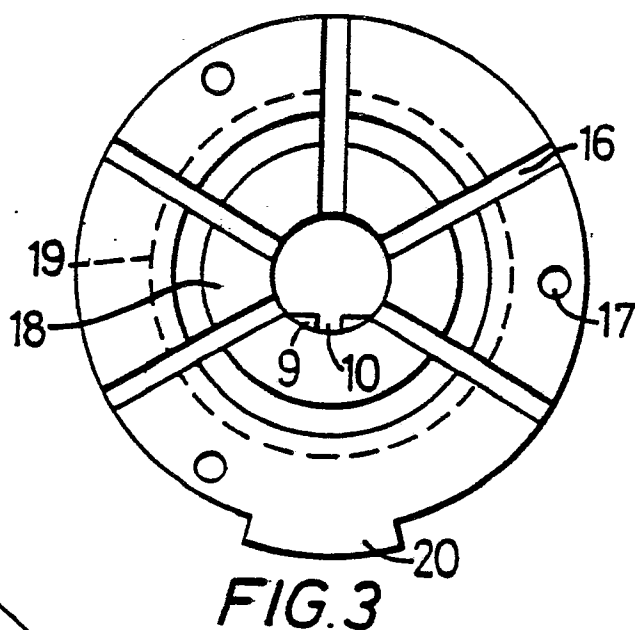
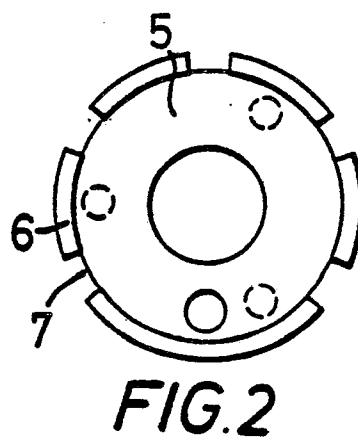
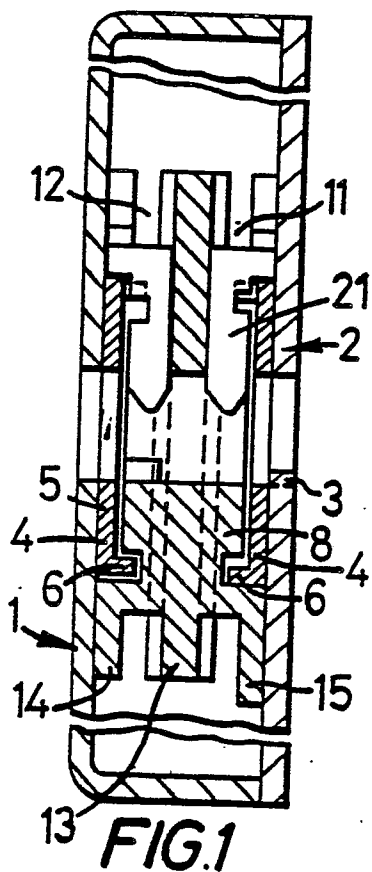
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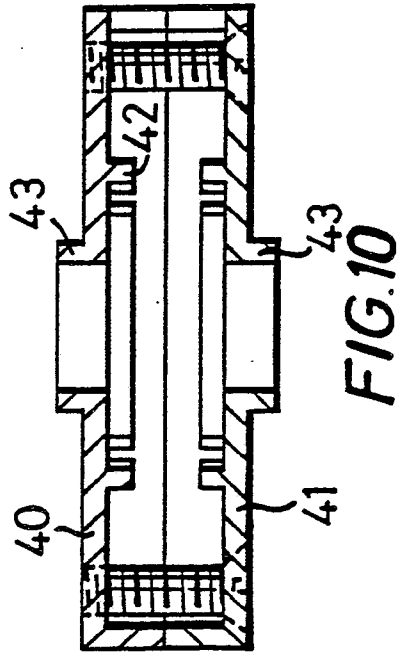
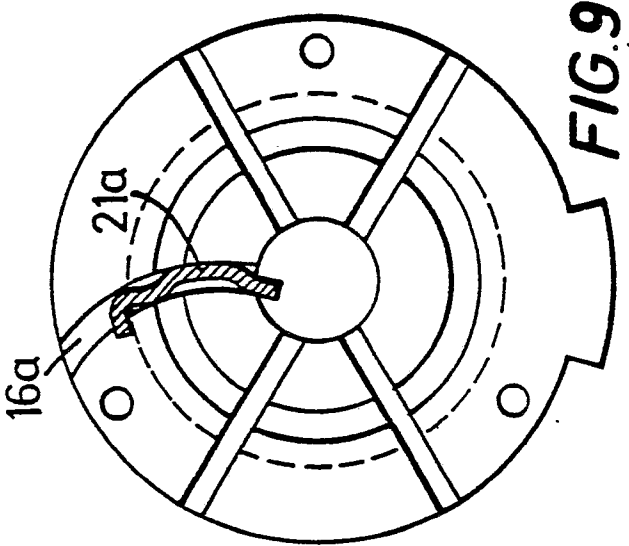
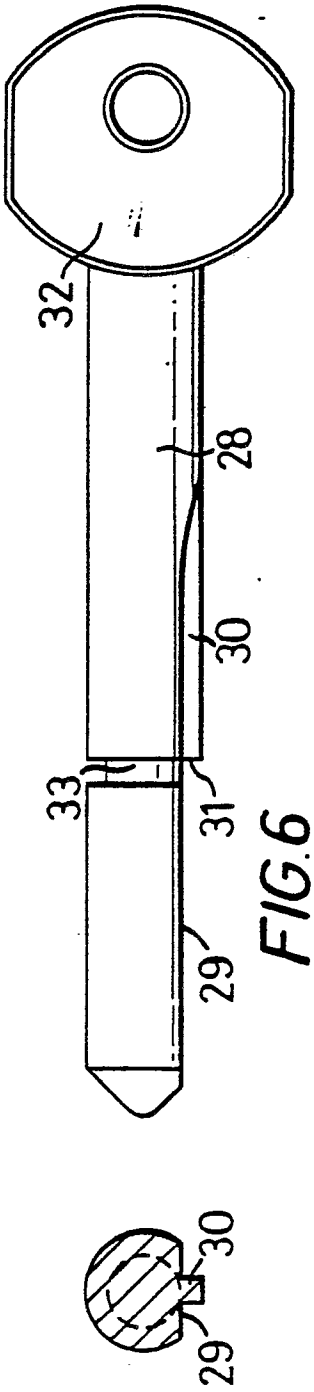
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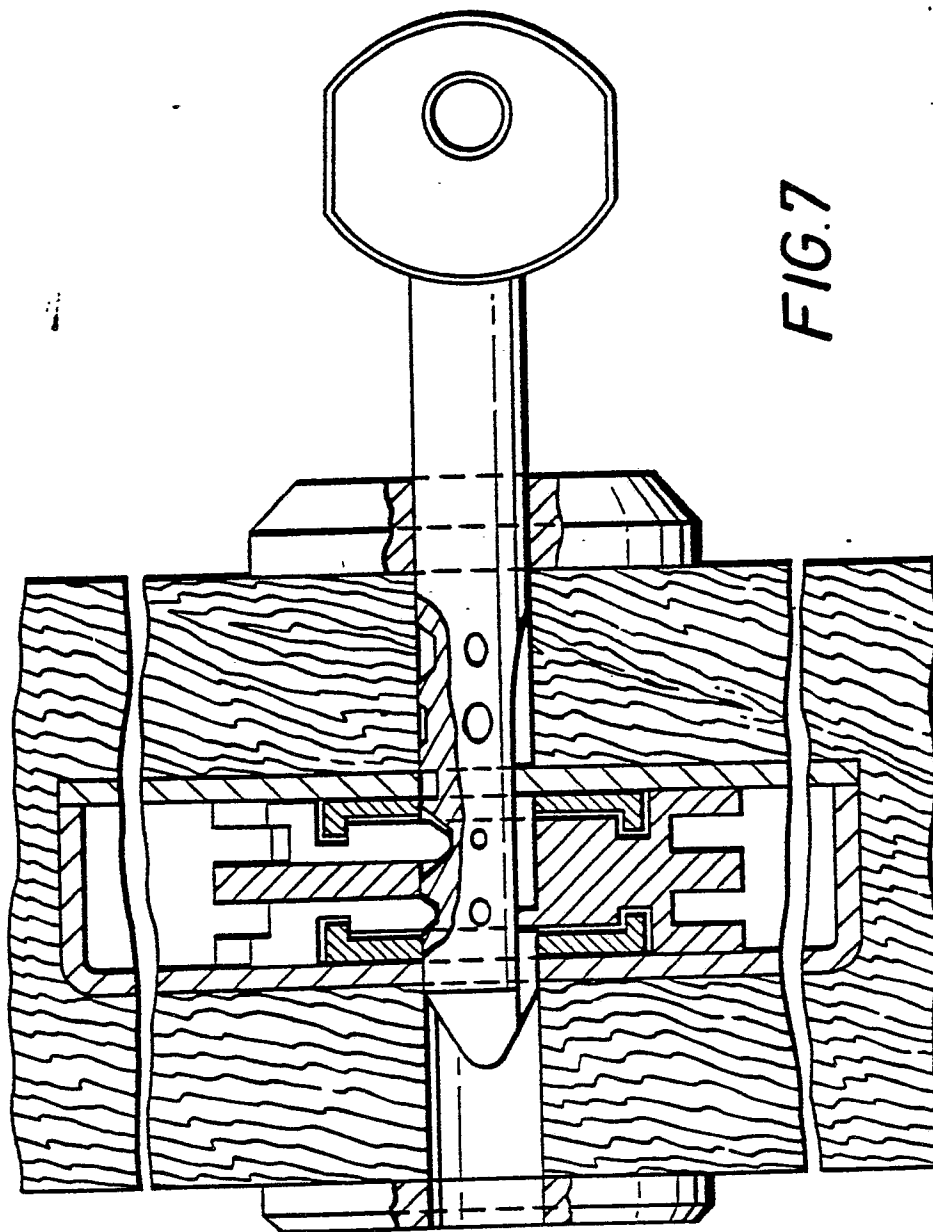


FIG. 7

