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Description

This invention relates to improvements in mortice latches.

The main problem with existing mortice latches is the wear which takes place between the latch bolt assembly and the latch bolt follower which results in inefficient operation of the latch bolt and eventually to total breakdown. The mortice latch must then be dismantled and the worn parts replaced or a new mortice latch must be fitted. Apart from the inconvenience of repairing or replacing a mortice latch, existing mortice latches occasionally break down when a door or the like to which they are fitted is in its closed position. Since the latch is normally located within the material of the door or the like to which it is fitted, it is not readily accessible and a locksmith must then be called in order to free the latch bolt from engagement in the door or like frame.

An attempt at solving this problem is disclosed in FR-A-772055 in which document a mortice latch has a casing and a latch bolt assembly reciprocally mounted in the casing and comprising a bolt head, a lathe and an end stop. A latch bolt follower is pivotally mounted in the casing and a rod 5 is pivotally connected at one end to the follower by a pivot pin 4 and slides at its other end through a die 6 which is also pivotally mounted in the casing. A coil spring 8 is mounted on the rod 5 and bears at one end against the die 6 and at the other end against a collar 9 on the rod 5. The purpose of this arrangement is to ensure that the forces exerted by the spring always act along its axis. However, the pivotal connection between the follower and the rod consists of a relatively thin pivot pin which is subject to wear and can be easily broken. Moreover, the pivot pin is not able to compensate for any wear of the lock components since as wear takes place, the pivot pin will become a sloppy fit in the bores in the follower and the end of the rod.

The present invention seeks to solve the above-mentioned problem by providing a mortice latch in which wear between the latch bolt assembly and the latch bolt follower is either substantially eliminated or largely compensated so that efficient operation of the mortice latch is assured for considerably longer periods of time than with the existing mortice latches.

According to the invention, there is provided a mortice latch having a casing; a latch bolt assembly reciprocally mounted in the casing and comprising a bolt head, a lathe and an end stop; a latch bolt follower, pivotally mounted in the casing; an elongate member engageable with the follower and a return spring arranged to act on the elongate member and, in turn, on the follower. The invention is characterised in that the follower has a socket in the form of a recess in the side of the follower, in that the elongate member is provided at one extreme end thereof with at least a part-cylindrical or part-spherical surface which is adapted to be received in and to engage with the socket in the follower and in that the recess is provided in the side of the follower facing the part-cylindrical or part-spherical surface.

Preferably, a further spring is provided which is arranged to act on the latch bolt assembly in such a manner that the assembly is biassed by the spring to a position in which the bolt head projects from the casing.

The return spring desirably takes the form of a coil spring mounted on the elongate member. One end of the elongate member is preferably spigoted into a roller which constitutes the said cylindrical surface and the other end of the elongate member preferably extends through an aperture provided in a projection extending from the wall of the casing. With this arrangement, the coil spring is desirably arranged to act at one end on said casing projection and, at the other end, on stop means provided on said elongate member.

It is also preferred for the follower to have a pair of arms extending from its pivot point on the casing, a first one of said arms being arranged to engage with the end stop of the latch bolt assembly and the socket being provided in the other arm. The surface of the said one arm of the follower which is engageable with the end stop is desirably arcuate. The end stop may also be provided with an arcuate surface for engagement by the arcuate surface of the follower.

The mortice latch according to the invention may also be provided with a dead bolt assembly arranged to be operated by a key. A number of levers or detainers arranged to be operated by the key are provided in order to free the dead bolt for operation and the or each lever or detainer is desirably provided with a spring which is engageable with a projection extending from the wall of the casing. This projection may be the same projection which is provided with an aperture for receiving the shaft of the follower member. The dead bolt preferably has a bolt head in which are located hardened steel dowel pins. Any number of levers or detainers may be provided although three or five are preferred as providing a reasonable compromise between cost of production and security.

The invention will now be further described, by way of example, with reference to the drawings, in which:-

Fig. 1 is a side elevation of one embodiment of a mortice latch incorporating a dead bolt action according to the invention with part of the casing removed to show the internal components;

Fig. 2 is a section taken on the line II-II in Fig. 1;

Fig. 3 is a section taken on the line III-III in Fig. 1.

Referring to the drawings, the mortice latch according to the invention comprises a casing consisting of a bottom case 1 and a top case 2. Secured to one side of the bottom case 1 by screws, rivets or the like (not shown) is an inner forend in the form of a plate 3 and secured to the inner forend again by screws, rivets or the like (not shown) is an outer forend in the form of a plate 4. Posts 5 and 6 are secured to the bottom case 1 and project upwardly therefrom, the posts being internally screw-threaded, and the top case 2 is provided with apertures which are aligned with the screw-threaded bores in the posts 5 and 6 whereby the top case can be detachably secured to the bottom case 1 by means of screws (not shown).

A latch bolt assembly comprising a bevelled bolt head 7, a bolt lathe 8 and a bolt end-stop 9 is reciprocally mounted in the casing, the bolt lathe 8 having a slot 11 which fits over the post 5 to limit movement of the latch bolt assembly with respect to the casing. In the position shown in the drawings, the latch bolt head 7 projects from the casing and passes through aligned slots in the forend plates 3 and 4. The latch bolt assembly is biassed into this position by a spring 13 which has an arm 14 which engages in a recess 12 provided in the rear surface of the latch bolt head 7. The mainbody of the spring 13 takes the form of a coil which is mounted on a post 16 projecting from the bottom case 1 and the spring has a second arm 15 which engages in a slot 18 provided in one limb of a strip 17 which also projects from the bottom case 1.

Pivotally mounted in circular apertures 21, 22 in the bottom and top cases 1 and 2 respectively is a latch bolt follower 23 having a square-sectioned bore 24 which is adapted to receive the correspondingly sectioned operating spindle of a door handle assembly (not shown). The follower 23 has a first curved arm 25 which extends from the pivot boss of the follower 23 and is provided at its end with an arcuate cam surface 26 which is arranged to engage with the latch bolt end stop 9. The follower arm 25 further has a substantially planar surface 27 on the side facing away from the cam surface 26 which bears against post 5 when the latch bolt assembly is in the position shown in the drawings.

Extending away from the pivot boss of the follower 23, in a direction substantially diametrically opposite to the arm 25, is a second curved arm 28 which is provided with a socket in the form of a cylindrical recess 29. A follower spring carrier drum in the form of a roller 31 is mounted for free pivoting action in the socket 29 and one end of an elongate member in the form of a follower spring carrier rod 32 is spigoted into the roller 31 so as to project from the follower arm 28. The other end of the rod 32 passes through an aperture 19 in the strip 17 projecting from the bottom case 1. A coil spring 33 is mounted on the rod 32, one end of the coil spring being arranged to bear against the strip 17 and the other end bearing against a stop ring 34 secured on the rod 32. The coil spring 33 and the spring 13 together combine forces to maintain the follower 23 and the latch bolt assembly in the position shown in the drawings. In this position, an end face of the arm 28 bears against the side of the cases 1 and 2.

If, when the mortice latch according to the invention is fitted in a door or the like and a handle assembly is fitted with a square-sectioned operating spindle extending through the bore 24, one of the handles is turned, the square-sectioned spindle will cause the follower 23 to rotate in a clockwise direction as viewed in Fig. 1. The cam surface 26 on the follower arm 25 will force the end stop 9 towards the right as viewed in Fig. 1. This movement will result in retraction of the whole latch bolt assembly into the casing thereby permitting the door or the like fitted with the mortice latch to be opened.

It will be appreciated that pivoting action of the follower 23 and sliding action of the latch bolt assembly by turning the handle takes place against the action of the springs 13 and 33 which are compressed. Therefore, when the handle is released, the spring 13 will act to return the latch bolt assembly and the spring 33 will act to return the follower 23 to the position shown in the drawings.

By virtue of the engagement of the arcuate surface 26 of the follower arm 25 on the latch bolt end stop 9, wear between the follower and the latch bolt assembly is largely eliminated because the engagement is mainly a rolling action. However, any wear that does take place is compensated for by the coil spring 33. The engagement of the roller 31 in the cylindrical socket 29 in the follower arm 28 assumes a ball and socket type action and is such that very little, if any, wear takes place between these components and any wear that does take place is fully compensated. The mortice latch according to the invention is therefore very reliable, subject to minimal wear and highly unlikely to break down or to require maintenance for a considerable period of time.

The mortice latch according to the invention may also be provided with a dead bolt assembly although this is not essential. One form of dead bolt assembly suitable for the mortice latch according to the invention is however shown in the drawings in which the assembly comprises a dead bolt head 41 and dead bolt lathe 42.

The lathe is provided with an elongated slot 43 in which a slide stump 44 projecting from the

bottom case 1 is located, the slot and stump cooperating to limit sliding movement of the dead bolt between a retracted position in which the dead bolt assembly is located wholly within the casing and an operative extended position shown in the drawings in which the dead bolt head 41 projects from the casing through aligned slots in the inner and outer forend plates 3 and 4.

A further slot 45 having inclined sides 46 is provided in the lower edge of the dead bolt lathe 42 for engagement by a bolt thrower 48 in a manner to be hereinafter described and a detainer talon 47 is mounted on and projects from the dead bolt lathe 42.

Mounted on a further post 51 projecting from the bottom case 1 are a series of detainers 52 which are separated by spacers 57. As shown in Fig. 2, there are five detainers but this is not essential and only three detainers could be provided if desired. As can be seen from Fig.1, each detainer 52 has a circular aperture by means of which the detainer can be installed on the post 51 and a spring 53 which is secured at one end in the detainer and is arranged to bear, adjacent its other end, against one end of the strip 17 projecting from the bottom case 1. Each detainer further has an arcuate recess 54 intended to be engaged by a key for the lock, a slot 55 adapted to accommodate the talon 47 and at least one tang 56 arranged to engage said talon 47. It should be noted that the arcuate recess 54, slots 55 and tangs 56 are differently arranged on the detainers and are adapted to cooperate with a key designed for the lock in the normal way. The spacers 57 located between the detainers ensure smooth operation and are provided with apertures for fitting over the post 51 and with slots similar to the slots 55 in the detainers for receiving the detainer talon 47.

The bolt thrower 48 is located on the bottom case 1 in the region of a key-hole shaped slot provided in said bottom case and a similar aligned key-hole shaped slot is provided in the top case 2 so that a key (not shown) can be inserted into the bolt thrower 48 from either side of the lock. Provided that the correct key has been inserted into the lock, turning of the key will ensure that the detainers 52 are first moved to a position in which the slots 55 are aligned with the talon 47. Further turning movement of the key will cause the bolt thrower 48 to engage in the slot 45 in the bolt lathe 42 to move the dead bolt. In the position shown in Fig.1 of the drawings, the dead bolt is in the locked condition so that the bolt thrower 48 must be rotated in a clockwise direction (as viewed in Fig.1) in order to move the bolt lathe 42 to the right to move the dead bolt assembly to the unlocked retracted position. The detainers are so designed that they engage the talon in this position of the dead bolt assembly. In order to return the dead bolt assembly to the locked position, the key must be turned in an anti-clockwise direction as viewed in Fig.1 whereupon the detainers are first moved clear of the talon 47 by the key and the bolt lathe 42 is then moved by engagement of the bolt thrower 48 in the slot 45. Once the dead bolt assembly has been moved to the locked position, the detainers will again engage the talon 47 to prevent movement of the dead bolt once the key has been taken out of the lock.

The bolt thrower 48 is desirably provided with a plate 49 having a notch 50 in its periphery in which a curved end 59 of one arm of a two-armed leaf spring 58 engages. The leaf spring is mounted on the post 6 and its other arm bears against the wall of the bottom case 1. By this means, the bolt thrower 48 is maintained in a postion in which it is aligned with the key-hole shaped slots in the cases 1 and 2 so that a key can easily be engaged in the lock.

The dead bolt head 41 may, if desired, be provided with hardened steel rollers 61 in a conventional manner for security purposes since such rollers prevent the dead bolt from being sawn through because the rollers rotate if an attempt is made to saw through the bolt.

It will be seen that the strip 17 projecting from the bottom case 1 constitutes a multiple spring stop against which bear all of the springs in the mortice latch according to the invention thereby providing a simplified and improved construction over the arrangements employed in existing locks.

The invention is not restricted to the above-described embodiment but modifications and variations may be made without departing from the scope of the invention. For example, the substantially planar surface on the latch bolt end stop 9 may be replaced by an arcuate surface. Although such a surface is not preferred because a planar surface is cheaper to produce than an arcuate surface, less wear will occur between two arcuate surfaces than between an arcuate surface and a planar surface and this alternative may be preferred for cases in which extremely reliable operation with miniumum maintenance are desired.

Further, although a bolt head has been shown in the drawings as having a substantially planar surface extending at an angle to the longitudinal axis of the latch bolt assembly, this surface may if desired take the form of a suitably curved bevelled surface. Moreover, it is not essential to provide the bolt thrower 48 and this component as well as the plate 49 and spring 58 may be omitted if desired.

Finally, it should be noted that the mortice latch according to the invention will still operate even in the event of failure or breakage of the spring 33 because of the positive engagement of

the latch bolt assembly by the follower.

Claims

1. A mortice latch having a casing (1); a latch bolt assembly reciprocally mounted in the casing and comprising a bolt head (7), a lathe (8) and an end stop (9); a latch bolt follower (23), pivotally mounted in the casing (1); an elongate member (32) engageable with the follower (23) and a return spring (33) arranged to act on the elongate member and, in turn, on the follower; characterised in that the follower (23) has a socket (29) in the form of a recess in the side of the follower, in that the elongate member (32) is provided at one extreme end thereof with at least a part-cylindrical or part-spherical surface which is engageable in the socket (29), and in that the recess is provided in the side of the follower facing the part-cylindrical or part-spherical surface.

2. A mortice latch according to claim 1, characterised in that a further spring (14) is provided which is arranged to act on the latch bolt assembly in such a manner that the assembly is biassed by the spring to a position in which the bolt head (7) projects from the casing (1).

3. A mortice latch according to claim 1 or claim 2, characterised in that the return spring takes the form of a coil spring (33) mounted on the elongate member (32).

4. A mortice latch according to any preceding claim, characterised in that one end of the elongate member (32) is spigoted into a roller (31) which constitutes the said cylindrical surface and the other end of the elongate member (32) extends through an aperture provided in a projection (17) extending from a wall of the casing (1).

5. A mortice latch according to claim 4, characterised in that one end of the return spring (33) is arranged to act on the casing projection (17) and the other end of the return spring is arranged to act on stop means (34) provided on the elongate member (32).

6. A mortice latch according to any preceding claim, characterised in that the follower (23) has a pair of arms (25, 28) extending from its pivot point on the casing (1), a first one (25) of said arms being arranged to engage with the end stop (9) of the latch bolt assembly and the socket (29) being provided in the other arm (28).

7. A mortice latch according to claim 6, characterised in that the surface (26) of the said one arm (25) of the follower (23) which is engageable with the end stop (9) is arcuate.

8. A mortice latch according to claim 7, characterised in that the end stop (9) is provided with an arcuate surface for engagement by the arcuate surface (26) of the follower (23).

9. A mortice latch according to any preceding claim and further comprising a dead bolt assembly (41, 42) arranged to be operated by a key.

10. A mortice latch according to claim 9, characterised in that the dead bolt assembly includes a number of levers or detainers (52) arranged to be operated by the key in order to free the dead bolt for operation, the or each lever or detainer (52) being provided with a spring (53) which is engageable with a projection extending from a wall of the casing (1).

11. A mortice latch according to claims 2 and 10, characterised in that one end of the said further spring (14) is arranged to bear against the latch bolt head (7) and the other end of the spring (14) is arranged to bear against the same projection (17) as that against which bear the spring(s) (53) of the lever(s) or detainer(s) (52).

12. A mortice latch according to claim 4 and claim 10 or claim 11, characterised in that the projection against which bear the spring(s) (53) of the lever(s) or detainer(s) (52) is the same projection (17) as the projection having an aperture through which extends the elongate member (32).

Patentansprüche

1. Einsteckschloß mit einem Gehäuse (1), einer Einschnappriegelanordnung, die in dem Gehäuse hin- und herbewegbar angeordnet ist und einen Riegelkopf (7), eine Dreheinrichtung (8) und einen Anschlag (9) umfaßt, mit einer in dem Gehäuse (1) schwenkbar angeordneten Einschnappriegelzuhaltung (23), mit einem länglichen Bauteil (32), das mit der Zuhaltung (23) in Eingriff bringbar ist, und mit einer zur Beaufschlagung des länglichen Bauteils und wiederum der Zuhaltung vorgesehenen Rückstellfeder (33), dadurch gekennzeichnet, daß die Zuhaltung (23) eine Lagerschale (29) in Form einer Ausnehmung in der Seite der Zuhaltung aufweist, daß das längliche Bauteil (32)

an einem seiner äußersten Enden mit einer zumindestens teilzylindrischen oder teilkugelförmigen Oberfläche versehen ist, die mit der Lagerschale (29) in Eingriff bringbar ist, und daß die Ausnehmung in der der teilzylindrischen oder teilkugelförmigen Oberfläche zugewandten Seite der Zuhaltung vorgesehen ist.

2. Einsteckschloß nach Anspruch 1, dadurch gekennzeichnet, daß eine weitere Feder (14) vorgesehen ist, die zur Beaufschlagung der Einschnappriegelanordnung derart angeordnet ist, daß die Anordnung von der Feder in eine Stellung verspannt wird, in der der Riegelkopf von dem Gehäuse vorspringt.

3. Einsteckschloß nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß die Rückstellfeder die Form einer an dem länglichen Bauteil (32) angeordneten Schraubenfeder (33) hat.

4. Einsteckschloß nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß ein Ende des länglichen Bauteils (32) mit einer die zylindrische Oberfläche bildenden Rolle (31) verbunden ist und das andere Ende des länglichen Bauteils (32) durch eine Öffnung hindurchreicht, die in einem von einer Wand des Gehäuses vorstehenden Vorsprung (17) vorgesehen ist.

5. Einsteckschloß nach Anspruch 4, dadurch gekennzeichnet, daß ein Ende der Rückstellfeder (33) zur Beaufschlagung des Gehäusevorsprungs (17) angeordnet ist und das andere Ende der Rückstellfeder zur Beaufschlagung einer an dem länglichen Bauteil (32) vorgesehenen Anschlagvorrichtung (34) angeordnet ist.

6. Einsteckschloß nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Zuhaltung (23) mit einem sich von ihrem Schwenkpunkt am Gehäuse (1) aus erstrekkenden Armpaar (25, 28) versehen ist, wobei von diesen Armen ein erster Arm (25) zum Eingreifen mit dem Anschlag (9) der Einschnappriegelanordnung angeordnet ist und wobei die Lagerschale (29) in dem anderen Arm (28) vorgesehen ist.

7. Einsteckschloß nach Anspruch 6, dadurch gekennzeichnet, daß die Oberfläche (26) dieses einen mit dem Anschlag (9) in Eingriff bringbaren Arms (25) der Zuhaltung (23) bogenförmig ist.

8. Einsteckschloß nach Anspruch 7, dadurch gekennzeichnet, daß der Anschlag (9) mit einer bogenförmigen Oberfläche zum Eingreifen mit der bogenförmigen Oberfläche (26) der Zuhaltung (23) versehen ist.

9. Einsteckschloß nach einem der vorhergehenden Ansprüche, weiterhin eine mit einem Schlüssel betätigbare Anordnung mit einem stehenden Riegel (41, 42) umfassend.

10. Einsteckschloß nach Anspruch 9, dadurch gekennzeichnet, daß die Anordnung mit dem stehenden Riegel eine Reihe von Hebeln oder Rückhaltern (52) einschließt, die durch den Schlüssel betätigbar sind, um den stehenden Riegel zur Bedienung freizusetzen, wobei der oder jeder Hebel oder Rückhalter (52) mit einer Feder (53) versehen ist, die mit einem sich von einer Wand des Gehäuses (1) erstreckenden Vorsprung in Eingriff bringbar ist.

11. Einsteckschloß nach den Ansprüchen 2 und 10, dadurch gekennzeichnet, daß ein Ende der weiteren Feder (14) zur Anlage gegen den Riegelkopf (7) angeordnet ist und das andere Ende der Feder (14) zur Anlage gegen denselben Vorsprung (17) vorgesehen ist wie der, gegen den die Feder(n) (53) des (der) Hebel(s) oder Rückhalter (52) anliegen.

12. Einsteckschloß nach Anspruch 4 und Anspruch 10 oder 11, dadurch gekennzeichnet, daß es sich bei dem Vorsprung, gegen den die Feder(n) (53) des (der) Hebel(s) oder Rückhalter (52) anliegen, um denselben Vorsprung (17) handelt wie den mit einer Öffnung versehenen Vorsprung, durch die sich das längliche Bauteil (32) erstreckt.

Revendications

1. Verrou encastré présentant un boîtier (1) ; une unité de pêne de verrou montée avec faculté de va-et-vient dans le boîtier et comprenant une tête de pêne (7), une queue de pêne (8) et un dispositif d'arrêt terminal (9); une gâchette de pêne de verrou (23), montée de manière pivotante dans le boîtier (1) ; un élément allongé (32) pouvant s'engager avec la gâchette (23) et un ressort de rappel (33) destiné à agir sur l'élément allongé puis sur la gâchette ; caractérisé en ce que la gâchette présente un logement (29) en forme d'évidement sur le côté de la gâchette, en ce que l'élément allongé (32) est disposé en une extrémité terminale de celle-ci et présente au moins une surface partiellement cylindrique ou partiellement

sphérique pouvant s'engager dans le logement (29), et en ce que l'évidement est disposé sur le côté de la gâchette faisant face à la surface partiellement cylindrique ou partiellement sphérique.

2. Verrou encastré selon la revendication 1, caractérisé en ce qu'un autre ressort (14) est fourni qui est destiné à agir sur l'unité de pêne de verrou de telle sorte que l'unité est chargée par le ressort jusqu'à une position dans laquelle la tête de pêne (7) fait saillie depuis le boîtier (1).

3. Verrou encastré selon la revendication 1 ou 2, caractérisé en ce que le ressort de rappel prend la forme d'un ressort à boudin (33) monté sur l'élément allongé (32).

4. Verrou encastré selon l'une des revendications précédentes, caractérisé en ce qu'une extrémité de l'élément allongé (32) est emboîtée dans un rouleau (31) qui constitue ladite surface cylindrique et l'autre extrémité de l'élément allongé (32) s'étend à travers une ouverture fournie dans une projection (17) s'étendant depuis une paroi du boîtier (1).

5. Verrou encastré selon la revendication 4, caractérisé en ce qu'une extrémité du ressort de rappel (33) est destinée à agir sur la projection du boîtier (17) et l'autre extrémité du ressort de rappel est destinée à agir sur des moyens d'arrêt (34) disposés sur l'élément allongé (32).

6. Verrou encastré selon l'une des revendications précédentes, caractérisé en ce que la gâchette (23) présente une paire de bras (25, 28) s'étendant depuis son point de pivot sur le boîtier (1), le premier (25) desdits bras étant destiné à s'engager avec le dispositif d'arrêt terminal (9) de l'unité de pêne de verrou et le logement (29) étant disposé sur l'autre bras (28).

7. Verrou encastré selon la revendication 6, caractérisé en ce que la surface (26) dudit premier bras (25) de la gâchette (23) qui peut s'engager avec le dispositif d'arrêt terminal (9) est arquée.

8. Verrou encastré selon la revendication 7, caractérisé en ce que le dispositif d'arrêt terminal (9) est muni d'une surface arquée destinée à s'engager avec la surface arquée (26) de la gâchette (23).

9. Verrou encastré selon l'une des revendications précédentes, comprenant également une unité de pêne dormant (41, 42) destinée à être actionnée par une clé.

10. Verrou encastré selon la revendication 9, caractérisé en ce que l'unité de pêne dormant inclut plusieurs leviers ou moyens de retenue (52) destinés à être actionnés par la clé de manière à libérer le pêne dormant pour actionnement, le ou chaque levier ou moyen de retenue (52) étant muni d'un ressort (53) qui peut s'engager avec une projection s'étendant depuis une paroi du boîtier (1).

11. Verrou encastré selon les revendications 2 et 10, caractérisé en ce qu'une extrémité dudit ressort supplémentaire (14) est destinée à reposer contre la tête de pêne de verrou (7) et l'autre extrémité du ressort (14) est destinée à reposer contre la même projection (17) que celle contre laquelle repose le(s) ressort(s) (53) du ou des levier(s) ou moyen(s) de retenue (52).

12. Verrou encastré selon les revendications 4 et 10 ou 11, caractérisé en ce que la projection contre laquelle repose le(s) ressort(s) (53) du ou des levier(s) ou moyen(s) de retenue (52) est la même projection (17) que la projection présentant une ouverture à travers laquelle s'étend l'élément allongé.

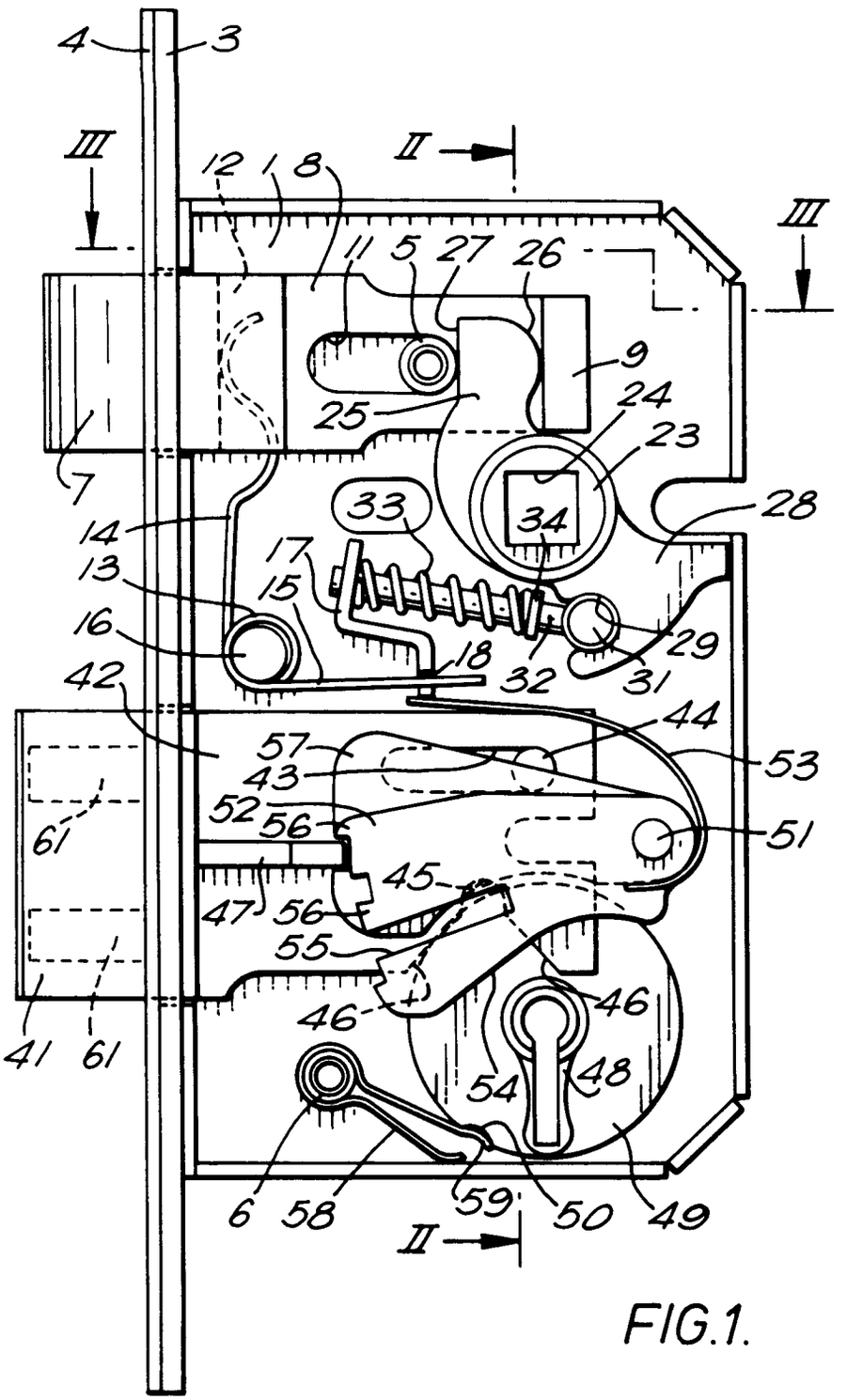

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FIG.1.

FIG. 2.

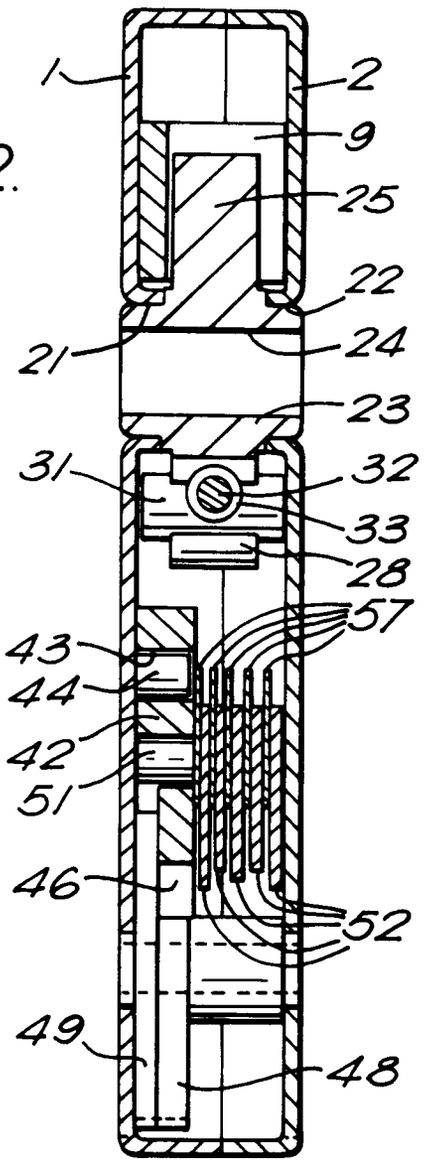
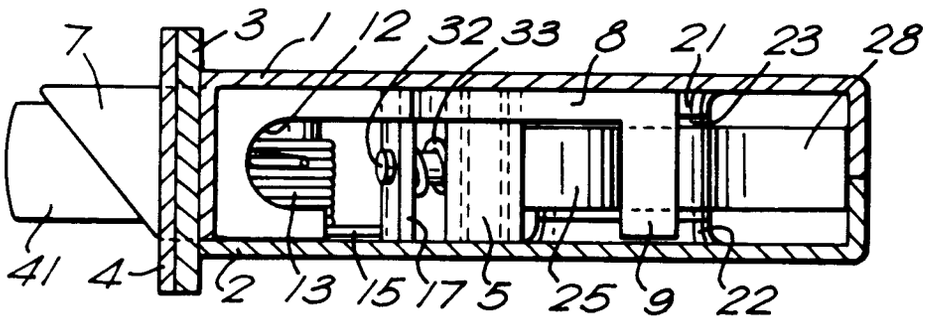

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FIG. 3.


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