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DESCRIPTION OF INVENTION

A rotary lock for releasably connecting corner fittings of containers stacked one upon the other

THIS INVENTION relates to a rotary lock comprising a locking pin axially rotatable in a housing and comprising a shank, at each end of which a transverse latch is secured, and which is subject to the action of a hand lever, the rotary lock being adapted to be brought basically into three positions relatively to the corner fittings of containers for the purpose of releasably connecting two containers one upon the other, said three positions being the locking position of one transverse latch, of the other transverse latch, or both transverse latches.

Rotary locks of this kind are used particularly to secure containers stacked one upon the other from slipping relatively to one another during transportation, as on a ship, in a truck or by rail. For this purpose, a container has at each corner a fitting into each of which a transverse latch can be introduced through a slot in order to be brought into its locking position to engage beneath the associated corner fitting. The second transverse latch of the rotary lock is then introduced into a corner fitting of an adjacent container disposed above or beneath the same and locked correspondingly. Locking and unlocking are preferably effected during loading on to and unloading from the corresponding means of transport.

A rotary lock of the kind according to the preamble is already known from DE 36 42 399 A1, wherein to couple two containers the following three positions are traversed



successively: a pre-locking starting position, in which the top transverse latch is in an open position for engagement in a corner fitting of the top container, a pre-locking middle position in which the bottom transverse latch is in an opened position, while the top transverse latch is pre-locked, and an end locking position in which both transverse latches are locked. For locking purposes, the rotary lock is first introduced by its top transverse latch into the slot of the bottom corner fitting of the top container, whereupon the hand lever is pivoted to produce the pre-locking middle position. The top container with the rotary lock, the bottom transverse latch of which in the pre-locked position is in the unlocked position, is then placed on the bottom container. A force storage means, which comprises at least one spring, is actuated by an actuating member which, when the two containers are driven together, is pressed into the rotary lock housing and thus prestresses the force storage means until the bottom transverse latch in its unlocked position is mounted in the corner fitting of the bottom container and then, by at least partial expansion of the force storage means, passes automatically into its locked position. A return means is also connected to the actuating member and by means of at least one other spring actuates the actuating member to effect unlocking when the hand lever is moved accordingly. Unfortunately, at least one additional spring is provided for temporarily locking the rotary locks in their locking positions. One disadvantage in particular is the very complicated construction of this embodiment of a rotary lock, which comprises a plurality of springs and in which locking of the top and bottom transverse latches takes place differently, i.e. with a different mechanism, thus accurately predetermining which transverse latch must first be brought into its locking position.



DE 37 10 419 A1 also discloses a rotary lock for releasably connecting corner fittings of adjacent containers comprising a housing and a locking pin mounted therein having at its two ends opposite transverse latches. In the basic position of the rotary lock, the top transverse latch is in its locked position and the bottom transverse latch in its unlocked position. The connection between the two containers is made as follows: firstly, the top transverse latch is rotated against the force of a tension spring until it fits in the slot of the corner fitting of the top container, and then pushed into the slot. The locking pin is then automatically brought into a pre-locking position by partial expansion of the tension spring, this pre-locking position corresponding to the basic position. A hand lever engaging the locking pin is then actuated against the force of a torsion spring to bring the rotary lock into a locking position so that the top transverse latch engages well beneath the top corner fitting and the bottom transverse latch is not in register with the slot of the corner fitting of the bottom container. When the top container is lowered on to the bottom container the bottom transverse latch turns against the tension spring prestressing. As soon as the top container has been fully lowered on to the bottom container, the tension spring ensures that the locking position is again reached so that a transverse latch engages beneath a corner fitting. To unlock the rotary lock, the hand lever has to be unlocked manually, the torsion spring again being used. The mechanism of this rotary locking system, which requires at least two springs, is fairly complicated and requires an expensive construction in which again it is exactly predetermined which transverse latch must be locked first.

Also, DE 38 09 834 A1 discloses a similar rotary lock. In this, the top transverse latch is first brought into the



top container corner fitting slot after unlocking by means of the hand lever, the latter then being actuated to produce a locking position in which a compression spring is operative to ensure that the top transverse latch engages beneath the corner fitting of the top container. In the next step, the top container is moved towards the bottom container so that the bottom transverse latch can be rotated into the slot of the corner fitting of the bottom container. As soon as the bottom transverse latch has completely rotated into the slot, it returns to its starting position in response to a coil spring, so that each transverse latch engages beneath the associated corner fitting. Unlocking is again obtained by reversing the hand lever. Again the very complicated structure and expensive mechanism requiring at least two springs are a disadvantage. Once again the locking of the two transverse latches differ from one another so that during locking care must always be taken to see which transverse lock must be locked first.

The object of the invention therefore is to provide a rotary lock of the type referred to in the preamble, of simple and inexpensive construction and which, in particular, requires only one spring. Another object is so to devise the two transverse latches and their connections to the other elements of the rotary lock that it is immaterial which of the two transverse latches is first locked or unlocked.

To solve this problem, the rotary lock according to the invention is characterised in that only one spring means is required which is connected on the one hand to the hand lever and on the other hand to the locking pin, and the housing comprises a locking means to lock the hand lever and hence the locking pin in positions corresponding to the



said three positions of the transverse latches, that position in which the two transverse latches are in their locking position being the basic position of the rotary lock and any rotation of the locking pin out of this position, irrespectively of whether to the left or right, so takes place against the force of the spring means that energy can be stored in the spring means for subsequent automatic locking.

Preferably according to the invention, the housing consists of two identical halves secured to one another in a 180° relatively rotated position perpendicularly to the longitudinal axis of the rotary lock, the longitudinal axis being identical to the axis of rotation of the locking pin.

According to the invention, the two transverse latches may be of identical formation, have substantially rectangular sections preferably formed from hexagons with rounded edges, which taper conically away from the shank to form an entry guide for the purpose of independent rotation into a slot of a corner fitting of a container, and are so connected to other elements of the rotary lock via the locking pin that they can be locked and unlocked on the same principle.

One preferred exemplified embodiment of the invention is characterised in that the hand lever and the transverse latches extend perpendicularly to the axis of rotation of the shank, one transverse latch extending exactly the same amount rotated to the left as the other transverse latch rotated to the right with respect to the hand lever.

The invention also proposes that the two transverse latches are disposed turned through approximately 46 to 60°



preferably 50 to 56° relatively to one another about the axis of rotation of the shank.

According to another feature of the invention the housing may comprise a shell surrounding the shank of the locking pin and, in the middle, between the two transverse latches, a middle part which serves as a spacer means between two stacked containers and comprises the locking means, the hand lever being so disposed relatively to the middle part that it can be engaged with the locking means.

Preferably, according to the invention the pivotable hand lever at least partially traverses the middle part in a passage.

The invention also proposes according to another feature that the hand lever has at one end a handle projecting from the housing, its other end is connected to the spring means and it comprises at least one sliding pin which extends from the hand lever parallel to the axis of rotation of the shank between the spring means and the handle, preferably two sliding pins being provided, of which one extends in the direction of one transverse latch and the other in the direction of the other transverse latch.

If required the handle of the hand lever may be formed parallel to the axis of rotation of the shank.

According to another proposal the hand lever comprises means for securing it against rotation between the spring means and the or each sliding pin in order to secure it against turning inside the middle part.



According to another proposal of the invention the spring means may be a compression spring which at least partially surrounds the hand lever concentrically.

According to the invention, if required, the locking pin has in the region of the middle part of the housing a middle portion having a recess to accommodate part of the hand lever and the compression spring, the recess comprising a shoulder which serves to limit the expansion of the compression spring and provides a positive connection between the compression spring and the locking pin.

Alternatively, according to another proposal of the invention, the spring means is a tension spring which is connected non-positively both to one end of the hand lever and to the locking pin.

According to another proposal of the invention the locking pin has in the region of the middle part of the housing a middle portion on which a connecting element is disposed to fix the tension spring.

Preferably, according to the invention, to form the locking means the middle part is formed, on the side facing the handle of the hand lever, with an edge of substantially V-shaped cross-section with three locking recesses to accommodate a sliding pin of the hand lever, the first locking means for securing the basic position of the rotary lock being disposed in the middle between the two limbs of the V shape, the second locking recess for securing the locking position of just the top transverse latch being disposed in the left-hand limb of the V shape when viewed from beneath looking towards the middle part, and the third locking recess for securing the locking position of just



the bottom transverse latch being disposed in the right-hand limb of the V shape when viewed from beneath looking towards the middle part.

According to another proposal of the invention at the two opposite edges facing the handle and enclosing the hand lever the middle part has a substantially V-shaped cross-section with in each case three aligned locking recesses in such manner that a sliding pin of the hand lever rests in each case on a V-shaped edge and can be brought into a locking recess.

According to another proposal the two limbs of the edge of substantially V-shaped cross-section are bent perpendicularly to the axis of rotation of the shank, the radius of curvature being positive or negative optionally for each limb.

Preferably, according to the invention, in the basic position of the rotary lock, the hand lever is so disposed as to extend along the line connecting the two housing halves in the middle of the middle part, contacts a sliding pin in a first locking recess, the top transverse latch extends turned through 23 to 30°, preferably 25 to 28°, to the left relatively to the connecting line and the bottom transverse latch correspondingly extends rotated through 23 to 30°, preferably 25 to 28°, to the right relatively to the connecting line when viewed from beneath looking at the transverse latches.

Finally, according to the invention, a sliding pin is adapted to slide from the first locking recess along the corresponding V-shaped edge against the force of the spring means in the direction of the second locking recess or in the direction of the third locking recess in such manner



that the hand lever is disposed with its end having the handle further away from the axis of rotation of the shank than in the basic position, whereby energy can be stored in the spring means.

The invention is based on the surprising finding that only one spring means between a hand lever and a shank of the locking pin in co-operation with at least one sliding pin of the hand lever adapted to slide on a substantially V-shaped edge having three locking recesses is sufficient, after one transverse latch has been rotated, whether the top or bottom latch, into a corner fitting slot on a container, to make available sufficient energy for automatic locking, i.e. turning back, of this transverse latch and ensure locking of the rotary lock, with just one of the two transverse latches or both transverse latches locked.

The rotary lock according to the invention is thus advantageously distinguished by the fact that it has a very simple construction requiring just one spring means. Also, the number of individual parts of the rotary lock and tool costs in production are reduced by the fact that the housing consists of two identical halves.

Handling of the rotary lock according to the invention is greatly improved compared with conventional rotary locks, since the automatic turning back and locking of each of the two transverse latches takes place identically and it is thus immaterial which transverse latch is first locked. Unlocking by means of the hand lever is also equivalent for both transverse latches.

In addition, the rotary lock according to the invention can be used equivalently either as a semi-automatic or as a



conventional rotary lock, the term "semi-automatic" meaning that automatic locking takes place when used while unlocking takes place manually. Thus the decision as to how a means of transport is to be unloaded, i.e. conventionally or by sequence of operations applied when using semi-automatic rotary locks, is independent of the loading method, i.e. conventional or semi-automatic.

Other features and advantages of the invention will be apparent from the following description which explains in detail one exemplified embodiment of the invention with reference to the diagrammatic drawing wherein:

Fig. 1a is a side elevation of a rotary lock according to the invention in its basic position.

Fig. 1b is a bottom view of the rotary lock shown in Fig. 1a.

Fig. 2a is a side elevation of just the locking pin of the rotary lock shown in Fig. 1a.

Fig. 2b is a section on the line A-A in Fig. 2a.

Fig. 2c is a section on the line B-B in Fig. 2a.

Fig. 2d is a plan view of a transverse latch.

Fig. 3a is a side elevation of the rotary lock shown in Fig. 1a on insertion of a transverse latch into the corner fitting of a container.

Fig. 3b is a bottom view of the rotary lock shown in Fig. 3a.



Fig. 4 is a side elevation of a rotary lock according to the invention locked between two container corner fittings and having a pull-open fitting, and

Fig. 5 is a side elevation of the rotary lock of Fig. 4 after unlocking of one of the two transverse latches.

As will be apparent from Figs. 1a and 1b, the rotary lock according to the invention comprises a locking pin 10 which extends at least partially through a housing 20, 20' and is connected to a hand lever 30.

As will be apparent from Fig. 2a, the locking pin 10 consists of a shank 11, at each end of which is disposed a transverse latch 12, 12' and the centre of which consists of a middle portion 14. Discs 15, 15' are provided between the shank 11 and each transverse latch 12, 12' to rest on a housing shell 21, see Fig. 1a for example. Figs. 2b and 2c are each cross-sections on the line A-A and B-B of Fig. 2 to illustrate that the shank 11, the middle portion 14 and the discs 15, 15' each have a circular cross-section, while that of the transverse latches 12, 12' is substantially rectangular. The substantially rectangular cross-sections consist of hexagons with rounded edges which taper conically away from the shank 11 to form an entry guide 13, 13', see Fig. 2d. It will be apparent from the cross-section shown in Fig. 2c that the middle portion 14 has a recess 16 with a shoulder 17, the recess 16 serving to accommodate the hand lever 30, as will be described hereinafter.

The shank 11 is mounted for rotation in the housing 20, 20' about the line shown in broken form in Fig. 2a from X to Y, one transverse latch 12 being turned relatively to the other transverse latch 12' through 52° about its axis of



rotation, i.e., the top transverse latch 12 is turned anticlockwise through 26° and the bottom transverse latch 12' is turned clockwise with respect to the axis of rotation of the shank 11 through 26° , looking from below on to the transverse latches 12, 12' in the basic position.

The housing itself consists of two identical halves 20, 20' which are secured to one another in opposed relationship by means of screws 28, 28'. The housing 20, 20' thus formed encloses the housing shell 21 which surrounds the shank 11 and which in the region of the middle portion 14 has a middle part 22, the geometric shape of which can be seen, for example, from Fig. 1b. The middle part 22 has a substantially V-shaped edge in cross-section, formed by two bevelled edges 23, 23' of the two housing halves 20, 20'. To enable the hand lever 30 to be pivoted, said hand lever being disposed perpendicularly to the axis of rotation of the shank 11 in the middle part 22, it has passages 27, 27' formed by recesses in the two housing halves 20, 20' and extending from the edge 23, 23' having the V-shaped cross-section to the edge opposite the same. The housing halves 20, 20' also have some recesses to reduce the weight, although this is not discussed hereinafter.

The hand lever 30 in turn has means 31 to prevent its being turned, two opposite sliding pins 32, 32' extending parallel to the axis of rotation of the shank 11, and a handle 35 at one end. A compression spring 33 is secured by means of a screw 34 on that end of the hand lever 30 which is remote from the handle 35 and surrounds the hand lever 30 in spiral form and at least partially concentrically. The expansion of the compression spring 33 along the hand lever 30 is limited, on the one hand, by the screw 34 and, on the other hand, by the shoulder 17 in the recess 16, through which the hand lever 30 extends to



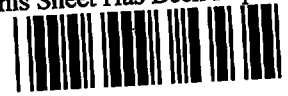
establish connection with the locking pin 10. Each of the sliding pins 32, 32' can slide along an edge 23, 23' of V-shaped cross-section of the housing 20, 20' and be inserted in one of the three locking recesses 24, 24', 25, 25', 26, 26' shown. In the basic position of the rotary lock, the hand lever 30 extends parallel to the line connecting the two housing halves 20, 20' through the middle of the middle part 22 and the passages 27, 27'.

The rotary lock according to the invention, the construction of which has been described above, is used as follows to secure two containers relatively to one another:

Each container has corner fittings 40, 40' each having a slot 41, 41' leading into an interior 42, 42', as will be apparent from Figs. 3a, 4 and 5.

The semi-automatic locking system will first be described:

As shown in Fig. 3a, the rotary lock according to the invention is gripped by the hand 50 at one of the transverse latches 12' and turned in order to rotate the other transverse latch 12 into the slot 41 of the corner fitting 40 of a container. When the other transverse latch 12 is turned into the slot 41, it must be rotated from its locked position, as shown in Fig. 1a, into its unlocked position, see Fig. 3a. In these conditions, the hand lever 30, viewed from beneath, moves to the right out of the basic position shown in Figs. 3a and 3b. At the same time, the sliding pins 32, 32' slide from the first locking recess 24, 24' along the inclined plane of the V-shaped edge 23 upwards to the right, in the direction of the second locking recess 25, 25'. As a result of the sliding pins 32, 32' moving up along the edge 23, the hand lever 30 moves with its end having the handle 35 away from the axis



of rotation of the shank 11, so that the distance between the screw 34 and the shoulder 17 is reduced. This results in the compression spring 33 being compressed and hence energy stored.

As soon as the other transverse latch 12 has completely passed through the slot 41 and is situated in the interior 42, it automatically turns back to its locking position in response to the force of the compression spring 33, this locking position being identical to the basic position, as shown in Fig. 1a. In these conditions, the container edge 70 (maximum), 70' (minimum) extends so far that the handle 35 is still satisfactorily accessible, see Fig. 3b.

In the next step, one container with the rotary lock is moved towards another container on to which it is to be placed, so that one transverse latch 12' contacts a slot 41' of a corner fitting 40' of this bottom container. As a result of its geometric configuration in the form of a cone, the bottom transverse latch 12' now turns automatically into the bottom slot 41' against the force of the compression spring 33. In these conditions, the hand lever 30 is moved, from its position of rest in which the sliding pins 32, 32' rest on the first locking recesses 24, 24', to the left, as considered from beneath, in the direction of the third locking recesses 26, 26'. Again there is a shortening of the distance between the screw 34 and the shoulder 17 and hence a contraction of the compression spring 33. As soon as the bottom transverse latch 12' has entered the interior 42' of the bottom corner fitting 40', it rotates and thus turns the complete locking pin 10, as a result of at least partial expansion of the compression spring 33, back into its locking position as shown in Fig. 4. Each transverse latch 12, 12' now engages beneath a corresponding corner fitting 40, 40', the middle



part 22 acting as a spacer means between the two corner fittings 40, 40', i.e. containers.

To unlock the rotary lock thus locked, a pull-open fitting 60 can be so placed around the hand lever 30, i.e. the handle 35, that the hand lever 30 can, with its aid, be moved either to the left, viewed from beneath, to release the locking of the bottom transverse latch 12', or to the right, viewed from beneath, to release the locking of the top transverse latch 12. Fig. 5 shows the situation in which the hand lever 30 has been moved to such an extent to the left, viewed from beneath, until its sliding pins 32, 32' engage in the third locking recesses 26, 26' to secure the bottom transverse latch 12' in the unlocked position. The top container together with the rotary lock can then be driven off so that finally the top transverse latch 12 can be removed by repositioning the hand lever 30.

The conventional securing of containers will now be described:

In this case, the rotary lock is first turned into the corner fitting of the bottom container by one of the two transverse latches 12'. To lock the transverse latch 12' which is thus at the bottom, the hand lever 30 is pushed to the right, viewed from beneath, until its sliding pins 32, 32' engage in the second locking recesses 25, 25'. Thus the bottom transverse latch 12' is in its locked position and the top transverse latch 12 is in its unlocked position.

In the next step, a second container is placed from above on the bottom container, the top transverse latch 12 in its unlocked position being pushed into the corresponding slot of the corner fitting of the upper container. To lock the



two transverse latches 12, 12', the hand lever 30 is again brought to its original position, in which the sliding pins 32, 32' engage in the first locking recess 24, 24'.

For unlocking purposes, the hand lever 30 is again moved to the right, viewed from beneath, to an extent such that its two sliding pins 32, 32' pass from the first locking recesses 24, 24' into the second locking recesses 25, 25' and the upper container can again be removed without difficulty.

The rotary lock can be removed from the bottom container if the hand lever 30 is moved to the left, viewed from beneath, until its two sliding pins 32, 32' engage in the third locking recesses 26, 26'.

Other exemplified embodiments operating on the same basic principle as the exemplified embodiments described above with reference to Figs. 1 to 5 are, of course, possible. For example, the compression spring can be replaced by a tension spring operative correspondingly between the locking pin and the hand lever. Instead of the positive connection between the locking pin and the spring means, a non-positive connection can be used. The connection between the spring means and the hand lever may be either positive or non-positive. Moreover, the edge of substantially V-shaped cross-section can be bent perpendicularly to the axis of rotation of the shank so that the two limbs thereof have either a positive or a negative radius of curvature.

The features of the invention disclosed in the above description, in the drawing, and in the claims, are important both individually and in any combination to embodying the invention in its various forms.



CLAIMS

1. A rotary lock comprising a locking pin axially rotatable in a housing and comprising a shank, at each end of which a transverse latch is secured, and which is subject to the action of a hand lever, the rotary lock being adapted to be brought basically into three positions relatively to the corner fittings of a container for the purpose of releasably connecting two containers one upon the other, said three positions being the locking position of one transverse latch, of the other transverse latch, or of both transverse latches, characterised in that only one spring means (33) is required which is connected on the one hand to the hand lever (30) and on the other hand to the locking pin (10), and the housing (20, 20') comprises a locking means (24, 24', 25, 25', 26, 26') to lock the hand lever and hence the locking pin (10) in positions corresponding to the said three positions of the transverse latches (12, 12'), that position in which the two transverse latches (12, 12') are in their locking position being the basic position of the rotary lock and any rotation of the locking pin (10) out of this position, irrespectively of whether to the left or right, so takes place against the force of the spring means (33) that energy can be stored in the spring means (33) for subsequent automatic locking.

2. A rotary lock according to claim 1, characterised in that the housing consists of two identical halves (20, 20') secured to one another in a 180° relatively rotated position perpendicularly to the longitudinal axis of the rotary lock, the longitudinal axis being identical to the axis of rotation of the locking pin (10).



3. A rotary lock according to claim 1 or 2, characterised in that the two transverse latches (12, 12') are of identical formation, have substantially rectangular sections preferably formed from hexagons with rounded edges, which taper conically away from the shank (11) to form an entry guide (13, 13') for the purpose of independent rotation into a slot (41, 41') of a corner fitting (40, 40') of a container, and are so connected to other elements of the rotary lock via the locking pin (10) that they can be locked and unlocked on the same principle.

4. A rotary lock according to any one of the preceding claims, characterised in that the hand lever (30) and the transverse latches (12, 12') extend perpendicularly to the axis of rotation of the shank (11), one transverse latch (12) extending exactly the same amount rotated to the left as the other transverse latch (12') rotated to the right with respect to the hand lever (30).

5. A rotary lock according to any one of the preceding claims, characterised in that the two transverse latches (12, 12') are disposed turned through approximately 46 to 60°, preferably 50 to 56°, relatively to one another about the axis of rotation of the shank (11).

6. A rotary lock according to any of the preceding claims, characterised in that the housing (20, 20') comprises a shell (21) surrounding the shank (11) of the locking pin (10) and, in the middle, between the two transverse latches (12, 12'), a middle part (22) which serves as a spacer means between two stacked containers and comprises the locking means (24, 24', 25, 25', 26, 26'), the hand lever (30) being so disposed relatively to the middle part (22) that it can be engaged with the locking means (24, 24', 25, 25', 26, 26').



7. A rotary lock according to claim 6, characterised in that the pivotable hand lever (30) at least partially traverses the middle part (22) in a passage (27, 27').

8. A rotary lock according to any one of the preceding claims, characterised in that the hand lever (30) has at one end a handle (35) projecting from the housing (20, 20'), its other end is connected to the spring means (33) and it comprises at least one sliding pin (32, 32') which extends from the hand lever (30) parallel to the axis of rotation of the shank (11) between the spring means (33) and the handle (35), preferably two sliding pins (32, 32') being provided, of which one (32) extends in the direction of one transverse latch (12) and the other (32') in the direction of the other transverse latch (12').

9. A rotary lock according to claim 8, characterised in that the handle (35) of the hand lever (30) is formed parallel to the axis of rotation of the shank (11).

10. A rotary lock according to claim 8 or 9, characterised in that the hand lever (31) comprises means (31) for securing it against rotation between the spring means (33) and the or each sliding pin (32, 32') in order to secure it against turning inside the middle part (22).

11. A rotary lock according to any one of claims 8 to 10, characterised in that the spring means is a compression spring (33) which at least partially surrounds the hand lever (30) concentrically.

12. A rotary lock according to claim 11, characterised in that the locking pin (10) has in the region of the middle part (22) of the housing (20, 20') a middle portion (14) having a recess (16) to accommodate part of the hand



lever (30) and the compression spring (33), the recess (16) comprising a shoulder (17) which serves to limit the expansion of the compression spring (33) and provides a positive connection between the compression spring (33) and the locking pin (10).

13. A rotary lock according to any one of claims 8 to 10, characterised in that the spring means is a tension spring which is connected non-positively both to one end of the hand lever (30) and to the locking pin (10).

14. A rotary lock according to claim 13, characterised in that the locking pin (10) has in the region of the middle part (22) of the housing (20, 20') a middle portion (14) on which a connecting element is disposed to fix the tension spring.

15. A rotary lock according to any one of claims 8 to 14, characterised in that to form the locking means the middle part (22) is formed, on the side facing the handle (35) of the hand lever (30), with an edge (23, 23') of substantially V-shaped cross-section with three locking recesses (24, 24', 25, 25', 26, 26') to accommodate a sliding pin (32, 32') of the hand lever (30), the first locking means (24, 24') for securing the basic position of the rotary lock being disposed in the middle between the two limbs (23, 23') of the V shape, the second locking recess (25, 25') for securing the locking position of just the top transverse latch (12) being disposed in the left-hand limb (23) of the V shape when viewed from beneath looking towards the middle part (22), and the third locking recess (26, 26') for securing the locking position of just the bottom transverse latch (12') being disposed in the right-hand limb (23') of the V shape when viewed from beneath looking towards the middle part (22).



16. A rotary lock according to claim 15, characterised in that at the two opposite edges (23, 23') facing the handle (35) and enclosing the hand lever (30) the middle part (22) has a substantially V-shaped cross-section with in each case three aligned locking recesses (24, 24', 25, 25', 26, 26') in such manner that a sliding pin (32, 32') of the hand lever (30) rests in each case on a V-shaped edge (23, 23') and can be brought into a locking recess (24, 24', 25, 25', 26, 26').

17. A rotary lock according to claim 15 or 16, characterised in that the two limbs of the edge (23, 23') of substantially V-shaped cross-section are bent perpendicularly to the axis of rotation of the shank, the radius of curvature being positive or negative optionally for each limb.

18. A rotary lock according to any one of claims 8 to 17, characterised in that in the basic position of the rotary lock, the hand lever (30) is so disposed as to extend along the line connecting the two housing halves (20, 20') in the middle of the middle part (22), contacts a sliding pin (32, 32') in a first locking recess (24, 24'), the top transverse latch (12) extends turned through 23 to 30°, preferably 25 to 28°, to the left relatively to the connecting line and the bottom transverse latch (12') correspondingly extends rotated through 23 to 30°, preferably 25 to 28°, to the right relatively to the connecting line when viewed from beneath looking at the transverse latches (12, 12').

19. A rotary lock according to claim 18, characterised in that a sliding pin (32, 32') is adapted to slide from the first locking recess (24, 24') along the corresponding V-shaped edge (23, 23') against the force of the spring

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means (33) in the direction of the second locking recess (25, 25') or in the direction of the third locking recess (26, 26') in such manner that the hand lever (30) is disposed with its end having the handle (35) further away from the axis of rotation of the shank (11) than in the basic position, whereby energy can be stored in the spring means (33).

20. Any novel feature or combination of features disclosed herein.