April 25, 1939. A. W. MOLINARE 2,155,732

PERMUTATION PADLOCK

Filed Nov. 26, 1934 2 Sheets-Sheet 1

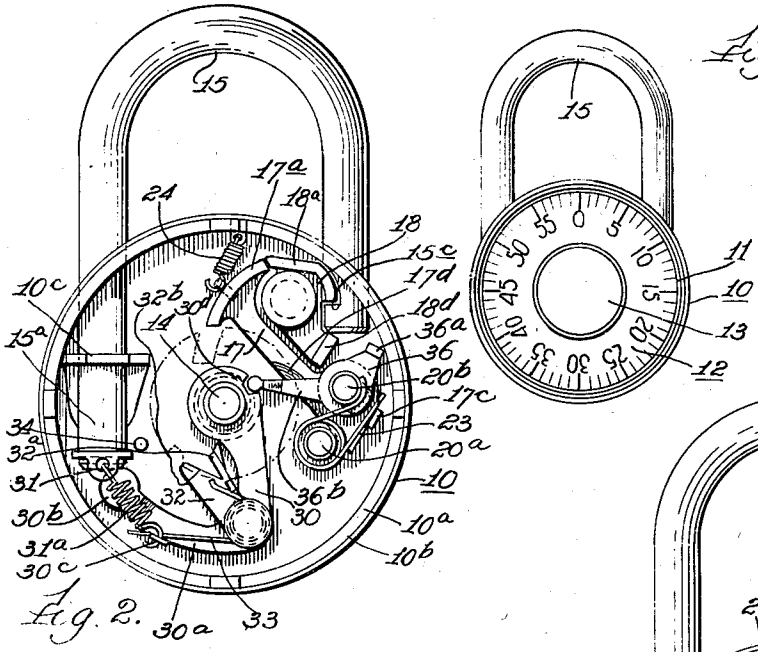


Fig. 1.

Fig. 2.

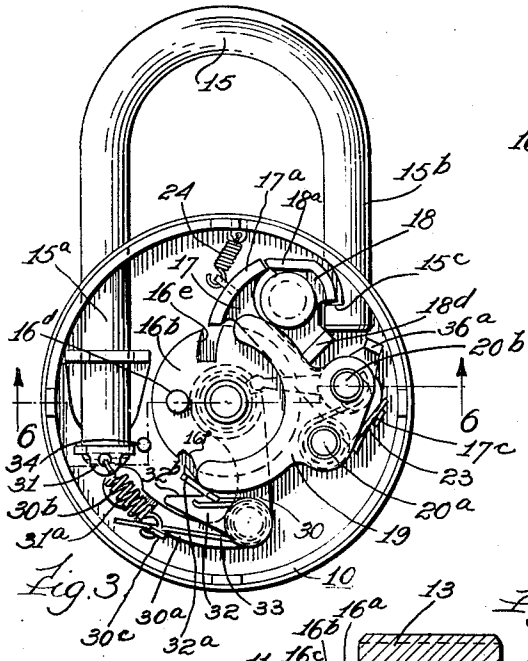


Fig. 3.

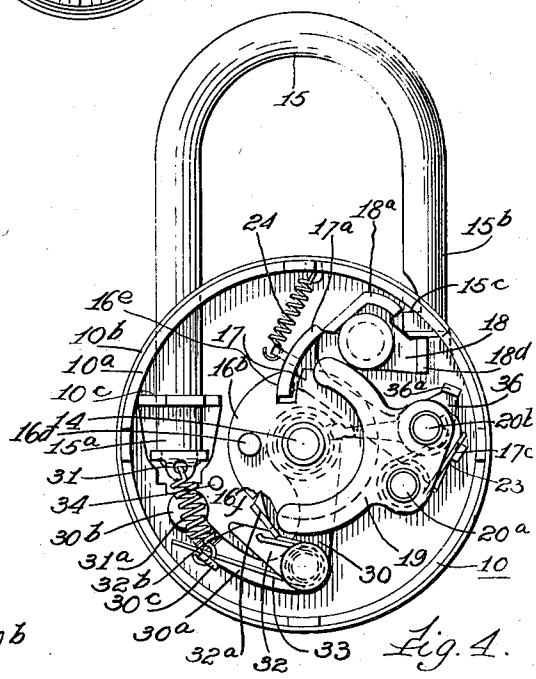


Fig. 4.

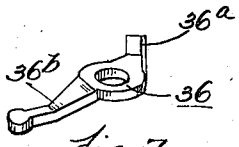


Fig. 7.

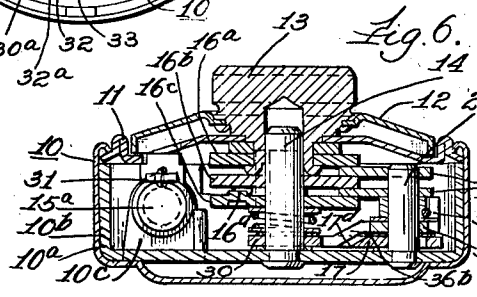


Fig. 6.

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PERMUTATION PADLOCK

Filed Nov. 26, 1934 2 Sheets-Sheet 2

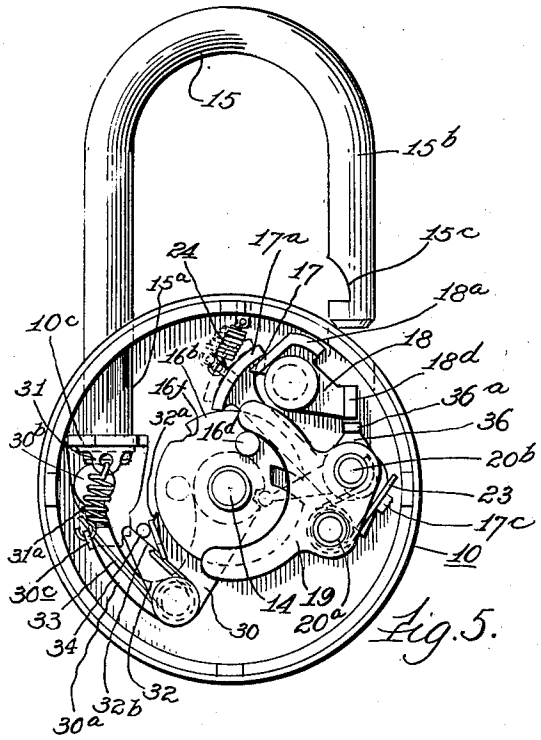
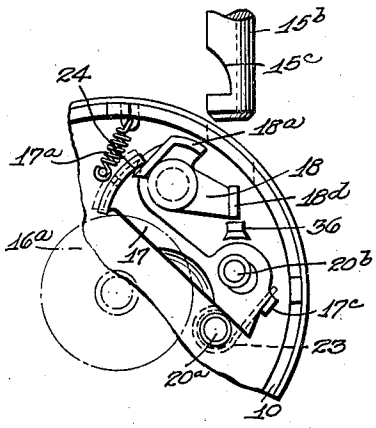


Fig. 5.

Fig. 5a



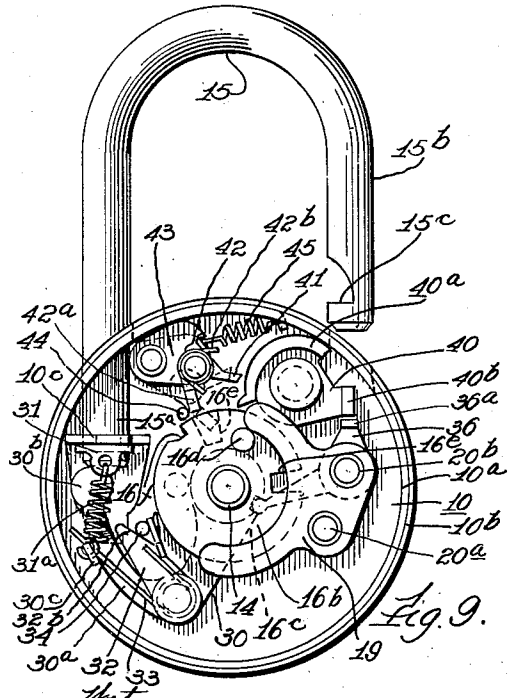


Fig. 9.

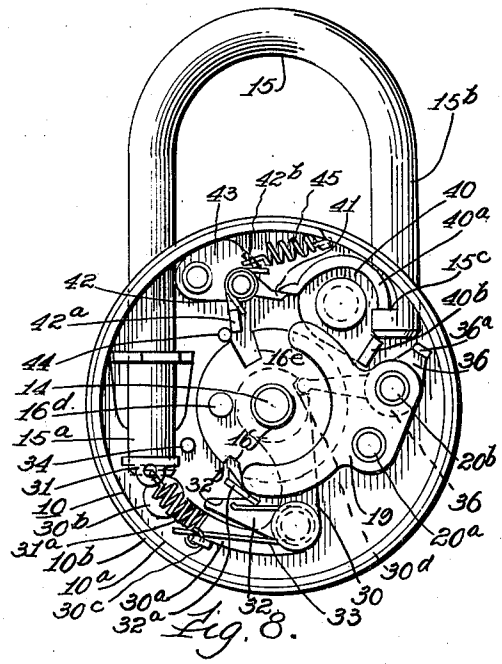


Fig. 8.

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Patented Apr. 25, 1939

2,155,732

UNITED STATES PATENT OFFICE

2,155,732

PERMUTATION PADLOCK

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Application November 26, 1934, Serial No. 754,719

16 Claims. (Cl. 70—25)

This invention relates to improvements in permutation locks and more particularly to padlocks of the automatic type wherein the shackle is locked in the casing upon its insertion therein.

The primary object of this invention is to provide a novel construction and arrangement by virtue of which the tumbler disks, when adjusted in combination, are automatically disarranged with a "snap action" upon the opening movement of the shackle.

Another object resides in the provision of means for automatically disarranging the tumbler disks in the opening movement of the shackle and simultaneously rotating the adjustable indicator element out of its last position of adjustment.

A further object is to provide a novel construction wherein the bolt may be shifted to inactive position and the tumbler disks automatically shifted out of adjusted position upon the opening movement of the shackle, the bolt being adapted for return movement to effective locking position upon locking movement of the shackle.

A still further object is to provide a novel padlock construction including a control element, interposed between the bolt and the tumbler disks and adapted, when the tumblers are adjusted in combination, to complete a cycle of movement into and out of the registered notches of the tumbler disks during the opening movement of the shackle. The construction consists in certain features and elements of construction in combination as herein shown and described and as indicated in the claims.

In the drawings:

Figure 1 is a plan view of a complete padlock embodying the present invention.

Figure 2 is an enlarged plan view of the padlock with the cover and associated dial and the tumbler disks removed.

Figure 3 is a view similar to Figure 2 with the tumbler disks adjusted in combination and showing the relation of the other elements in the locked condition of the lock.

Figure 4 is a view similar to Figure 3 with the tumbler disks adjusted in registration, and the shackle completing the final portion of its opening movement.

Figure 5 is a view similar to Figure 3, showing the relation of the lock parts when the shackle is in open position.

Figure 5a is a fragmentary view with the parts in the same positions as in Figure 5, but with certain elements removed from the pins 20a and 20b to reveal the pivot slot of the lever 17.

Figure 6 is a transverse section through the complete lock device taken as indicated at line 6—6 on Figure 3.

Figure 7 is a detail perspective view of the control element for blocking movement of the bolt.

Figure 8 is a view similar to Figure 3 showing a modified lock construction; the tumbler disks are set in combination the positions of the other elements correspond to the locked condition of the lock.

Figure 9 is a view of the modified construction showing the position of the parts when the shackle is in open position.

Like parts are identified by the same reference characters throughout the several views.

Referring now in detail to the drawings: The lock device includes a casing 10 of cup-shaped form, composed of an inner member 10a and an outer shell 10b as seen in Figure 6. The inner casing member 10a has an annular flange terminating a distance below the corresponding flange of the outer shell 10b, and seated on the edge of the flange of said casing member 10a is a cover element 11 with which is associated a rotatable dial 12 rigidly secured to an adjusting knob 13 which in turn is journaled on an upstanding stud 14 secured centrally to the inner case member 10a as seen in Figure 6. The inner case member 10a is perforated and formed with an upstanding lug, indicated at 10c, which guides and supports the longer and confined end 15a of the U-shaped shackle 15.

Loosely journaled on the upstanding stud 14 is a plurality of tumbler disks 16a, 16b and 16c, the tumbler element 16a being rigidly secured to the hub portion of the knob 13 as seen in Figure 6 of the drawings so as to be rotatable with said knob and dial as a unit. The tumbler disks are provided with inter-engaging lugs 16d as is well understood in the art, by virtue of which the tumbler disks are adjusted in proper combination by turning of said knob. Each of the tumbler disks is provided with a peripheral notch 16e for receiving a cooperating part 17a of an element 17 for controlling the movement of a pivotally mounted bolt member 18. Said bolt member is pivotally secured to the bottom wall of the inner casing member 10a and has an upstanding flange 18a adapted to enter a cooperatively formed notch 15c in the releasable leg 15b of the shackle 15 for locking the shackle in the casing.

The tumbler elements are axially spaced apart on the stud 14 by horseshoe-shaped elements 19 which are apertured for mounting on a pair of transversely spaced-apart upstanding studs 20a

and 20b secured to the inner case member 10a. These spacer elements serve to prevent transmission of rotary motion from one tumbler disk to the other except when the lugs of said tumbler disks are engaged for causing adjustment of one by another. The control member 17 is interposed between the bolt 18 and the tumbler disks, and normally blocks movement of the bolt unless the notches of said tumblers are aligned to receive the cooperating upstanding flange 17a of said member. Said control member is in the form of a lever which is pivotally mounted on stud 20b adjacent the bottom of the casing, one end of the upstanding flange 17a is normally positioned in blocking engagement with the adjacent end of the upstanding flange 18a of the bolt, and the opposite end of said flange 17a terminates in close proximity to the peripheries of the tumbler disks. This flange 17a when the tumbler disks are adjusted with their notches 16e in registered relation therewith, is caused to move into said notches by the motion imparted to said lever through the bolt 18 incident to the opening movement of the shackle. The lever 17 is formed with an elongated slot at its pivotal mounting so as to permit a limited amount of radial movement of the lever in the general direction of its extension. A spring wire 23 is mounted on the stud 20a with a leg portion engaging an upstanding lug 17c at the end of said lever, tending to return the lever to the position indicated in Figures 3 and 4. This lever is formed so that a surface thereof extends in close proximity to the stud 20a against which it abuts when the lever is swung to the position indicated in Figure 3, and thus serves to limit the lever in its clock-wise movement, and provides guided movement thereof in radial direction, as hereinafter described. A coil spring 24 is anchored to the flange of the inner casing member 10a and to the flange 17a of the lever for returning the lever to the position seen in Figure 3, after said flange of the lever has been forced into the registered tumbler notches by the bolt 18 during the opening movement of the shackle.

The end of the upstanding flange 18a of the bolt 18 opposite the portion engaging the shackle is shaped so as to ensure clearance for, and permit freedom of movement of, the lever 17 in returning to normal position during the open condition of the lock. It will be manifest that as the bolt swings in counterclock-wise direction upon the opening movement of the shackle, the end of the flange 18a gradually cams off of the end of the flange 17a of the lever. As seen in Figure 4, the bolt is just about to disengage from the lever 17 and it will be understood that such disengagement with the lever takes place just prior to disengagement of the opposite end of the flange 18a with the notched end of the releasable leg 15b of the shackle. It will also be manifest that during the final portion of unlocking movement of the shackle, the lever 17 is disengaged from the bolt 18 and is returned to normal position by the spring 24, and that then the bolt is disengaged from the shackle, and assumes a position as seen in Figure 5.

Substantially simultaneously with the withdrawal of the flange 17a of the lever 17 out of the notches, 16e of the tumbler disks 16a, 16b, and 16c the tumbler disks are automatically disarranged out of adjusted position. The means for effecting the disarrangement of the tumblers includes a carrier member 30 mounted on the stud 14 adjacent the bottom wall of the inner casing member 10a. Said carrier member is formed with an arm 30a the end of which is rounded and offset at 30b, so as to normally engage the end of the longer leg portion 15a of the shackle, as seen in the drawings. Rigidly mounted on the extreme end portion of the leg 15a of the shackle is a split ring 31 to which is connected a coil spring 31a the opposite end of which spring is secured to an upstanding lug 30c of the arm 30a. Pivotally mounted on the carrier member is a tumbler-disarranging pawl 32 which is formed with a ratchet tooth 32a adapted to engage in cooperatively formed notches 16f of the tumbler disks. A spring wire 33 is positioned for urging the pawl and its ratchet tooth toward the peripheries of the tumbler disks, as may be seen in the drawings. In the locked condition of the lock the carrier member is in the position seen in Figure 3, and this ratchet pawl in such position is cammed clear of the tumbler disks by encounter with the end portions of the spacer elements 19 so that the tumbler elements are free to be rotated by the adjusting knob 13.

During the initial portion of the opening movement of the shackle after the tumbler disks have been adjusted in combination, the spring 31a by reason of its connection to the shackle, leg 15a, and the carrier 30 tends to rotate said carrier, and after a slight travel of the carrier, the pawl 32 rides off of the ends of the spacers 19 and the spring 33 acting on the pawl, projects the ratchet tooth 32a into the registered notches 16f of the tumbler disks. At this time, however, the flange 17a of the control lever has commenced to enter the notches 16e of the tumbler disks, and thus temporarily prevents continued rotation of the carrier and its pawl. In the continued opening movement of the shackle, which, simultaneously through the medium of the bolt 18 moves the flange 17a of the lever to its limit in the notches 16e of the tumbler disks, the spring 31a is becoming tensioned by reason of the fact that the carrier is temporarily arrested due to the disarranging pawl being engaged in the notches 16f of the tumbler disk which cannot move until the flange 17a is withdrawn from the tumbler notches 16e as seen in Figure 4. Now, when the shackle approaches its final portion of unlocking movement, and the bolt 18 disengages from the lever 17 said lever is swung back to normal position by the coil spring 24 and simultaneously with the withdrawal of the flange 17a of the lever 17 from the registered notches of the tumbler disks, the disarranging pawl 32 is permitted to become effective, and under the influence of the stored energy in the tensioned spring 31a causes all of the tumbler disks to be rotated with a "snap action" to a position remote from that originally assumed in their adjusted position. During this movement of the carrier 30 under stress of the spring 31a a cam surface, 32b, of the pawl 32 is brought into contact with an upstanding pin 34 on the bottom of inner casing 10a and cams the ratchet tooth 32a of the pawl 32 out of engagement with the tumbler disks, and the end portion 30b of the carrier arm again encounters the end of the confined shackle leg 15a as seen in Figure 5 of the drawings. Because the dial 12 is rigidly associated with the knob 13 and the tumbler element 16a it will be manifest that the dial will also be rotated with a "snap action" out of its last position of adjustment upon disarrangement of the tumblers. This is a particularly advantageous feature because when the lock device is in open condition

there is no clue whatsoever as to any portion of the lock's combination.

In the closing movement of the shackle the end of the releasable leg 15b encounters an upstanding lug 18d of the bolt 18 and swings the bolt about its pivot into locking engagement with the notch 15c of the shackle, and as the bolt rotates in clock-wise direction, the end of the flange 18a opposite the end engaging the shackle, cams against the under side of the flange 17a of the lever 17 and shifts said lever in radial direction, as indicated in dotted lines in Figure 5, (which movement is permitted by the elongated slot at its pivotal mounting) until the end of the flange 18a of the bolt rides off of the flange 17a of the lever, at which time the spring 23 snaps the lever back to its orginal operative position, as seen in Figure 2, and at which position its flange 17a is aligned with the end of the flange 18a of the bolt and blocks movement of said bolt when an attempt is made to withdraw the shackle until readjustment of the tumbler disks in combination. Simultaneously with the action above described, in the closing movement of the shackle, the end of the leg 15a being in engagement with the offset end portion 30b of the carrier 30 swings said carrier about its pivot to its original position, as seen in Figure 3, at which position the pawl 32 has cammed against the end of the spacers 19 and shifted the ratchet tooth 32a of the pawl out of engagement with the periphery of the tumbler disks.

In order to discourage tampering with the internal mechanism of the lock when the shackle is in unlocked position, there is provided a bell crank type lever 36 mounted on the stud and superimposed upon the control lever 17 as seen in section in Figure 6. This bell crank lever has an arm formed with an upstanding lug 36a and an oppositely extending arm 36b the end of which is formed to engage in a notch 30d of the central area of the carrier element 30. By virtue of this connection it will be seen that when the carrier 30 moves in clock-wise direction incident to the opening movement of the shackle, it will rock the bell crank lever 36 so as to position the lug 36a immediately below the lug 18d of the bolt, and because said lugs are located substantially in alignment with the stud 20b clock-wise movement of the bolt will be effectively blocked until said bell crank lever is again rocked in clock-wise direction, by the closing movement of the shackle, so as to dispose its lug 36a clear of the lug 18d of the bolt, and this movement takes place when the carrier 30 is returned to its original position.

Because of the arrangement of the bell crank lever 36 and its mounting on the control lever 17 the arm 36b includes an angular offset portion so that the terminal of the arm will come in close proximity to the inner bottom wall of the casing 10a on which the central area of the carrier 30 is located, and to avoid any constriction of movement the adjacent edge of the control lever 17 is cut away as indicated at 17d to provide ample clearance.

Referring now to the modified construction disclosed in Figures 8 and 9, it will be seen that the construction in general is quite similar to that above described, with the exception of the form of the bolt and the means for controlling its movement. It is therefore believed sufficient at this time to describe only these differences in construction.

Pivotally mounted on the bottom wall of the inner casing member 10a is a bolt 40 having an upstanding flange 40a for interlocking engagement with the notched end of the releasable leg 15b of the shackle. The opposite end of this flange normally abuts against a lug 41 of a pivoted pawl member 42 mounted on a carrier 43 which, in turn, is pivotally mounted on the bottom wall of the inner casing member 10a. This pawl is formed with a leg portion 42a with its end positioned in close proximity to the peripheries of the tumbler disks, and adapted to enter the notches 16e of the tumbler disks when they are registered. A spring member 42b is mounted for urging the pawl in clock-wise direction so that its terminal portion abuts against an upstanding pin 44 mounted on the bottom wall of the casing 10a and a coil spring 45 is connected to the flange of the inner casing 10a and to the carrier member 43 for returning the carrier and pawl to the position indicated in Figure 8, at which position a surface of the carrier engages the flanged wall of the casing 10a for arresting movement of the parts. Now, when the tumbler disks are adjusted with their notches 16e in registration, the shackle may be withdrawn and during the unlocking movement of the shackle the bolt 40 is rotated in counter-clock-wise direction, and by reason of its engagement with the lug 41 of the pawl 42 the leg portion 42a of the pawl cams against the pin 44 into the notches 16e of the tumbler disks, (as seen in dotted outline in Figure 9) and just prior to disengagement of the bolt 40 by the shackle, its flange 40a disengages from the lug 41 of the pawl 42 and the pawl and its carrier are returned to the position seen in Figure 8, by the coil spring 45 and the bolt is permitted to remain in the position seen in Figure 9. During this cycle of operation the tumbler disks have been disarranged, and the bolt blocked against movement until the shackle is re-entered in the casing, by mechanism which is identical with that above described.

Now, when the shackle is moved in locking direction, the end of the releasable leg 15b engages lug 40b on the bolt, and rotates the bolt in clock-wise direction, and the remote end of the flange 40a of the bolt cams off the under side of the lug 41 of the pawl, which, by reason of its pivotal mounting and the spring 42b is permitted to yield until the bolt rides clear of the lug, and at which time the pawl returns to normal position and the lug 41 becomes positioned in blocking engagement with the bolt 40 and the lock is in locked condition again.

Although I have shown and described certain preferred embodiments of the invention, it will be manifest to those skilled in the art that various modifications and re-arrangements of the parts may be made without departing from the spirit and the scope of the invention, and that the same is not limited to the particular forms herein shown and described, except in so far as indicated by the appended claims.

I claim:

1. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, means under control of said tumbler disks for securing the shackle in locked position, said means including a part movable into the notches of the tumbler disks when they are adjusted in registered relation, means by which movement of the shackle in unlocking direction moves said part into said notches, means acting during completion of the unlocking movement to withdraw said part from the notches, a

tumbler-disarranging pawl engageable with at least one of said disks during said unlocking movement, and spring means acting upon the pawl and connected to be tensioned by the unlocking movement of the shackle, whereby the pawl is shifted and throws said disk out of registered position when said movable part is withdrawn from the notches.

2. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a bolt normally disposed in locking engagement with the shackle, means normally blocking movement of the bolt except when the notches of the tumbler disks are registered, said means including a part movable by the bolt into the registered notches of the tumbler disks when the bolt is disengaged from the shackle, means acting during the unlocking movement of the shackle to withdraw said part from the notches, and means actuated incident to the unlocking movement of the shackle for shifting at least one of said tumbler disks out of registered position upon withdrawal of said part from the notches.

3. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a bolt normally disposed in locking engagement with the shackle, means normally blocking movement of the bolt except when the notches of the tumbler disks are registered, said means including a part movable into the registered notches of the tumbler disks to permit said bolt to move out of locking engagement with the shackle, means moving said part in reverse direction and out of the notches upon disengagement of the bolt with the shackle, tumbler-disarranging means and means for shifting said disarranging means into operative position incident to the movement of the shackle in unlocking direction, said means including a spring and a connection therefrom to the shackle for tensioning the spring in the unlocking movement of the shackle.

4. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a pivoted bolt normally disposed in locking engagement with the shackle, pivoted blocking means for preventing movement of the bolt except when the notches of the tumbler disks are registered, said blocking means including a part movable by the bolt into the registered notches of the tumbler disks to permit said bolt to move out of locking engagement with the shackle, said bolt and blocking means being guided along divergent paths to cause disengagement of said means from the bolt in the latter portion of the movement of said bolt in disengaging the shackle, means for causing said blocking means to withdraw from the tumbler notches upon its disengagement from the bolt, and means actuated incident to the unlocking movement of the shackle for shifting at least one of said tumbler disks out of registered position.

5. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a pivoted bolt normally disposed in locking engagement with the shackle, pivoted blocking means normally interposed between the bolt and said disks and including a part movable by the bolt into the notches of the tumbler disks when they are aligned to permit said bolt to move out of locking engagement with the shackle, said bolt and blocking means being guided along divergent paths to cause disengagement of said means from the bolt in the latter portion of the movement of said bolt in disengaging the shackle, means for causing said blocking means to withdraw from the tumbler notches upon its disengagement from the bolt, said bolt being movable to locking position by the locking movement of the shackle independently of said blocking means, means for adjusting the tumbler disks, and means actuated incident to the unlocking movement of the shackle for positively engaging at least one of said tumbler disks and shifting it out of registered position.

6. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a pivoted bolt normally disposed in locking engagement with the shackle, pivoted blocking means for preventing movement of the bolt until the notches of the tumbler disks are aligned, said blocking means including a part movable by the bolt into the aligned notches of the tumbler disks to permit said bolt to move out of locking engagement with the shackle, said bolt and blocking means being guided by their respective pivots along different paths, whereby said means becomes disengaged from the bolt during the unlocking movement of said bolt, spring means for returning said blocking means to normal operative position after such disengagement from the bolt, means whereby said bolt is returned to operative position by the locking movement of the shackle independently of said blocking means, and means actuated incident to the unlocking movement of the shackle for positively engaging at least one of said tumbler disks for shifting it out of registered position.

7. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, means for adjusting said tumbler disks, a swinging bolt normally disposed in locking engagement with the shackle, and a pivoted lever having a part interposed between said bolt and the tumbler disks for preventing movement of the bolt incident to the unlocking movement of the shackle until the notches of the tumbler disks are aligned to receive said part of the lever, said bolt being movable in a path which carries it out of engagement with said part of the lever just prior to disengagement of the bolt by the shackle in its unlocking movement, and said lever being returnable to its original position after disengagement by the bolt and independently thereof, said lever having an elongated slot at its pivotal connection to permit limited radial movement thereof by the bolt when said bolt returns to locking position.

8. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, means for adjusting said tumbler disks, a swinging bolt normally disposed in locking engagement with the shackle, a pivoted lever having a part interposed between said bolt and the tumbler disks for preventing movement of the bolt incident to the unlocking movement of the shackle until the notches of the tumbler disks are aligned to receive said part of the lever, said bolt being movable in a path which carries it out of engagement with said part of the lever just prior to disengagement of the bolt by the shackle in its unlocking movement, and said lever being returnable to its original position without moving the bolt from its unlocked position, said lever having an elongated slot at its pivotal connection to permit limited radial movement thereof by the bolt when it returns to locking position, and a spring positioned to oppose such radial movement of the lever.

9. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, means for adjusting said tumbler disks, a swinging bolt normally disposed in locking engagement with the shackle, a pivoted carrier, and a pawl pivoted to the carrier, said pawl being positioned between the bolt and the tumbler disks for preventing movement of the bolt in direction to release the shackle except when the notches of the tumbler disks are registered to receive said bolt, said bolt being movable in a path which carries it out of engagement with said pawl just prior to disengagement of the bolt by the shackle in its unlocking movement, and means for returning said carrier and pawl automatically to normal position upon disengagement from the bolt.

10. In a permutation padlock, a shackle, a plurality of tumbler disks, means normally maintaining the shackle in locking position, said means being under the control of the tumbler disks and movable, when said disks are properly adjusted, to release said shackle for unlocking movement, tumbler-disarranging means responsive to the unlocking movement of the shackle and movable into operative engagement with at least one of the tumbler disks for positively shifting said tumbler disk out of adjusted position, and means operatively connected to said tumbler-disarranging means and movable thereby in response to unlocking movement of the shackle into position for blocking movement of said shackle-retaining means toward its locking position while said shackle is in unlocked position.

11. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a pivoted bolt normally disposed in locking engagement with the shackle, pivoted blocking means for preventing movement of the bolt except when the notches of the tumbler disks are registered, said blocking means including a part movable by the bolt into the registered notches of the tumbler disks to release said bolt for movement out of locking engagement with the shackle, said bolt being movable in a path which carries it out of engagement with said blocking means just prior to disengagement of the bolt by the shackle in its unlocking movement, means actuated incident to the unlocking movement of the shackle for engaging at least one of said tumbler disks and shifting it out of registered position, and means operatively connected to said tumbler-disarranging means and movable thereby into position for blocking movement of the pivoted bolt toward its locking position while said shackle is in unlocked position.

12. In a permutation padlock, a shackle, a plurality of tumbler disks, means holding the shackle in locking position, said means being under control of the tumbler disks and movable, when said disks are properly adjusted, to release said shackle for unlocking movement, and means movable in response to the unlocking movement of the shackle and engageable with at least one of the tumbler disks for shifting it out of registered position, said means including a spring device adapted to be tensioned by said shackle movement and said shackle-holding means including means blocking movement of said tumbler disk during the initial portion of the unlocking movement of the shackle but shiftable suddenly to release the tumbler in response to the final portion of said shackle movement whereupon the tensioned spring device operates with a snap action for rotating said tumbler disk out of adjusted position.

13. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches, a pivoted bolt normally disposed in locking engagement with the shackle, pivoted blocking means for preventing movement of the bolt until the notches of the tumbler disks are registered, said blocking means including a part movable into the registered notches of the tumbler disks to permit said bolt to move out of locking engagement with the shackle, said bolt and blocking means being pivoted on different centers such that the bolt is movable in a path which carries it out of engagement with said blocking means, means automatically withdrawing said blocking means from the tumbler notches upon disengagement of the bolt from the blocking means, and means movable in response to the unlocking movement of the shackle and engageable with at least one of the tumbler disks for shifting it out of registered position instantly upon withdrawal of said blocking means from the tumbler notches, said means including a spring device adapted to be tensioned by said shackle movement and released with a snap action for shifting the tumbler.

14. In a permutation padlock, a shackle, a plurality of tumbler disks having alignable peripheral notches and having inter-engaging features for adjusting one disk by another, a bolt normally disposed in locking engagement with the shackle, means for blocking movement of said bolt until the notches of the tumblers are aligned, said means including a part movable by the bolt into the aligned notches of the disks to permit said bolt to move out of locking engagement with the shackle, means automatically withdrawing said part from the notches during the latter portion of the movement of the shackle to unlocking position, exteriorly accessible means connected to one of the tumbler disks for adjusting said tumblers with their notches in aligned relation, said means including a movable indicator and a cooperating fixed index, actuating means normally disposed out of engagement with one of the tumbler disks and shiftable into operative relation therewith in response to movement of the shackle to unlocking position, and means for rendering said actuating means effective for shifting said tumbler disk, and with it the adjusting member and its movable indicator, out of adjusted position in response to the unlocking movement of the shackle.

15. In a permutation padlock, a shackle, a rotatably adjustable tumbler, a bolt normally engaged with the shackle to retain it in locking position, said tumbler normally blocking the bolt against disengagement from the shackle, externally adjustable means including a movable indicator and a cooperating fixed index, said means being operatively related to the tumbler for adjusting it to a position at which it releases the bolt, a pawl operable upon said adjustable means for shifting it out of adjusted position, and spring means acting upon the pawl and connected to be tensioned by the unlocking movement of the shackle, whereby the pawl is shifted and throws said adjustable means out of adjusted position when the shackle is withdrawn in its unlocking movement.

16. In a permutation padlock, a casing, a shackle having one end adapted to be withdrawn from the casing when unlocked, mechanism within the casing for retaining the shackle in

locked position, externally adjustable means including a movable indicator and a cooperating fixed index, said means being operatively related to the mechanism within the casing for adjusting it to a position for releasing the shackle, a pawl within the casing operable upon said adjustable means for shifting it out of adjusted position, spring means acting upon the pawl and connected to be tensioned by the unlocking movement of the shackle, and means temporarily resisting the pawl but releasable by the final portion of the unlocking movement of the shackle, whereby the pawl operates with a snap action under tension of its spring to shift the adjustable means from adjusted position.

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