Feb. 13, 1940. K. C. BUGG 2,189,880

LOCK

Filed May 2, 1938 2 Sheets-Sheet 1

Fig. 1.

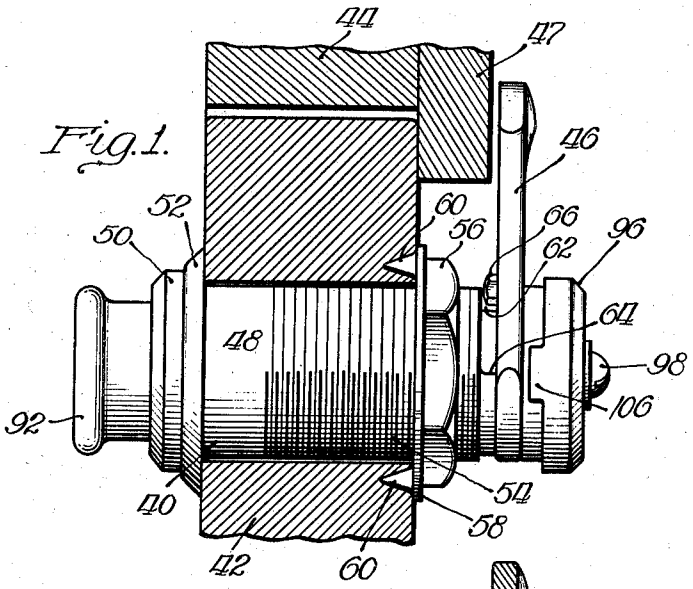


Fig. 2.

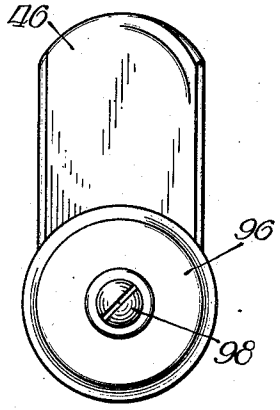


Fig. 3.

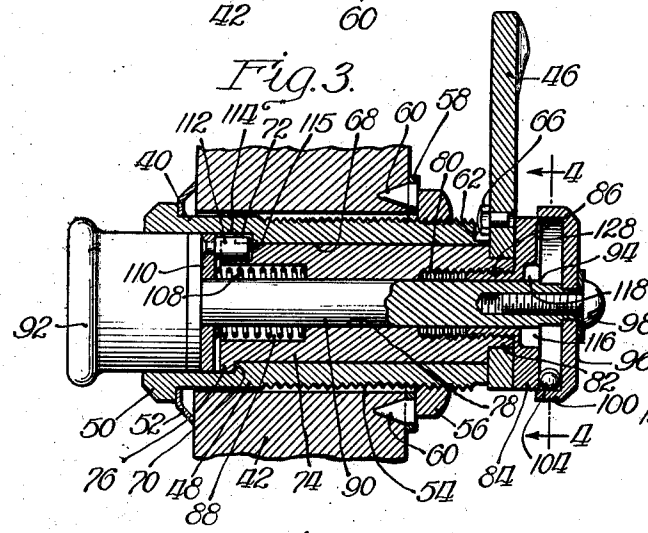


Fig. 4.

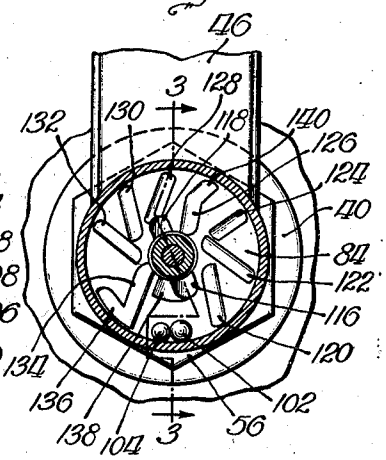


Fig. 5.

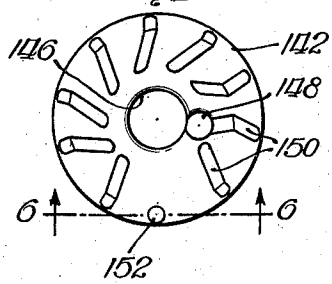
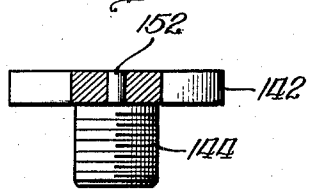


Fig. 6.



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Feb. 13, 1940. K. C. BUGG 2,189,880

LOCK

Filed May 2, 1938 2 Sheets-Sheet 2

Fig. 7

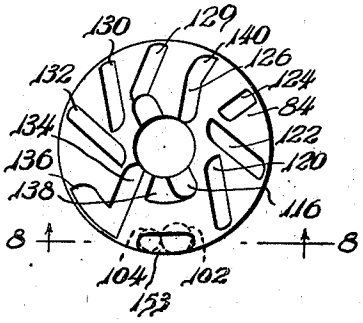


Fig. 8

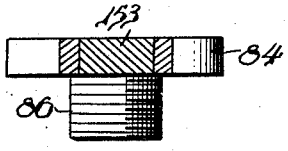


Fig. 9

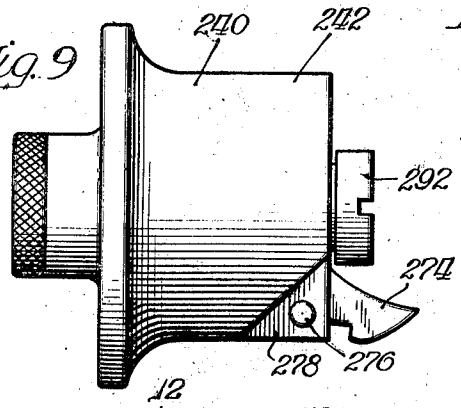


Fig. 10.

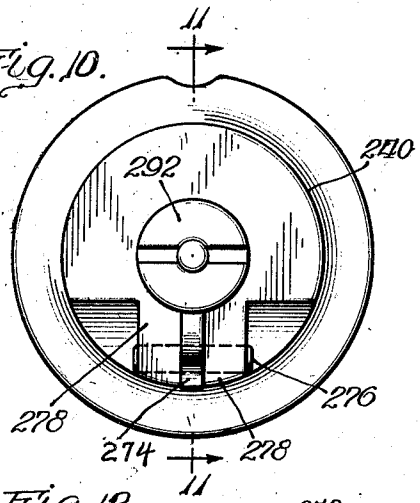


Fig. 11.

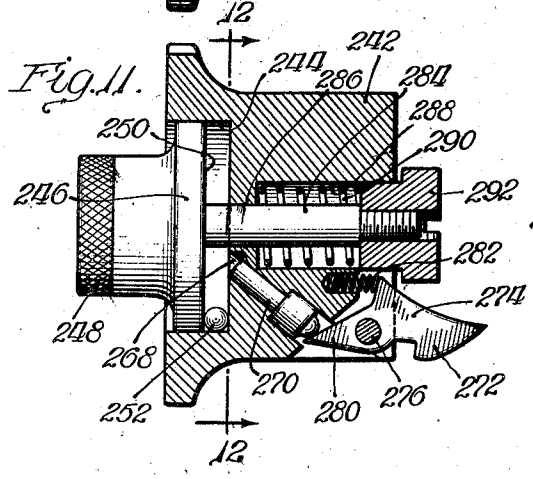
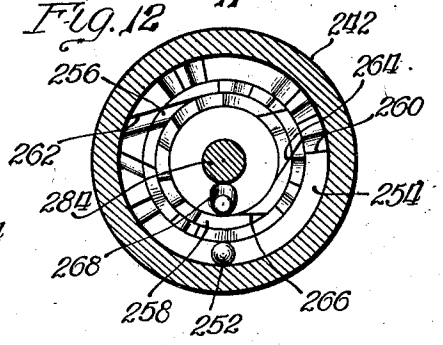


Fig. 12



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Patented Feb. 13, 1940 2,189,880

UNITED STATES PATENT OFFICE

2,189,880

LOCK

Kenly C. Bugg, Farmington, Mo.

Application May 2, 1938, Serial No. 205,648

24 Claims. (Cl. 70—289)

This invention pertains to locking mechanism, and more particularly to combination locks.

It is an object of this invention to provide a sightless combination lock wherein at least a part of the operating mechanism is positively positioned in a predetermined position for one direction of its movement.

Another object is to provide a combination lock wherein the combination is exactly determined for controlling the operating mechanism of the lock in one direction of rotation only. Unauthorized operation, or movement in an unpredetermined direction serves to render the operation of the combination impossible.

Still another object is to provide a combination lock utilizing track or maze members, at least one of which is capable of moving a plurality of members in a predetermined sequence for perfecting operation of the lock.

A further object is to provide a sightless combination lock susceptible of immediately and positively positioning the lock at zero position, and wherein the operation may be effected through the sense of sound or feeling.

A still further object is to provide a sightless combination lock which depends upon the touch or sound to determine the proper operation of the lock, but will only register by touch or sound in one direction of operation.

A different object is to provide a lock which can only be operated in a predetermined sequence and, unless so operated, is conditioned to disrupt the sequence of operation, making it necessary to zeroize the lock and thereafter perform the complete correct combination before the lock can be opened. Another different object of the invention is to provide a combination lock adapted to be zeroized in such a manner that at least one of the operating members is attracted to a predetermined position.

A further different object is to provide a lock wherein a secondary movement is necessary for operation of the lock.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate embodiments of the device and wherein like reference characters are used to designate like parts—

Figure 1 is an enlarged sectional elevation through adjacent relatively movable and stationary members, as a door and associated jamb, showing in side elevation a form of lock embodying the invention in locked position;

Figure 2 is an end elevation of the striker or cam and one of the track members of the lock shown in Figure 1, the same looking toward the left as viewed in said figure;

Figure 3 is an enlarged sectional elevation taken substantially in the plane of the longitudinal center line of certain parts of the lock shown in Figure 1, showing certain movable elements in zero position, and the striker or locking member in locked position, the section through the track members being taken substantially in the plane as indicated by the line 3—3 of Figure 4;

Figure 4 is an enlarged transverse sectional elevation taken substantially in the plane as indicated by the line 4—4 of Figure 3;

Figure 5 is an enlarged top plan view of a modified form of maze embodying the invention;

Figure 6 is an elevation, partly in section, of the maze illustrated in Figure 5, the section being taken substantially in the plane as indicated by the line 6—6 of Figure 5;

Figure 7 is an enlarged top plan view of a maze similar to that shown in Figure 4 showing the application thereto of positioning means similar to that shown in Figure 5;

Figure 8 is an elevation partly in section of the maze illustrated in Figure 7, the section being taken substantially in the plane as indicated by line 8—8 of Figure 7;

Figure 9 is an enlarged side elevation of a modified form of lock assembly;

Figure 10 is an end elevation of the lock illustrated in Figure 9, the same looking toward the left as viewed in said figure;

Figure 11 is a longitudinal sectional elevation through certain parts of the lock illustrated in Figures 9 and 10, the same being taken substantially in the plane as indicated by the line 11—11 of Figure 10;

Figure 12 is a transverse sectional elevation showing the maze of the lock illustrated in Figures 9, 10 and 11, the same being taken substantially in the plane as indicated by the line 12—12 of Figure 11.

This application is a continuation-in-part of Patent No. 2,116,011, granted May 3, 1938, to the inventor herein, Kenly C. Bugg, for Lock.

Referring first of all more particularly to the lock shown in Figures 1 to 4 inclusive, the lock is shown as applied, for example, to a cabinet. In this construction the lock 40 is fixedly supported, preferably on a movable part 42 of a cabinet adjacent a stationary part 44 of said cabinet in such a

position that when fully locked the striker (locking member, cam or bolt) 46 of the lock will overlap a portion of the stationary member 44, as the striker plate 47, to prevent movement of the movable part 42 toward the left or to open position as viewed in Figure 1.

The lock consists essentially of a casing or barrel 48 provided at one end with a shoulder 50 providing a backing or engaging means for the plate 52 which is adapted to be disposed between the shoulder and the member 42. A portion of the casing is threaded as at 54 for receiving fastening means such as the nut 56, which is adapted to position the lock when applied to the threaded portion 54. A plate 58 is preferably disposed between the member 42 and the nut 56 and is suitably interlocked with the casing 48 so that it is non-rotatably connected thereto and may be provided with the spaced fastening means 60 which, when in applied position, prevents rotation of the lock. A substitution for this means may be effected by flattening a portion of the casing 48 (not shown) and inserting the lock in a correspondingly shaped aperture in the member 42 whereby turning of the casing is prevented.

The casing of the lock when in applied position extends beyond the nut 56 at the rear end of said lock, and is provided with the spaced shoulders or stops 62 and 64 adapted to provide limiting means for the stop 66 provided on the striker 46 whereby the striker can only be moved a predetermined amount, which in the construction illustrated is ninety degrees. The casing is provided with an elongated aperture 68 extending therethrough and terminating at the operating end of the lock in a shouldered portion 70, said shouldered portion being provided with a slot 72 in substantial alignment with the stop 62.

The revoluble member (sleeve or cylinder) 74 extends through the elongated aperture 68, being rotatably mounted in the casing, said revoluble member being provided with the flange 76 rotatably mounted on the shouldered portion 70. Said member 74 extends through the casing, and is provided with the elongated centrally disposed aperture 78 terminating adjacent the inner end thereof with the threaded portion 80. The striker 46 is mounted on the projection 82, preferably elongated in plan in order to prevent relative rotation between the striker 46 and the revoluble member 74, and said striker is retained in place by the inner track member, guiding member or maze 84, said maze having an inwardly projecting threaded portion 86 adapted to be received by the threaded portion 80, and when the maze is secured in its innermost position, it overlaps and forms securing means for the striker.

The opposite end of the revoluble member 74 is recessed as at 88, and the shaft 90 extends through the recess, and is revolubly mounted with respect to the revoluble member 74 and the maze 84, extending beyond said maze. The shaft is provided at one end with the operating member or knob 92, a portion of the operating member being journaled in the casing 48, the opposite end of the shaft being provided with the shoulder 94, and the plane outer track member (race, disk or ball cup) 96 is non-rotatably mounted on the end of the shaft as at 98. Said track member is preferably provided with the flange 100 extending toward the maze 84 and a plurality of operating or spacing members such as the balls 102 and 104 of different diameters are disposed between the track members 84 and 96. The flange 100 is provided with depending lugs 106 suitably placed on the periphery of the flange adapted to embrace and engage the striker 46 in a certain operation to be later described, whereby the striker can be turned by the knob 92.

A spring 108 is disposed in the recess 88, one end of the spring engaging the revoluble member, the other end of the spring engaging the disk 110, said disk being revolubly mounted or floating with respect to the shaft 90 and frictionally engaging the operating knob 92, said disk being provided with the depending or protruding member or pin 112 adapted to be received in the notch 114 provided in the flange 76, the recess 115 provided in the revoluble member 74, and the slot 72 provided in the casing, it being observed that said pin is only received in said notch, recess and slot when the striker is in fully locked position, and when received in said slot, recess and notch the revoluble member is held fixed with respect to the casing. Thus the spring 108, which is of the expansion type, frictionally and successively holds the balls 102 and 104 between the track members. The details of the operation and purpose of the disk 110 and its associated mechanism is fully disclosed in said Patent No. 2,116,011 granted May 3, 1938.

The inner ball engaging surface of the outer track 96, as has already been explained, is a plane member. The inner track member or maze which, in the construction shown, is cut or formed for a lock having a combination of 3–5–4–1, is provided with recesses, depressions or tracks disposed relative to each other to give this combination, one of the tracks terminating in a depression 116 of a proper size to receive the large ball 102, another of the tracks terminating in the depression 118 to receive the small ball 104, whereby when said balls are properly received the knob 92, the shaft 90, and the track member 96 are permitted to move toward the left as viewed in Figure 1 to a position wherein the lugs 106 may engage the sides of the striker, or receiving means provided thereon, permitting operation of the striker, it being observed that when this movement toward the left takes place, the pin 112 is withdrawn from the slot 72 to permit movement of said striker. When movement from the fully locked position causes the pin 112 to be placed above the shouldered portion 70 of the casing whereby it will be impossible to move the operating member, the shaft and race 96 toward the right, or toward zeroized position as viewed in said figure until the lock is returned to a predetermined position which, in the instance shown, is the fully locked position.

When the lock is returned to fully locked position, bodily movement, or movement of translation of the shaft 90 toward the right, causes the shoulder 94 to move the balls 102–104 out of their depressions 116–118 where they will immediately fall to the lowermost or zero position, after which it will be necessary to operate the lock in its set or predetermined combination before it can be again unlocked.

During operation of the lock, in the event a mistake is made in the combination, it can be immediately zeroized by moving the operating member toward the right as viewed in said figure, releasing the frictional engagement between the balls and the track members which permit the balls to fall to the lowermost or zero position.

As stated above, the lock shown is adapted to operate on a 3–5–4–1 combination. While the majority of the mazes shown herein are shown and described as provided with track members

which take the form of depressions, it is of course understood that raised portions may be provided of a character complementary to the depressions. The track or maze 84, as viewed from the zero and fully lock position, is provided with the first track 120, the second track 122, each extending inwardly a sufficient distance to accommodate the outermost paths of the balls, and their second paths of movement. As the tracks are spaced by the larger ball only, the larger ball will be moved by the tracks for a predetermined distance unless in zeroizing the smaller ball is disposed to the right of the larger ball as viewed in Figure 4. In that case, when the larger ball reaches substantially its first 90 deg. position, the smaller ball immediately drops to the lowermost position to await its sequence of operation in the combination. The third track 124 is adapted to receive the (larger) ball, and as the lock is set for a movement of the shaft in a counterclockwise direction as viewed in Figure 4, if the movement is reversed, that is, if movement of the shaft 90 is in a clockwise direction, the larger ball 102 will move inwardly to a position determined by the inner end of the track 124. Reversal of the shaft to again rotate the track 96 in a counterclockwise direction causes the larger ball to move over the tracks 126—128—130—132 to the track 134, which is set in a reverse direction, as was track 124, being provided with the portion 136 disposed in a peripheral direction so that the correct combination is set up. That is, in the lock shown it is impossible, with the portion 136, to count from zero to eight, and operate through the second path of movement. Likewise, this forms a trap for the balls, if the combination is attempted to be felt, operating from zero and in a clockwise direction.

Again reversing the movement of the member 96, or the shaft 90, at the track 134 causes the large ball to move inwardly to its third path of movement, whereupon the shaft 90 and the disk 96 are again moved in a counterclockwise direction to move the large ball in its third path of movement into the track 138, where it is directed into the depression 116. When the large ball falls into the depression 116, one audible sound is made. At that time the member 96 picks up the small ball which has remained in its zero or lowermost position, for the second count of the third number, that is, four. The small ball is then moved over the tracks 120—122 to the track 124, whereupon reversal of movement of the shaft 90 causes the small ball to move inwardly to its second path of movement. Again moving the shaft 90 in a counterclockwise direction, the ball is moved to the inwardly directing track 126, at which track the ball is moved inwardly toward the center by reversing the shaft 90 to a clockwise direction, whereupon a counterclockwise movement will cause the small ball to move into the depression 118, the spring 108 tending to move the knob 92 outwardly or toward the left to permit the lugs 106 to engage the striker 46.

In the event that the lock is not operated correctly, that is, if reversal of movement of the shaft 90 occurs before the proper number of tracks have been passed, or before the balls have moved their proper distances in the sequence of operation of said balls, such reversal will cause the ball then moving to move outwardly, whereupon the lock must be zeroized before the combination can be performed.

It is to be noted that with this construction it is not necessary to provide circular tracks for the ball, as the ball will roll in a true circle in the construction illustrated so that expensive circular tracks are obviated. It will also be noted that when the balls are in their zero position such as illustrated in Figure 4 there is a three-point contact between one of the balls, the maze 84, the plane surface of the disk 96, and the flange 100 of said disk. Such a three-point contact can be relieved, thus eliminating wear on the ball and any telltale squeak by terminating the outer ends of the tracks (120—122—124), portion 140 of the track 126, and tracks 128—130—132—136 short, or inwardly, of the periphery of the maze 84, or in other words, such tracks are terminated so that when the balls enter the first track 120 they will move slightly away from the flange. Having once been moved away from the flange there will just be a contact between the ball then in operation, the maze 84 and the plane surface of the disk 96.

The maze illustrated in Figures 5 and 6 is shown for use with a single ball type of lock such as illustrated in said Patent No. 2,116,011, but it is understood of course that the form of maze may be used such as shown in Figures 4, 7 and 8. This maze 142 is provided with the securing threaded portion 144 similar to the portion 86 provided with the central aperture 146 and the ball receiving recess 148. The tracks 150 are so disposed as to give the combination 3–6–2 for a single ball lock. In order to prevent the inertia of the ball in dropping from a high point of the lock from carrying the ball to a position where it may be trapped in other than zero position, a spot magnet 152 is placed adjacent the periphery of the maze and at the lowest point thereof, that is, zero position. This spot magnet will quickly arrest movement of the ball and insure the starting of the lock at zero position. In adapting the use of the positioning means in the form of the spot magnet to the maze illustrated in Figure 4, said maze 84 is preferably provided with the elongated spot magnet 153 disposed between the first track 120 and the track 134 in a position preferably at the lowest or zero point of said maze whereby when the lock is zeorized by moving the knob 92 shown in Figure 3 inwardly the balls 102 and 104 will immediately assume a lowermost position such as indicated by the dotted lines illustrated in Figure 7. It will thus be seen that when the knob 92 is turned the larger ball 102 will move in its predetermined sequence until the smaller ball is picked up from the magnet. Even though the smaller ball may fall ahead of the larger ball 102, the proper operation will not be effected, but will be the same as described with respect to the modification illustrated in Figures 1 to 4 inclusive.

Referring now to the construction illustrated in Figures 9 to 12 inclusive, the lock 240 consists essentially of the outer case member 242 recessed as at 244 for the reception of cylindrical dial 246 journalled therein and adapted to be operated by the knob 248, the dial in this instance being plain. The inside surface 250 of the dial is a plane surface and adapted to contact the ball 252, said ball being adapted to be rolled along the spaced tracks 254—256—258 in a predetermined manner. In the instance shown, the tracks are provided with the ridges 260 for providing the audible sounds, the tracks being connected by means of the diagonal ridges 262—264—266, the last named ridge directing the ball to be received in a depression 268. In the disposition of the ridges 260 and the connecting ridges 262—264—266, said ridges are arranged in a combination

of 6–6–9 in the embodiment illustrated. When the ball is rotated to be received in the depression 268, it is in a position to contact one end of the plunger 270 mounted in the casing 242. The knob may then be moved inwardly to cause the plunger to operate the locking means 272. In the present instance, the locking means is illustrated as the latch member 274 pivoted as at 276 to the spaced lugs 278 on the casing 242 and provided with the leg 280 adapted to be contacted by the plunger, the spring 282 urging the latch against the plunger. The knob and dial are retained in assembled position by being provided with the shaft 284 which extends through the aperture 286 provided in said casing, an enlarged bore 288 being concentric with the aperture 286 and receiving the spring 290, said spring being disposed between the casing and the assembly nut 292 whereby the surface of the dial is constantly urged into contact with the ball 252.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown, which are merely by way of illustration and not limitation, as various and other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In a lock, the combination of a casing, a locking member, an axially movable and rotatable member extending through said casing and being operatively associated with said locking member, a disc associated with said rotatable member, a track member having guiding means thereon, a plurality of balls disposed between said track member and said disc and adapted to be rotated in a predetermined manner by said rotatable and track members, axial movement of said rotatable member in one direction causing said balls to move to initial starting position.

2. A lock comprising a casing, spaced stops and a shouldered portion thereon, a revoluble member oscillatably mounted in said casing having a locking member provided on one end thereof, said locking member having a stop adapted to be moved between said first named stops to limit the movement of said locking member, the opposite end of said revoluble member being recessed and having a flange overlapping said shouldered portion, a spring disposed in said recess, an operating member having a shaft extending through said revoluble member, a track member fixed to said revoluble member and having spaced depressions adjacent the center thereof, angularly disposed spaced tracks formed in said track member arranged in a predetermined sequence and position relative to each other, a second track member secured to said shaft and having a flange overlapping said first track member and extending toward said locking member, balls of different diameter disposed between said track members, said spring urging said track members toward each other, said locking member and said second track member having interengaging means adapted to be in engagement when said balls are disposed in their respective depressions to permit said locking member to be moved by said operating member, said tracks being so constructed and arranged that when the operating member is revolved in a predetermined sequence said ball will move serially into their respective depressions, but if the operating member is not moved in said sequence the balls will move outwardly of the track members to break the sequence of operation of the lock, longitudinal movement of said operating member moving the balls from any position to a predetermined initial position.

3. A lock in accordance with claim 1 wherein magnetic means is disposed to position the balls in initial starting position.

4. In a lock, the combination of a casing, a locking member, an axially movable and rotatable member extending through said casing and adapted to be operatively associated with said locking member, a disc associated with said rotatable member, a track member having guiding means thereon, a ball disposed between said track member and said disc and adapted to be rotated in a predetermined manner by said rotatable and track members, axial movement of said rotatable member in one direction causing said ball to move to initial starting position, and axial movement of said rotatable member in another direction causing operation of the locking member after said ball has been rotated in said predetermined manner.

5. A lock in accordance with claim 2 wherein means is provided to zercize the lock in addition to gravity acting on the balls.

6. A maze for a lock having magnetic means adapted to affect the movement of an associated lock member.

7. A maze for a lock having magnetic means disposed in a predetermined position.

8. A maze for a lock having track means disposed in a predetermined manner, and a magnetic member disposed in a predetermined position relative to said track means.

9. A maze for a lock having track means disposed in a predetermined manner, and positioning means disposed in a predetermined position relative to said track means.

10. A maze for a lock having spaced track means, and positioning means disposed between said spaced track means.

11. A member adapted to be embodied in a lock and constituting a portion of the control mechanism of said lock, said member having magnetic means disposed in a predetermined position.

12. A member adapted to be embodied in a lock and constituting a portion of the control mechanism of said lock, said member having positioning means for associated means of said control mechanism disposed in a predetermined position.

13. A member constituting a portion of the control mechanism of a lock having positioning means for associated means of said control mechanism disposed in a predetermined position.

14. In a lock, the combination of movable locking means, a maze member, a retaining member, movable means between said members, operating means for moving one of said members for causing predetermined movement of said movable means with respect to said maze member, said maze member having means for arresting movement of said movable means after a predetermined sequence of operation of said operating means, and means for permitting operation of said locking means after a different kind of predetermined movement of said operating means than the movement in said sequence.

15. In a lock, the combination of movable locking means, a maze member, a retaining member, movable means between said members, operating means for moving one of said members for causing predetermined movement of said movable means with respect to said maze member, said maze member having means for arresting movement of said movable means after a predetermined sequence of operation of said operating

means, and means for permitting operation of said locking means after a different kind of predetermined manual movement of said operating means than the movement in said sequence.

16. In a lock, the combination of movable locking means, operating means, a guiding member, a member spaced therefrom, means interposed between said members and movable with respect thereto, said guiding member having means for permitting movement of said last named means in a predetermined manner, spaced means for arresting movement of said interposed means and permitting movement of said locking means by said operating means.

17. In a lock, the combination of movable locking means, operating means, a guiding member, movable means movable with respect to said guiding member, said guiding member having means for permitting movement of said last named means in a predetermined manner, spaced means for affecting movement of said movable means and permitting movement of said locking means by said operating means.

18. A lock comprising a casing, spaced stops and a shouldered portion thereon, said shouldered portion having a slot in substantial alignment with one of said stops, a revoluble member oscillatably mounted in said casing having a locking member provided on one end thereof, said locking member having a stop adapted to be moved between said first named stops to limit the movement of said locking member, the opposite end of said revoluble member being recessed and having a flange overlapping said shouldered portion, said flange being provided with a notch in registration with said slot when said last named stop is in contact with one of said first named stops, a spring disposed in said recess, an operating member having a shaft extending through said revoluble member, a disc rotatably mounted on said shaft between said flange and said operating member and frictionally urged toward said operating member by said spring, said disc having a protruding member adapted to be received in said slot and notch in one position of operation, and to be received in said notch and to ride on said shouldered portion during another operation, a track member fixed to said revoluble member and having spaced ball receiving portions adjacent the center thereof, track portions forming paths formed in said track member arranged in a predetermined sequence and position relative to each other, a second track member secured to said shaft and having a flange overlapping said first track member and extending toward said locking member, a plurality of balls disposed between said track member, said spring urging said track members toward each other, said locking member and said second track member having interengaging means adapted to be in engagement when said balls are disposed in said receiving portions to permit said locking member to be moved by said operating member, said track portions being so constructed and arranged that when the operating member is revolved in a predetermined sequence said balls will move into said receiving portions, but if the operating member is not moved in said sequence the balls will move to break the sequence of operation of the lock, longitudinal movement of said operating member moving the balls from any position to predetermined initial positions.

19. A lock comprising a casing, spaced stops and a shouldered portion thereon, a revoluble member oscillatably mounted in said casing having a locking member provided on one end thereof, said locking member having a stop adapted to be moved between said first named stops to limit the movement of said locking member, an operating member having a shaft extending through said revoluble member, a track member fixed to said revoluble member and having ball receiving portions adjacent the center thereof, track portions forming paths provided on said track member arranged in a predetermined sequence and position relative to each other, a second track member secured to said shaft and having a flange overlapping said first track member and extending toward said locking member, balls disposed between said track members, said locking member and said second track member having interengaging means adapted to be in engagement when said balls are disposed in said receiving portions to permit said locking member to be moved by said operating member, said track portions being so constructed and arranged that when the operating member is revolved in a predetermined sequence said balls will move into said receiving portions, but if the operating member is not moved in said sequence the balls will move to break the sequence of operation of the lock, longitudinal movement of said operating member moving the balls from any position to predetermined initial positions.

20. A lock comprising a casing, a locking member, a first track member thereon, a second track member spaced from said first track member and having rotating means therefor, separating means including a plurality of members disposed between said track members, receiving means for receiving said separating means for permitting said rotating means to move said locking member, means for causing said separating means to be frictionally held between said track members whereby they will be moved in a predetermined path on said tracks, and directing means for directing movement of said separating means with respect to said receiving means according to a predetermined operation of said rotating means.

21. A lock comprising a casing, a locking member, a first track member thereon, a second track member spaced from said first track member and having rotating means therefor, separating means including a plurality of members disposed between said track members, receiving means for receiving said separating means for permitting said rotating means to move said locking member, means for causing said separating means to be frictionally and serially held between said track members whereby they will be moved serially in a predetermined path on said tracks, one of the members of said separating means being movable after another of said members has been received in said receiving means, and directing means for directing movement of said separating means with respect to said receiving means according to a predetermined operation of said rotating means.

22. In a lock, the combination of locking means, operating means, means adapted to be conditioned by said operating means to provide an operative connection between said operating means and said locking means, and means cooperating with one of said first named means whereby secondary movement of said operating means is necessary to operate said locking means.

23. In a lock, the combination of locking means, operating means, operative means disposed between said locking means and operating means

adapted to be conditioned to provide an operative connection between said operating means and said locking means, said operative means including means movable in a predetermined sequence to establish said connection, and means cooperating with one of said first named means whereby secondary movement of said operating means is necessary to operate said locking means.

24. In a lock, the combination of a movable locking member, operating means adapted to move said locking member, operating mechanism interposed between said locking member and said operating means, said mechanism including a pair of relatively movable track members, movement of one of said members being controlled by said operating means, track means for one of said track members providing a predetermined path, means movable during relative movement of said track members according to said predetermined path, and means adapted to be moved by said last named means when said last named means has been moved to a predetermined position along said path and cooperating with said locking member to permit operation of said locking member by said operating means.

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