UNIVERSAL STATES PATENT OFFICE.

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COMBINATION LOCKING MECHANISM.


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To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERG, a citizen of the United States, and a resident of Lake Placid, in the county of Essex and State of New York, have invented a new and Improved Combination Locking Mechanism, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in combination locks for boxes or other containers, and more particularly to that form of lock in which the two sections or parts, for instance, the box and cover, are rotatable in respect to each other, to operate the lock.

In my improved locking mechanism, I employ one or more locking members, preferably in the form of rings and revolving in respect to one member, and a retaining catch or projection carried by the other section and serving not only to rotate the ring or rings upon the relative rotation of the box sections, but also serving to prevent the opening of the box, save when the sections and rings are in predetermined relative positions.

One of the main objects of my invention is to so construct this retaining catch or projection that the box may be closed irrespectively of the position of the retaining rings.

This I accomplish by resiliently mounting the catch, so that it may slip past the rings in closing the box but is prevented from moving back past them in the opposite direction save when the rings are in predetermined relative positions.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a perspective view of a box and its cover constructed in accordance with my invention and in the position occupied immediately after the opening of the box; and Fig. 2 is a top plan view of a box, the cover being removed and a portion of the box being broken away; and Fig. 3 is a developed section on the line 3—3 of Fig. 2.

My improved box is formed of two sections, telescopic to a limited extent and the telescoping portions are spaced apart to leave an annular chamber or passage 12 therebetwen. As illustrated, the box is provided with a reduced neck portion 13, and the cover in the form of a cap with a depending flange 14 for receiving and inclosing the neck portion 13. The annular chamber or passage 12 is formed between the neck portion 13 and the flange 14. Within this annular chamber, one of the sections carries a plurality of tumbler rings revolveable in respect to the section but held from longitudinal movement in respect thereto.

It is evident that the rings may be carried by either section, but they are preferably carried by the neck portion 13 of the box. As shown, I provide four rings 15, 16, 17 and 18, lying closely adjacent each other and held from longitudinal movement in one direction by a shoulder 19 on the box neck, and held from movement in the opposite direction by a collar or ring 20 constituting an annular flange at the mouth of the box, and also serving as a tumbler ring. Certain of the rings are fixed and certain other of the rings are rotatable, and each and all of the rings have one or more notches or openings 21 therethrough, which, when brought into registry, permit the opening of the box. Preferably, the alternate rings, for instance, the rings 15, 17 and 20, are held rigid in respect to the neck, while the remaining alternate rings 16 and 18 are rotatable. The rings 15, 17 and 20 have their openings 21 permanently in registry with each other, while the openings 21 in the rings 16 and 18 may each be brought into registry with the openings 21 in the other rings independently of each other. In Fig. 1, I have illustrated all of the openings 21 in registry with each other. The other section of the box, that is, the cover, is provided with a retaining catch or projection 22 which engages with the under side of the lower ring 15 to normally lock the cover in position but which may be moved through a series of openings 21 when said openings are in alignment, to permit the opening of the box. This retaining catch is in the form of a spring having its upper end secured to the cover and having its lower end free to move inward or outward radially. The
lower end of the catch is normally in the position indicated in Fig. 3, that is, it engages with the under side of the ring 15 to prevent the opening of the box, but when the cover is removed it may be replaced on the box irrespective of any predetermined position of the tumbler rings or openings therein. The catch 22 presents an upwardly and inwardly-extending cam surface 23, such that when the cover is placed over the neck of the box and pressed downwardly, said catch 22 springs outwardly and the cover snaps into position by the end of the projection slipping over the outer edges of the several rings. The box may thus be closed without any regard whatsoever for the position of the openings, but it cannot be opened unless the openings 21 are all in registry. The catch 22 thus operates as a spring bolt.

The catch 22 constitutes not only the bolt of the lock, but it also operates as the means for bringing the movable rings 16 and 18 to the desired position by a predetermined relative rotation of the two sections of the box. The tumbler ring 16 is provided with a lug 24 which extends inwardly and downwardly to a position beneath the under side of the stationary ring 15, and in the path of the end of the catch 22. Thus, as the two sections of the box are rotated relatively to each other, the catch 22 and the lug 24 of the tumbler ring 16 will come into engagement and the tumbler ring will be caused to rotate in respect to the box body and the openings 21 will be brought out of or into registry as the case may be. The tumbler ring 16 is provided with a second lug 25, extending upwardly past the edge of the stationary ring 17 and into a slot 26 in the periphery of the upper revoluble ring 18. The slot may be of any length desired but it is of sufficient length to give a certain amount of lost motion between the rings 16 and 18, and the ends of the slot constitute stops 27, which, when in engagement with the lug 25, cause the two rings 16 and 18 to rotate together.

The outer surfaces of the two box sections are provided with certain marks, whereby a person unfamiliar with the tumbler rings and their lugs but acquainted with the combination, may rotate the sections in the proper manner to bring all of the openings 21 into registry. For instance, one of the sections may have an arrow 28 marked thereon and the other section have a series of designating lines or marks 29 past which the two sections are rotated relatively to each other. To open the box, it is necessary to rotate the cover section 11 until the retaining lug or catch 22 comes into engagement with the lug 24, so that the ring 16 will rotate with the cover, and to then continue the rotation of the cover until the lug 25 comes into engagement with one of the stops, so that the ring 18 will also rotate with the cover. The rotation is still further continued until the opening 21 of the ring 17 is in registry with the openings in the stationary rings 15, 17 and 20. The operator of course ascertains this by his knowledge of the combination and the relative position of the arrow 28 and lines 29. The cover is then rotated in the reverse direction through approximately one complete revolution to bring the catch 22 in engagement with the opposite side of the lug 24, and a continued rotation of the cover moves the ring 16 independently of the ring 18, until the opening of the former is in registry with the opening in the latter. The direction of rotation of the cover is again reversed and the rotation continued until the catch 22 is brought opposite the series of registering openings and the box opened.

I have so far referred to only one retainingcatch 22 and one series of registering openings 21, but it is of course evident that a second series of openings and a second retaining catch 30 may be employed. The second series of openings are so positioned that they will be in registry when the first series are, and the second retaining catch 30 is of course so positioned as to come opposite the second series of openings when the lug or catch 22 is opposite the first-mentioned series. Preferably, the openings in one series and the corresponding retaining catch, are of greater width than the openings of the other series and its catch, so that one catch cannot be passed through the openings of the other series. The retaining catches also differ from each other in that only one of them, that is, the first-mentioned one 22, serves to engage with the lug 24 to rotate the tumbler rings. The catch 30 does not extend inwardly to quite so great a distance and does not engage with the lug 24 or in any way affect the free rotation of the cover in respect to the tumbler rings.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In combination, two separate telescoping cylindrical box sections rotatable in respect to each other, a plurality of tumbler rings intermediate the sections at their telescoping portions and carried by one section, and yielding catches carried by the other section and having engagement with said rings.

2. In combination, two separate telescoping cylindrical box sections rotatable in respect to each other, a plurality of tumbler rings intermediate the sections at their telescoping portions and carried by one section, and yielding catches carried by the other section and having engagement with said rings, said rings being movable relatively to
each other by the rotation of one section in respect to the other section.

3. In combination, two relatively revolvable, detachably associated box sections, a ring carried by one of said sections and revolvable in respect thereto, and a yielding or resilient catch carried by the other section and in engagement with said ring, said ring being revolvable in respect to its section by a predetermined rotation of one section in respect to the other.

4. In combination, two relatively revolvable, detachably associated box sections, a tumbler ring carried by one of said sections and revolvable in respect thereto and normally concealed from view within one of said sections, and means carried by the other section for normally retaining the sections in engagement with each other and also serving to rotate said tumbler ring in respect to its section.

5. In combination, two relatively revolvable, detachably associated telescoping box members, and two locking members for normally retaining said box sections in engagement with each other, one of said locking members being curved and carried by one section and movable in respect thereto, and the other of said members being carried by the other section and serving to move the first-mentioned member in respect to its section.

6. In combination, two relatively revolvable, detachably associated telescoping box members, and two locking members for normally retaining said box sections in engagement with each other and disposed between the telescoping portions of the sections and normally concealed from view, one of said locking members being curved and carried by one section and movable in respect thereto and the other of said members being carried by the other section and serving to move the first-mentioned member in respect to its section.

7. In combination, two relatively revolvable, detachably associated box sections, a plurality of tumbler rings carried by one of said sections, certain of said rings being fixed and certain other of said rings being revolvable in respect to the last-mentioned section, means carried by the other section for rotating one of said tumbler rings, and lost motion connections between said last-mentioned ring and another one of said revolvable rings.

8. In combination, two relatively revolvable, detachably associated box sections, a plurality of tumbler rings carried by one of said sections, certain of said rings being fixed and certain other of said rings being revolvable in respect to the last-mentioned section, means carried by the other section for rotating one of said tumbler rings, and lost motion connections between said last-mentioned ring and another one of said revolvable rings, said means also serving to retain said box sections in engagement with each other save when the rings and sections are in predetermined relative positions.

9. In combination, two relatively revolvable, detachably associated box sections, a plurality of tumbler rings carried by one of said sections and having openings in registry with each other when said rings are in predetermined relative positions, certain of said rings being fixed and certain other of said rings being revolvable in respect to the last-mentioned section, means carried by the other section for rotating one of said tumbler rings, and lost motion connections between said last-mentioned ring and another one of said revolvable rings.

10. In combination, two relatively revolvable, detachably associated box sections, a plurality of tumbler rings carried by one of said sections and having openings in registry with each other when said rings are in predetermined relative positions, certain of said rings being fixed and certain other of said rings being revolvable in respect to the last-mentioned section, means carried by the other section for rotating one of said tumbler rings, and lost motion connections between said last-mentioned ring and another one of said revolvable rings.

11. In combination, two relatively revolvable, detachably associated box sections, a plurality of tumbler rings carried by one of said sections, certain of said rings being fixed and certain other of said rings being revolvable in respect to the last-mentioned section, a resiliently-mounted retaining lug or projection carried by the other section for rotating one of said tumbler rings, and lost motion connections between said last-mentioned ring and another one of said revolvable rings.

12. In combination, two relatively revolvable, detachably associated sections, a plurality of retaining rings carried by one section and having a series of openings in registry with each other when said rings are in predetermined relative positions, and a retainer carried by the other section and resiliently mounted to spring past said rings in bringing the sections into engagement with each other but preventing the separation of the sections save when said openings are in registry.

13. In combination, two relatively revolvable, detachably associated sections, a plurality of retaining rings carried by one section and having a series of openings in registry with each other when said rings are in predetermined relative positions, and a retainer carried by the other section and resiliently mounted to spring past said rings in bring-
ing the sections into engagement with each other but preventing the separation of the sections save when said openings are in registry, said retainer also serving as an operating member to bring said openings into registry by a predetermined relative rotation of one section in respect to the other.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY VAN HOEVENBERG.

Witnesses:

CLAIR W. FAIRBANK,

EVERARD B. MARSHALL.