

D. W. DARIUS.  
COMBINATION LOCK.  
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1,012,991.

Patented Dec. 26, 1911.

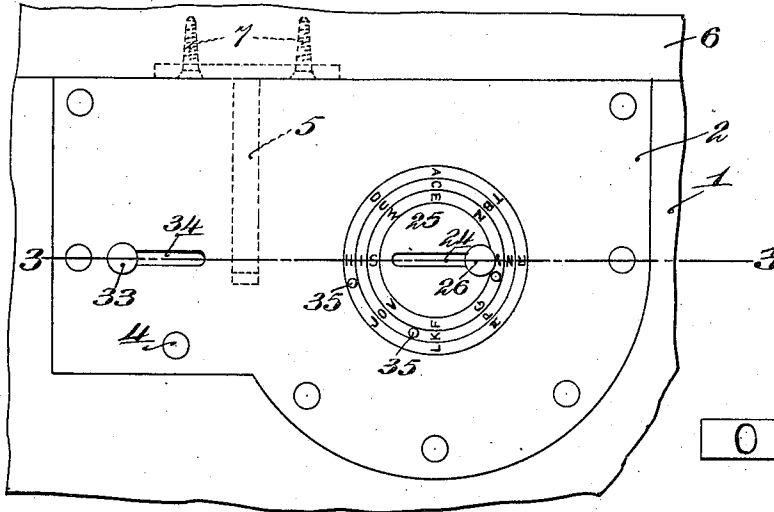


Fig. 1.

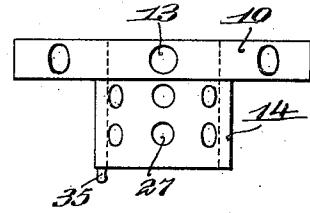


Fig. 4.

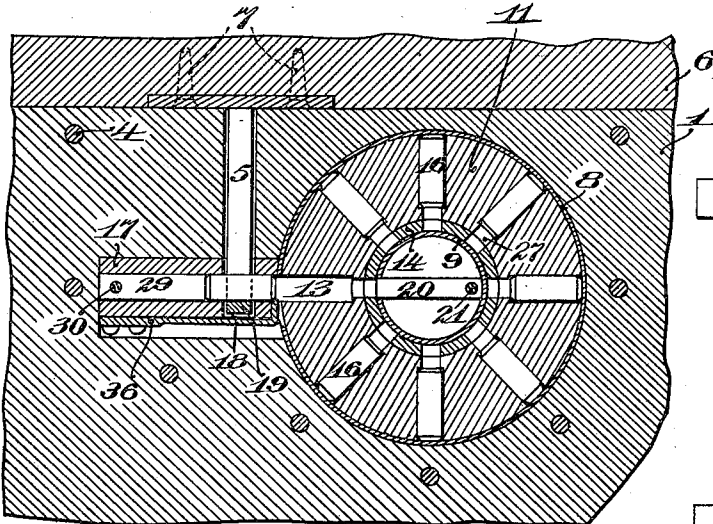


Fig. 2.

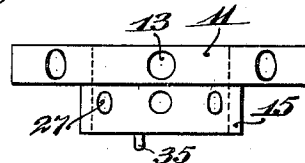


Fig. 5.

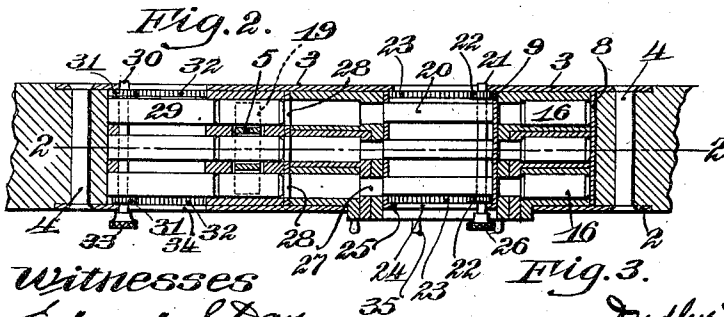


Fig. 3.

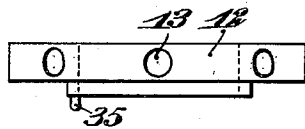


Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## COMBINATION-LOCK.

1,012,991.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, DUDLEY WILHELM DARIUS, a subject of Emperor William II of Germany, residing at Nordstrasse 9, Dresden Neustadt, Saxony, Germany, have invented certain new and useful Improvements in Combination-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to combination locks.

Combination locks have heretofore generally been constructed to operate with a single combination for which the mechanism is specially adjusted, the lock being repeatedly fastened and unfastened with this same combination. With locks of this type a new combination is available only by partially disassembling the lock and rearranging its mechanism, or by the use of some key or other instrument, both methods requiring considerable skill as well as time on the part of the person setting the lock for the new combination.

The object of the present invention is to provide a combination lock which shall be simple in construction and certain in operation and in which the combination may be varied at the pleasure of the operator without involving any more skill or labor than if the same combination is repeatedly employed.

With these objects in view the present invention consists in the lock hereafter described and more particularly defined in the claims.

In the accompanying drawings which illustrate the preferred form of the present invention yet designed for use upon trunks or similar articles, Figure 1 is a front elevation of the lock; Fig. 2 is a vertical section on line 2—2, Fig. 3; Fig. 3 is a horizontal section on line 3—3, Fig. 1; and Figs. 4, 5 and 6 show in top plan view the three carriers or disks detached from one another.

As shown in the drawings, the lock proper, which is mounted in the front of the body 1 of the trunk, is provided with front and back plates 2 and 3, respectively, the former to cover and protect the mechanism of the lock, and the latter to serve as a base or support upon which the parts are mounted, the whole being secured together and to the

body of the trunk by means of the sunken rivets 4. The staple 5, which is secured to the lid 6 of the trunk by means of the screws 7, is adapted to enter a recess in the lock proper and to be secured therein by bolts or other locking devices shortly to be described.

Rigidly secured to the back plate and projecting forwardly therefrom are the circular wall 8 and hollow hub or support 9, forming an annular chamber within which are located the three relatively rotatable disks 10, 11 and 12, respectively (see Figs. 4, 5 and 6). Each of these disks is provided with eight radial slots or recesses 13 with peripheral openings. Disk 10, which is mounted directly upon the hub 9, is provided, as shown in Fig. 4, with a hub or flange 14 and upon this hub is mounted disk 11, which in turn is provided with a hub upon which is mounted disk 12. All three disks are thus adapted to be rotated about a common axis and not only relatively to the hub 9 but also relatively to each other. Each of the recesses 13 in the three disks carries a bolt 16 and one of the eight bolts in each of the three disks is arranged to be moved out of its particular recess and into another bolt receiving recess to fasten the lock. These latter recesses are formed in the member 17, there being a recess opposite the periphery of each of the three disks. The member 17 is provided with the transverse recess 18 to receive the bar 19 at the bottom of the staple 5 when the lid of the trunk is closed, the bar at such time extending beneath the bolt receiving recesses in the member 17 so that if bolts are forced from the disks into these recesses the lock will be fastened.

The means for moving the bolts out of their recesses in the disks to fasten the lock comprise the slides or pins 20, the left-hand ends of which, as shown in Figs. 2 and 3, are normally supported in holes or apertures in the hub 9, the right-hand ends being supported by means of the shaft 21 which passes freely through each of these pins. This shaft carries at each end a pinion 22 meshing with the racks 23 rigidly secured at the front and back ends of the hub 9. The front end of the shaft 21 projects through the slot 24 in the circular plate 25 which closes the front of the hub and upon this end of the shaft is the milled thumb nut 26. When this nut is turned in an anti-clockwise direction, the pinions will roll

along the racks to the left, forcing the pins 20 through the holes 27 formed in the hubs of disks 10 and 11 and carrying the bolts 16 out of their recesses 13 in each of the disks 5 and through the holes 28 in the wall 8 into the recesses in the member 17. A reverse rotation of the thumb nut withdraws the pins from the recesses and brings them to their normal position as shown in Figs. 2 10 and 3. The mechanism for moving the bolts back into the recesses in the disk to unfasten the lock is of similar construction, comprising the pins 29, shaft 30, pinions 31, racks 32 and thumb nut 33 on the front end of the 15 shaft which projects through the slot 34 in the cover plate 2 of the lock.

Each disk is provided with a small knob or projection 35 upon the front edge of its hub or flange by means of which the disk 20 may be adjusted to any desired position. A series of letters or other indicating characters are also placed upon the edges of these flanges, each character on each flange indicating a particular bolt or recess in that 25 disk.

In order to prevent accidental locking or unlocking of the trunk when the latter is turned upon one end or the other a spring 36 has been provided, the upturned beveled 30 end of which prevents the bolts not only from sliding under the action of gravity out of their recesses in the disk and into those in member 17, but also movement of the bolts in the opposite direction.

The operation of the lock is as follows: 35 The lid of the trunk having been closed, thus bringing the horizontal bar 19 of the staple beneath the bolt receiving recesses in the member 17, the disks are rotated by 40 means of the knobs 35 until the desired combination of letters or symbols are brought into line at some predetermined point, say at one end or the other of the slot 24. The thumb nut 26 is then rotated 45 anti-clockwise, thus forcing one bolt from each disk into the recesses in member 17, the spring 36 yielding downwardly to a slight extent to permit the passage of the bolts and returning to its normal position 50 after the bolts have been properly seated in the recesses. Thumb nut 26 will then be rotated in the opposite direction, after which the disks may be turned to destroy the combination at which they had been set 55 when the lock was fastened. When the operator desires to unfasten the lock he must first bring the disks to the same position which they occupied when the lock was fastened and then by rotating the thumb nut 60 33 clockwise may force the bolts out of the recesses in member 17 and each into its own particular recesses in the disks. If some person unfamiliar with the combination used when the lock was fastened should at- 65 tempt to unlock the trunk, he would be un-

able to turn the thumb nut 33 to force the bolts back out of the recesses in member 17 unless the disks were first set in exactly the same position they occupied when the lock was fastened, for only when there is an 70 empty recess in each disk opposite the end of each of the bolts in member 17 can any of the bolts be moved, for all three bolts must be actuated simultaneously or not at all. 75

From the foregoing description it is obvious that since, in order to perform the locking operation, some combination must always be selected and used for the purpose 80 of bringing bolts opposite the recesses in the member 17, the combination may be changed or altered as often as desired, without requiring any more skill or time than if the same combination was kept and used indefinitely. 85

Although the present invention has been shown and described as embodied in a particular mechanism, it is not limited to such form of construction except where so specified in the claims. Furthermore, although 90 in the drawing and specification the bolts which are carried by the carriers are shown and described as constituting the fastening devices proper for the lock, the claims are not to be limited to such a construction, as 95 it is immaterial whether these bolts or similar movable devices constitute the fastening devices themselves or the actuating or controlling devices therefor.

Having thus described the present invention, 100 what is claimed is:

1. A combination lock, having, in combination, relatively movable carriers, bolts carried by the carriers, a member adapted to receive a plurality of said bolts, and means 105 for moving bolts from the carriers to the member to fasten the lock and from the member to the carriers to unfasten the lock, said means being operative to unfasten the lock only when the carriers are in the same 110 position they occupied when the lock was fastened, substantially as described.

2. A combination lock, having, in combination, a plurality of relatively movable carriers each provided with a plurality of bolt 115 receiving recesses, a member provided with bolt receiving recesses, bolts normally located in the recesses in said carriers, and means for moving the bolts into the recesses in the members to fasten the lock and 120 for moving the bolts back into the recesses in the carriers to unfasten the lock, said means being operative to unfasten the lock only when the movable carriers are in the same positions which they occupied when 125 the lock was fastened, substantially as described.

3. A combination lock, having, in combination, a plurality of rotatable disks, each provided with a plurality of recesses, a 130

member provided with a plurality of recesses, bolts normally located in the recesses in the disks, and means for moving a plurality of bolts from the recesses in the disks into the recesses in the member to fasten the lock and for moving said bolts back into the recesses in the disks to unfasten the lock, said means being operative to unfasten the lock only when the disks are in the same position which they occupied when the lock was fastened, substantially as described.

4. A combination lock, having, in combination, a plurality of rotatable disks, each provided with a plurality of radial recesses, a bolt located in each of said recesses, a member having a plurality of recesses, means for moving a bolt from each disk into the recesses in the member to fasten the lock, and means for simultaneously moving the bolts back into their respective recesses in the disks to unfasten the lock, substantially as described.

5. A combination lock, having, in combination, a plurality of rotatable disks each provided with a plurality of radial recesses, a bolt located in each of said recesses, a fixed member provided with a plurality of recesses, a slide for simultaneously moving a bolt from each disk into the recesses in the fixed member to fasten the lock, a rack

and pinion for actuating the slide, a second slide for simultaneously moving the bolts back into their respective recesses in the disks to unfasten the lock, a rack and pinion for actuating the slide, and means for preventing movement of the bolts to unfasten the lock except when actuated by the slide, substantially as described.

6. A combination lock, having, in combination, a plurality of rotatable disks each provided with a plurality of radial recesses, indicating characters on each disk to indicate the positions of the recesses, a bolt located in each of said recesses, a member having a plurality of bolt receiving recesses, a slide for moving a bolt from each disk into the bolt receiving recesses of said member to fasten the lock, and means arranged to return the bolts into their respective recesses in said disks to unfasten the lock only when the indicating characters on said disks are in the same order that they were when the lock was fastened, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

DUDLEY WILHELM DARIUS.

Witnesses:

GUIDO WOLFF,

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