D. D. ROCK.

LOCK.

APPLICATION FILED NOV. 30, 1914.

1,166,634.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

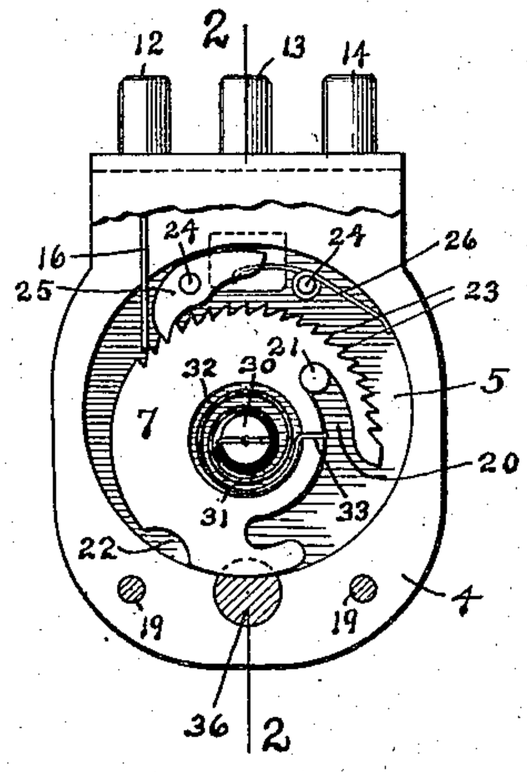


Fig. 2.

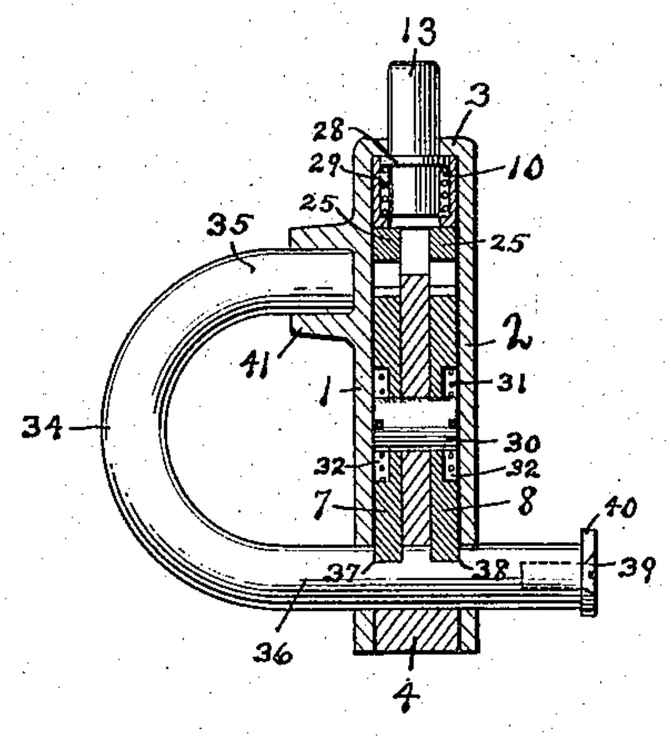


Fig. 3.

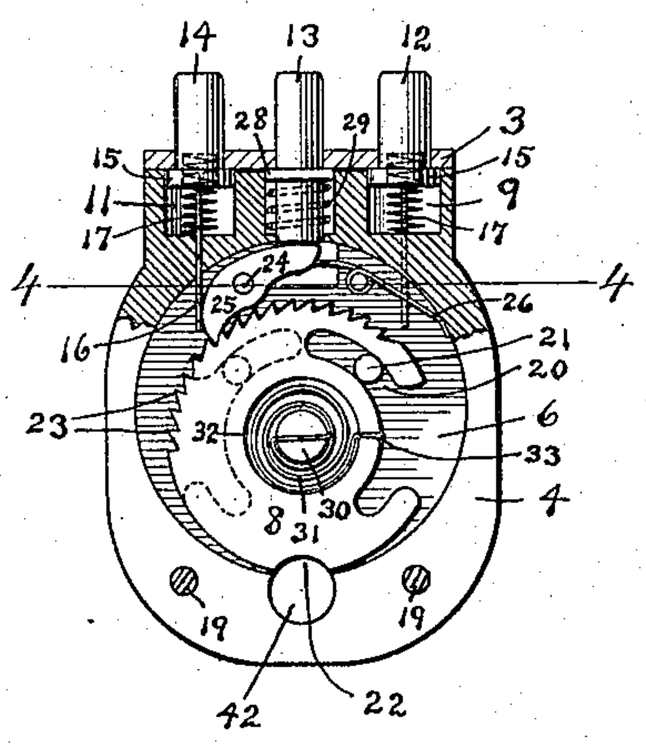


Fig. 4.

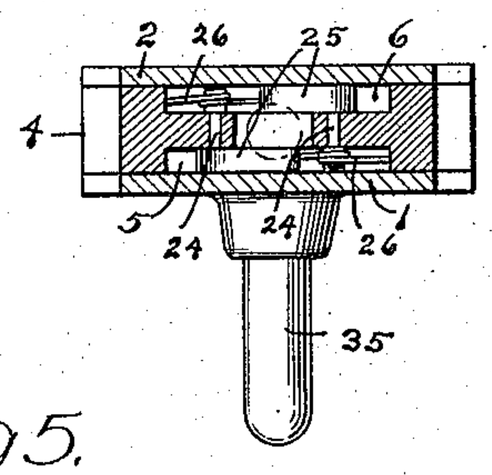
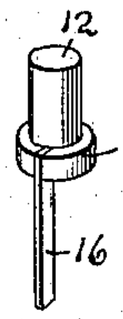


Fig. 5.



Witnesses

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2 SHEETS—SHEET 2.

Fig 6.

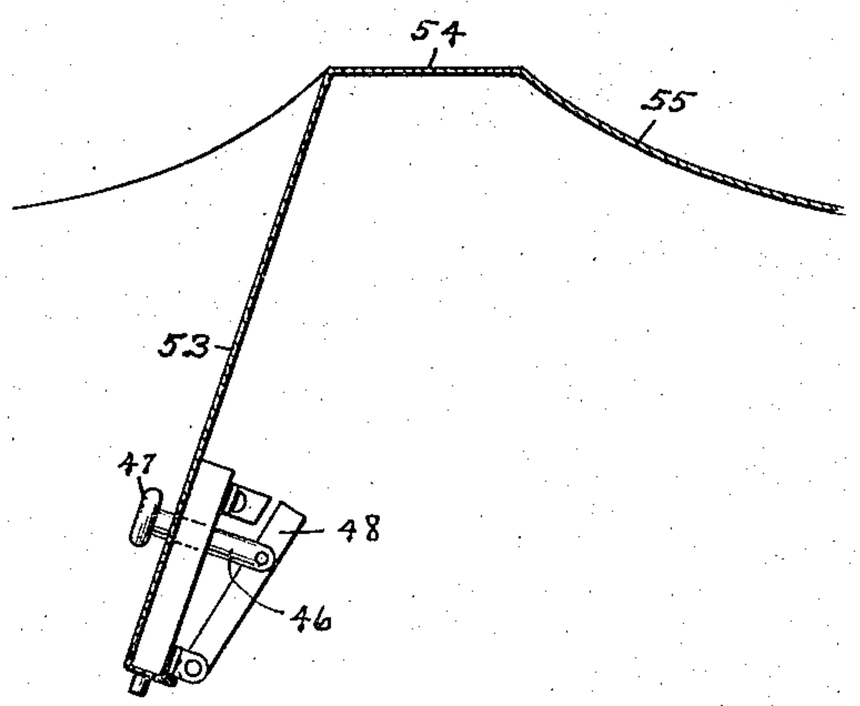
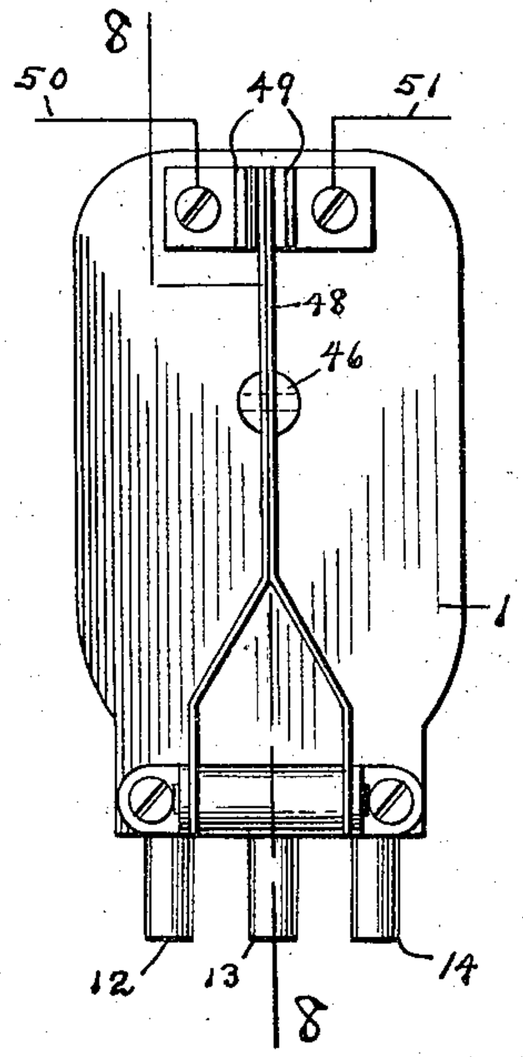
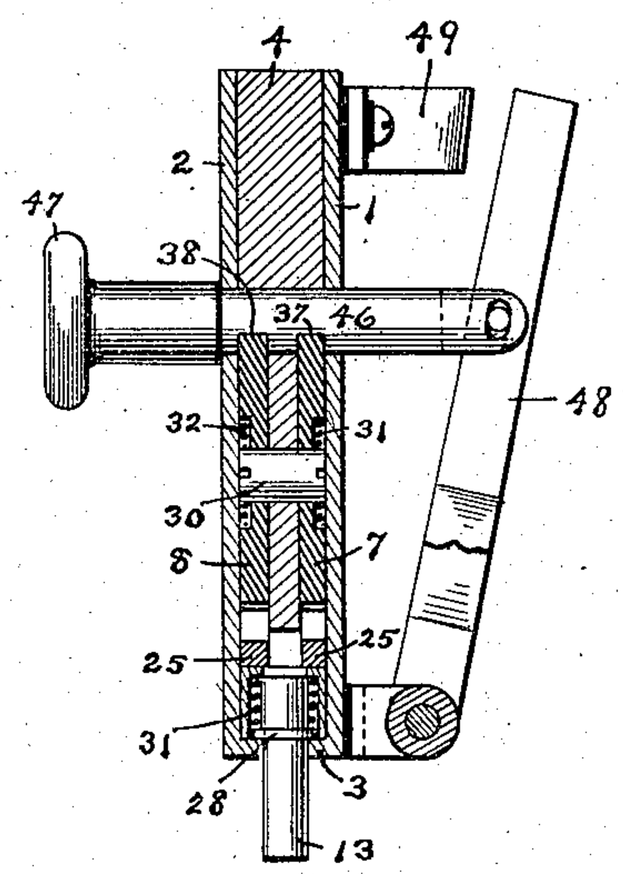


Fig. 7.

Fig. 8.





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UNITED STATES PATENT OFFICE.

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LOCK.

1,166,634. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed November 30, 1914. Serial No. 874,597.

To all whom it may concern:

Be it known that I, DARREL D. ROCK, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Lock, of which the following is a specification.

This invention relates to permutation locks especially adapted to rigidly secure a longitudinally movable bolt in position; and its object is to provide a lock which can be manipulated by the successive movements of a plurality of push-buttons, each button having a predetermined number of movements to bring a tumbler actuated thereby to releasing position.

This invention consists in combination with a case, of a bolt longitudinally movable in a hole through the case and formed with a plurality of notches, a supporting pin, a plurality of tumbler-disks mounted on the pin, each disk having a notch through which the bolt may be moved, which disks are adapted to engage in the notches in said bolt, means for turning the disks step by step in opposite directions, means for preventing the return movement of the disks, and means for releasing the disks so that they may be returned to normal position.

In the accompanying drawings Figure 1 is an elevation of one embodiment of this invention with a portion of the shell broken away. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a view similar to Fig. 1 with one side of the shell broken away together with the upper part of the central block in order to show the means for turning the tumbler-disks. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a perspective of one of the disk-operating devices. Fig. 6 is a section of the rail and instrument board of an automobile showing a modified form of this lock mounted thereon. Fig. 7 is an elevation of this modified form of lock. Fig. 8 is a section on the line 8—8 of Fig. 7.

Similar reference characters refer to like parts throughout the several views.

The body of the lock shown in Figs. 1 to 5 inclusive is formed of two parts, the outer part or shell being made up by the sides 1 and 2 connected by the top 3, preferably integral with the sides.

A block 4 fits between the sides 1 and 2 and is formed with depressions 5 and 6 in which the tumbler-disks 7 and 8 are mounted. It is also formed with parallel holes 9, 10 and 11 in a plane parallel to the sides in which holes the push-buttons 12, 13 and 14 are movable. The push-buttons 12 and 14 are alike and each has a collar 15 and a resilient metal tongue 16.

A spring 17 extends up into an opening in the bottom of each push-button 12 and 14 and forces it outwardly until the collar 15 engages the top portion 3 of the shell. It will be noticed that the resilient tongues 16 are over at one side of the center of the push-buttons, which permits the tongue 16 of the push-button 12 being in the plane of the tumbler-disk 7 while the similar tongue of the button 14 may be in the plane of the disk 8. The block 4 is slotted to receive these tongues. Small bolts or rivets 19 may be used to secure the block 4 between these sides. These disks are cut away to form paths 20 for the pins 21. They are each formed with a notch 22 and with a series of teeth 23 to be engaged by the tongues 16.

Extending through the body 4 are two pins 24 on which the pawls 25 are mounted, one pawl in each of the depressions 5 and 6, and one of them in engagement with each of the tumbler-disks 7 and 8. A spring 26 may be mounted on the opposite end of each pin 24 so as to engage the heel end of the adjacent pawl, as shown in Fig. 1.

The push-button 13 has a collar 28 and a spring 29 surrounds the lower end of this push-button and normally forces it to the position shown in Fig. 3. The inner end of this push-button is of such a size that it engages the heels of both the pawls 25 as shown in Fig. 4. If, therefore, this push-button is depressed, the outer portions of both the pawls 25 will be swung out of engagement with the teeth 23 of both of the disks 7 and 8.

A pin 30 is mounted in the block 4 and its ends extend into the depressions 5 and 6, as shown in Fig. 2, and on it the tumbler-disks are mounted. A slot is formed across each end of this pin and a spring 31 has one end extending across each of these slots and lies in a depression 32 in each of the disks 7 and 8, the opposite end of the spring lying in a small slot 33, as shown in Figs. 1 and 3. A shackle 34 having a short arm 35 and a long arm 36 is shown in Fig. 2 provided with slots 37 and 38 adapted to receive the edges of the disks 7 and 8 respectively. A screw 39 may secure the washer 40 to the end of

the long arm 36 so as to prevent the shackle from being lost. The short end of the shackle is adapted to enter the small hub 41 formed on the part 1 of the case.

It will be noticed that the distance that the disk 7 must be turned to bring its notch 22 in line with the opening 42, in which the arm 36 of the shackle is slidable, will depend upon the relative locations of the end of the slot 20 and the notch 22, as well as the location of the pin 21. Each depression of the push-button 12 will cause the tongue 16 thereof to engage a tooth 23 and move the tumbler-disk 7 one step to the left, return movement being prevented by the pawl 25. After the proper number of actuations of the push-button 12, the notch 22 will register with the hole 42 in the block 4 and sides 1 and 2. The push-button 14 may then be manipulated in order to turn the disk 8 to the proper position with its notch 22 in line with the hole 42 in the case. When the notches of the two disks are in line with the hole 42 in the case, the shackle can be moved to withdraw the end of the short arm 35 from the hub 41, which opens the lock. After the shackle has again been moved to the position shown in Fig. 2, the middle button 13 may be depressed, thus disengaging the pawl 25 from the teeth 23 of the disks 7 and 8 and permitting the springs 32 to return the two tumbler-disks to normal position. It is always desirable to depress the middle button before the buttons 12 and 14 are actuated in order to insure the disks being at the proper starting point so that the actuations may be counted.

In the modification shown in Figs. 6, 7 and 8, the invention is embodied in a switch-lock especially adapted for motor-vehicles. The plates 1 and 8 extend beyond the slidable bolt 46 a greater distance than shown in Fig. 1. A knob 47 on this bolt permits the driver of the motor-vehicle to move the bolt in and out at will, the bolt moving the blade 48 of a knife switch in and out from between the insulated contacts 49 to which the line wires 50 and 51 of the ignition system of the vehicle connect. This combined lock and switch is mounted at any convenient position on the vehicle. It is shown attached to the instrument board 53 which extends down from the usual rail 54 at the rear edge of the cowl or hood 55. It is to be understood that this particular switch forms no part of this invention and that any other available switch may be substituted therefor.

The tumbler-disks 7 and 8 will normally be in such position that their notches 22 will be in alinement with the hole 42 through the body of the lock. The bolt 46 may then be freely moved in and out to close and open the circuit of the wires 50 and 51. When, however, it is desired to open the ignition circuit so as to prevent the engine of the vehicle from running, the bolt 46 is pushed in to the position shown in Fig. 8, and the button 13 is pressed against the heels of the pawls 25, thus releasing the tumbler-disks 7 and 8 which are immediately turned into the notches 37 and 38 by the springs 31, thus locking the switch in open position. To close the switch it is necessary to depress the buttons 12 and 14 the proper number of times to again bring the notches 22 in alinement with the hole 42. It will thus be seen that this switch is positively locked in open position by the depression of the button 13, and that the "combination" of the lock depends entirely on the number of steps necessary to aline the notches 22 with the hole 42, which also depends on the lengths of the slots 20 and the positions of the pins 21.

Many changes in the details of construction and the proportions of the parts can be made by skilled lock-makers without departing from the spirit of my invention.

I claim:—

1. In a lock, the combination of a flat body having a transverse passage, two tumbler-disks revolubly mounted therein, each having peripheral teeth and a notch, a pin on which both of the disks are mounted, push-buttons for said disks mounted parallel to each other and to the disks in one edge of the body, a tongue on each push-button adapted to engage the peripheral teeth of one of the disks to turn the same step by step, a spring for each disk to return it to normal position, a pawl to prevent the return movement of each disk, a push-button in line with the other two adapted to engage the pawls to release the disks, and a bolt movable in the transverse passage when the notches in the disks are in alinement therewith, said bolt having transverse notches into which the edges of the disks extend when the notches are out of alinement with said passage.

2. In a lock, the combination of a body having a transverse passage, a bolt slidable in the passage and having transverse notches, a pin within the body, a plurality of flat tumbler disks mounted on the pin and each having a notch through which said bolt is slidable, a push-button adapted to turn one disk step-by-step until its notch is in alinement with the passage, and a second push-button adapted to turn the other disk step-by-step in the opposite direction from the first until its notch is also in alinement with said passage, and means to return the disks into the notches in the bolt.

3. In a lock, the combination of a body having a transverse passage, a bolt slidable in the passage and having transverse notches, a pin within the body, a plurality of flat tumbler disks mounted on the pin and each having a notch through which said bolt

is slidable, a push-button adapted to turn one disk step-by-step until its notch is in alinement with the passage, and a second push-button adapted to turn the other disk step-by-step in the opposite direction from the first until its notch is also in alinement with said passage, means to return the disks into the notches in the bolt, pawls for preventing the return movement of the disks, and independently operable means for disengaging said pawls.

4. In a lock, the combination of a body having a transverse passage, a bolt slidable in the passage and having transverse notches, a pin within the body, a plurality of flat tumbler disks mounted on the pin and each having a notch through which said bolt is slidable, a push-button adapted to turn one disk step-by-step until its notch is in alinement with the passage, and a second push-button adapted to turn the other disk step-by-step in the opposite direction from the first until its notch is also in alinement with said passage, means to return the disks into the notches in the bolt, pawls for preventing the return movement of the disks, and a push-button mounted between the other two and operable independent thereof for disengaging said pawls.

5. In a lock, the combination of a body having a transverse passage, a bolt slidable in the passage and having transverse notches, a plurality of disks revolubly mounted in said body in alinement with each other and each having a notch through which the bolt is slidable, and a series of teeth in its outer edge, a push-button provided with a flexible tongue adapted to engage in the teeth of one disk to turn the disk step-by-step until its notch is in alinement with said passage, and a second push-button provided with a flexible tongue adapted to turn the other disk step-by-step in the opposite direction until its notch is also in alinement with said passage, and means to turn the disks into the notches in the bolt.

6. In a lock, the combination of a body having a transverse passage, a bolt slidable in the passage and having transverse notches, two flat disks revolubly mounted within the body and provided with notches through which the bolt is slidable, means for independently turning the disks step-by-step in opposite directions until the notches in the disks are in alinement with said passage, and means to turn the disks into the notches in the bolt.

In testimony whereof I sign this specification in the presence of two subscribing witnesses.

DARREL D. ROCK.

Witnesses:
EDWARD N. PAGELSEN,
HUGO W. KREINBRING.