To whom it may concern:

Be it known that I, Theodore Barnes, a citizen of the United States, residing at Chariton, in the county of Lucas and State of Iowa, have invented certain new and useful Improvements in Permutation-Locks for Electric Switches, of which the following is a specification.

My invention relates to improvements in permutation locks, adapted for use in connection with operating electric switches, while not necessarily restricted to such use.

An important object of the invention is to provide a device of the above mentioned character, which is compact in the arrangement of its parts, neat in appearance, and convenient to operate, when the combination is known, but exceedingly difficult to operate without the knowledge of the combination.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side elevation of a device embodying the invention,

Fig. 2 is a central longitudinal sectional view through the same.

Fig. 3 is an end elevation of a locking disk or tumbler, and,

Fig. 4 is a side elevation of the same.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates the body portion or housing, as a whole. This housing comprises an inner shell 6, which is interiorly screw-threaded. The numeral 9 designates the coating part of the housing, which is provided with a flange 10. The annular flange 10 is exteriorly screw-threaded for engagement with the flange 8, as shown. The member 9 is adapted to be attached to a support 11, which may be the dash of an automobile, by means of screws or bolts 12.

The numeral 13 designates a stationary inner cylindrical tube, the outer end of which is covered by a head or cap 14. The stationary tube 13 projects into the housing and is provided with an outwardly extending annular flange 15. This flange is arranged between the flanges 10 and 7, and is adapted to be clamped therebetween. Arranged upon the stationary inner tube 13 are movable or reciprocating cylinder 10, projecting into the housing 5 and provided with an outwardly extending annular flange 17. This flange operates within the annular flange 10 and is adapted to contact with a stop flange or shoulder 18 formed upon the member 9. The member 16 is free to move longitudinally and turn upon its axis.

The numeral 21 designates a key as a whole comprising a preferably cylindrical rod or body portion 22, extending through an opening 23, in the end of the inner tube 13. The rod 22 has its forward end reduced for providing a shoulder, and this reduced end is rotatably mounted in an opening 23 in the end of the tube 16, and is held therein by means of a bolt 21, as shown.

This key is adapted to operate an electric switch, comprising a movable contact member 25, rigidly connected with and insulated from the rod 22. The contact member 25 is adapted for movement into and out of contact with and from stationary contacts 24. These stationary contacts are carried by plates 26 formed of insulating material. The plates 26 are mounted upon the flanges 7 and are secured thereto by screws 27 or the like. The stationary contacts carry binding posts 28, by means of which the contacts may be connected in series with one wire of a circuit. It is apparent that when the contact 25 is brought into contact with the stationary contacts 24 the circuit will be closed.

The combination device for controlling the operation of the switch comprises rotatable disks or tumblers 29, pivotally mounted within the inner tube 13. Each disk 29 comprises a preferably flat body portion 30, upon the periphery of which is formed an annular flange 31. The disks 29 are provided upon their flanges 32 with digits or numerals 33, which are visible through openings 33, formed in the inner and outer tubes 13 and 16, as clearly indicated in Fig. 1. Each disk is provided in its body portion 30 with a key hole opening 34, having a radial portion 34' for receiving the body portion or rod 22 and lugs or bits 35 formed thereon. These bits are spaced for providing openings therebetween, for receiving the body portion 30 of the disks 31, whereby they may rotate. The closed end 14 of the inner tube 13 is provided with a
suitable key hole opening 37, and a key hole opening 38 is formed in the stationary disk 39, which is held fixed within the tube 18, adjacent the end of the flange 6.

The operation of the device is as follows: When it is desired to close the circuit, the disks 29 are rotated or turned to bring the proper combination of digits into the central portion of the opening or openings 33.

In the present instant it is assumed that the digits or numerals 2, 5 and 7 constitute the combination. The radial portions 33' of the key hole openings 34 are all in alignment and in registration with the bits 35. The outer tube 16 is now moved toward the operator, which movement is stopped when the flange 17 contacts with the flange or shoulder 18. When the flange 17 is in the outer position the contact 25 contacts with the stationary contacts thus closing the circuit.

By rotating one or all of the disks 29, the combination is broken and the key locked in the outer position, thus retaining the circuit closed. When the disks 29 are again manipulated and the combination obtained, the tube 16 may be moved to the inner position and the contact 25 will disengage the stationary contacts and open the circuit.

Particular attention is called to the fact that the body portion of rod 22 cannot turn upon its longitudinal axis, as one lug or bit 35 is in the groove 38 of the stationary member 39 when the rod 22 is in the inner position, and another lug 35 is in the opening 38 when the rod 22 is in the outer position. By turning one or more of the disks 29 to break the combination, the key 21 is again locked in the inner position. While I have shown the switch so constructed that the circuit is closed when the tube 16 is moved toward the operator, it is obvious that by a slight change in the arrangement of the contacts the reverse operation could be readily obtained and the same is considered to be within the scope of the present invention.

It is to be understood that the form of my invention hereinafter shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a device of the character described, an inner tube, a reciprocatory tube mounted to move upon the inner tube, a rod attached to the outer tube and extending longitudinally within the inner tube and provided with spaced radially extending bits, and a plurality of locking disks rotatably mounted within the inner tube and having key hole openings for receiving the rod and the bits carried thereby.

2. In a device of the character described, a relatively stationary inner tube having an opening formed in one side thereof, a reciprocatory tube mounted to slide upon the inner tube and having an opening adapted for more or less registration with the first named opening, a rod attached to the outer tube and extending within the inner tube and provided with spaced laterally extending bits, a plurality of locking disks having key hole openings formed therein to receive the rod and its bits and provided upon their periphery with digits, and a device adapted to be operated upon the longitudinal movement of the rod in one direction.

3. In a device of the character described, a housing to be secured to a support, an inner tube having one end thereof projecting into the housing and held stationary therein, an outer tube mounted to slide upon the inner tube, a rod extending longitudinally within the inner tube and connected with the outer tube for movement therewith and provided with laterally extending bits, disks rotatably mounted within the inner tube and having key hole openings formed therein to receive the rod and its bits, and a device arranged within the housing and adapted to be operated upon the movement of the rod in one direction.

4. In a device of the character described, a housing to be secured to a support and provided with a forwardly arranged interior stop member, an inner tube having one end thereof projecting into the housing and held therein, an outer tube mounted to slide longitudinally upon the inner tube and having one end thereof projecting into the housing and provided with a stop member to contact with the first named stop member to limit the outward movement of the outer tube, a rod attached to the outer tube and extending longitudinally within the inner tube and provided with spaced radially extending bits, and a plurality of disks rotatably mounted within the inner tube and having key hole openings for receiving the rod and its bits carried thereby.

5. In a device of the character described, a stationary casing, a co-acting casing held within the stationary casing and provided at its outer end with an interior flange, an inner tube having one end disposed within the stationary casing and provided with a flange which is held against displacement by the said co-acting casing, an outer tube mounted to slide longitudinally upon the inner tube and having one end thereof extending into the co-acting casing and provided with an exterior flange disposed between the flange of the inner tube and the flange of the co-acting casing, a rod attached to the outer tube and extending longitudinally within the inner tube and provided with spaced radially extending bits, and a plurality of...
In a device of the character described, a relatively stationary housing, a longitudinally movable rod extending through the housing and provided with spaced laterally extending bits which are spaced longitudinally of the rod, rotatable disks arranged within the housing and having key-hole openings for receiving the rods and the bits carried thereby, and a relatively stationary member connected with the housing and having a key-hole opening to receive the rod and certain of the bits carried thereby and so positioned that one bit is at all times within the key-hole opening thereof whereby the rod is held against turning upon its longitudinal axis.

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

THEODORE BARNES.

Witnesses:
J. H. COLLINS,
J. S. MILLER.