

J. W. ESTES.
PERMUTATION LOCK.
APPLICATION FILED OCT. 13, 1908.

933,968.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

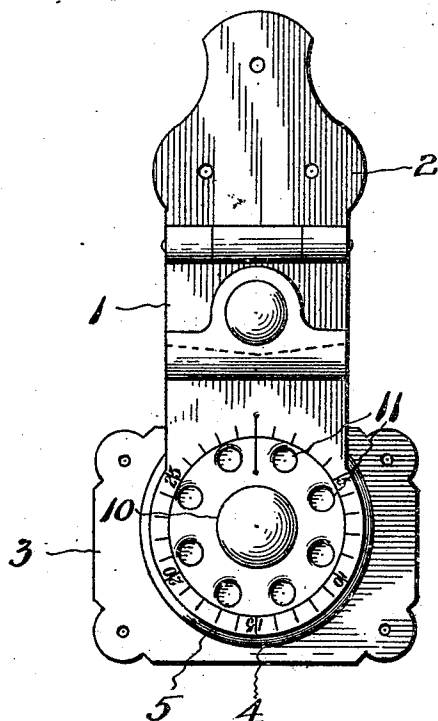


Fig. 2.

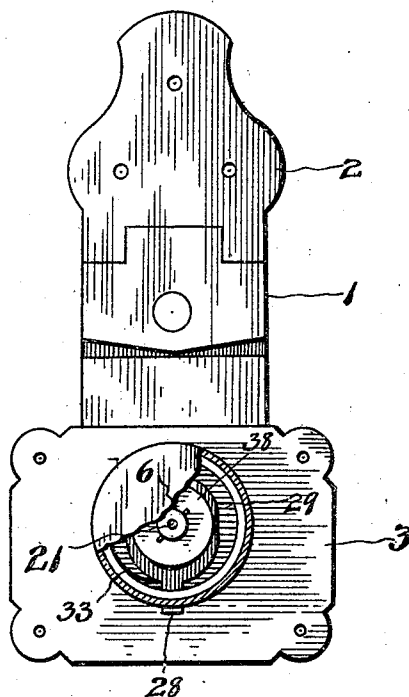


Fig. 3.

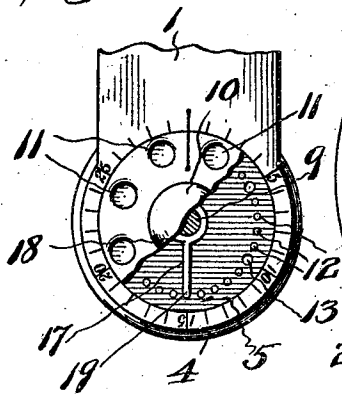
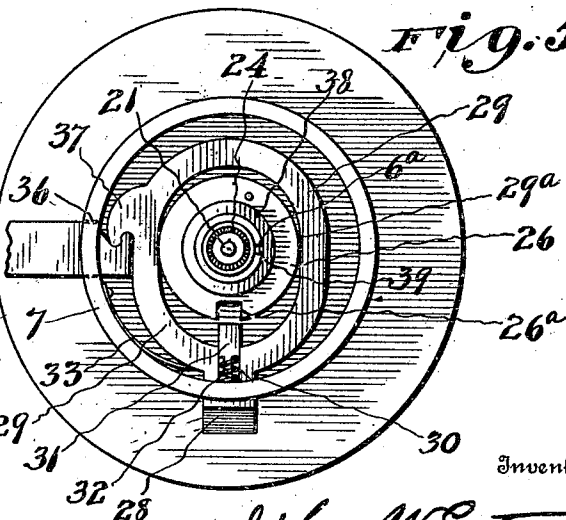


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

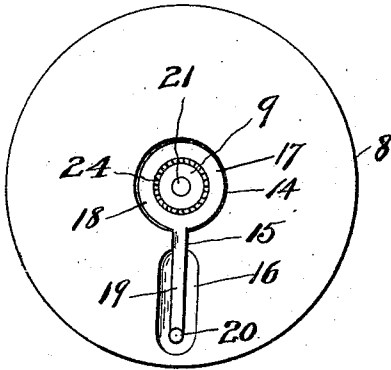


Fig. 7.

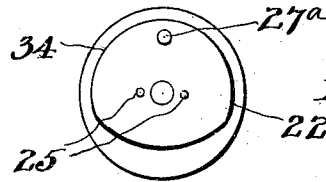


Fig. 9.

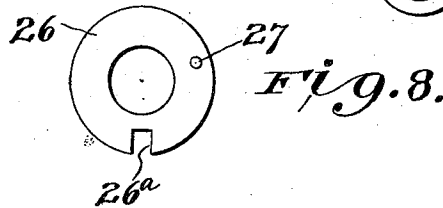
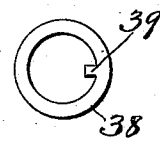


Fig. 10.

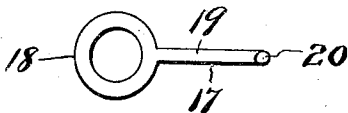


Fig. 11.

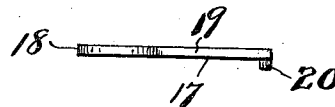


Fig. 12.

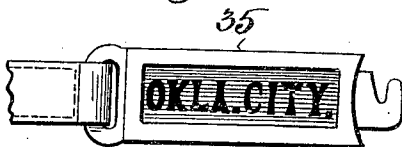


Fig. 13.

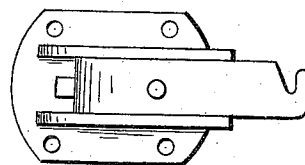
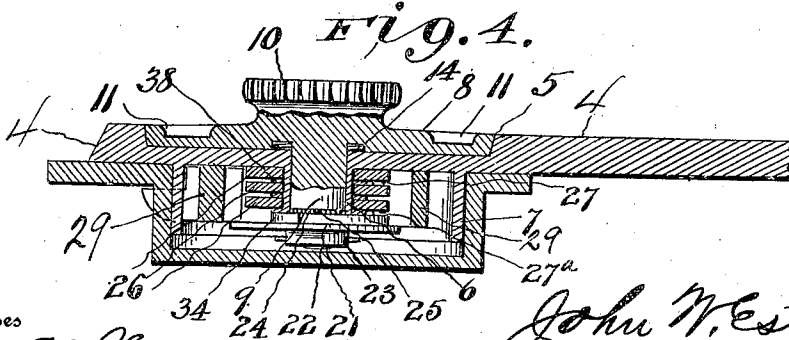


Fig. 4.



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PERMUTATION-LOCK.

933,968.

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To all whom it may concern:

Be it known that I, JOHN W. ESTES, a citizen of the United States, residing at Oklahoma city, in the county and State of Oklahoma, have invented certain new and useful Improvements in Permutation-Locks, of which the following is a specification.

My invention relates to permutation locks for safes, doors, drawers, trunks and similar structures and has for its object the provision of a lock that is reasonable in cost of manufacture, effective in operation, and that is provided with an indicating device to assist in its manipulation at night.

The construction and operation of my improved lock will be described in detail hereinafter and illustrated in the accompanying drawings in which—

Figure 1 is a front view in elevation of a trunk lock embodying my improvements, Fig. 2, is a rear view partly broken away, Fig. 3, a fragmental front view partly broken away, Fig. 4, a cross section of the lock and casing, Fig. 5, a rear view of the interior of the lock on an enlarged scale having the tumbler plate removed and showing its adaptation to use to lock doors, drawers, etc., Fig. 6, a view of the inner side of the revoluble dial plate, Fig. 7, a detail view of the tumbler plate, Fig. 8, a detail view of one of the tumblers, Fig. 9, a view of one of the separating washers, Figs. 10 and 11, plan and side views of the spring key, Fig. 12, a front view of a hasp such as is ordinarily used on mail pouches, and Fig. 13 a rear view of a hasp to be used for furniture doors.

In the drawings similar reference characters indicate corresponding parts in all of the views.

In Figs. 1, 2, 3 and 4 my improved lock is shown applied to a structure for locking chests or trunks in which it is applied to the usual strap 1 hinged to plate 2 that is secured to the body or lid of the trunk or chest (not shown) and coacts with the locking plate 3 secured to the other part.

The lock consists essentially of a plate 4 having a circular depression 5 therein with a central tubular arbor or spindle 6 and a concentric flange 7 extending from its rear side. Plate 4 is provided around the edge of depression 5 with the usual scale for assisting in manipulating the lock in unlocking it.

8 indicates the dial plate revolubly mounted in depression 5 and having a stem 9 engag-

ing the tubular spindle or arbor 6 and a knob 10 on its top to turn the plate, and provided with a roughened or milled edge, as shown, while the plate is provided with a number of depressions 11 to receive the ends of the fingers and thumb to enable the knob to be more easily grasped and the dial turned.

In order that the lock may be operated in the dark I provide a series of notches in the bottom of depression 5, small and comparatively shallow notches 12 being varied by deeper notches 13 at intervals such as five and multiples of five, while the rear side of the dial plate is formed with a circular depression 14 surrounding stem 9 and a communicating radial depression 15 having its outer portion enlarged as shown at 16, said depressions 14, 15 and 16 being formed to receive a spring key 17 having an eye loop 18 at one end to seat in depression 14 and a stem 19 to engage depressions 15 and 16, the outer end of stem 19 having its end bent at an angle thereto as shown at 20 to engage notches 12 and 13.

It will be understood from the structure described that when the dial plate 8 is rotated the angular portion 20 of key 17 engages notches 12 and 13, so that the operator can tell by the clicking of the key into the notches the position of the dial plate, the deeper ones 13 holding the plate more stiffly than the shallow ones 12.

The end of stem 9 is reduced and threaded as shown at 21 to receive tumbler plate 22 that is secured in position by means of a nut 23, the shoulder formed on the stem by the reduced portion 21 being provided with teeth or notches 24 that engage pins or projections 25 on the plate to permit securing the plate in different positions on the stem so as to vary the combinations necessary to open the lock.

26 indicates the tumblers that are revolubly mounted on arbor or spindle 6 and each tumbler is provided with a lug or pin 27 on each side thereof except on the tumbler next to plate 4 which has a pin 27 on the side toward the next tumbler only, 27^a indicating a pin on tumbler plate 22 that engages the pin 27 on the adjacent tumbler.

26^a indicates notches in the edges of the tumblers 26.

28 indicates the sliding bolt having its rear end formed substantially elliptical in shape as shown at 29 with a central opening 29^a that engages the tumblers 26, said ellip-

tical portion 29 being slidably mounted between the tumbler plate 22 and plate 4.

30 indicates a slot in the rear of bolt 28 in which is slidably mounted a tooth or blade 31 propelled normally outward by means of coil spring 32.

33 indicates a leaf spring secured to flange 7 and engaging one side of elliptical portion 29 adjacent to bolt 28 that normally tends to withdraw the bolt 28 so as to unlock it.

The upper side of tumbler plate 22 is provided with a cam projection 34 that engages tooth 31 and controls its position and the position of the bolt 28.

It will be understood that by properly manipulating the dial plate 8 the tumblers 26 may be so positioned through the engagement of pins 27 and 27^a that the notches 26^a are in alinement opposite tooth or blade 31 and then by turning the tumbler plate 22 so that the narrow portion of cam projection 34 is also opposite the tooth or blade 31 the tooth or blade will enter notches 26^a and the bolt 28 will be retracted by leaf spring 33.

By turning the dial plate so that the wider portion of cam projection 34 of tumbler plate 22 engages the tooth or blade 31 the tooth or blade is forced from engagement with notches 26^a and the bolt 28 is pushed into a locking position.

35 indicates a hasp such as may be applied to a lock for mail pouches as shown in Fig. 12 or for doors, drawers, and similar structures as shown in Fig. 13 that enters through a slot 36 in flange 7 and is engaged by a hook 37 on the side of the elliptical portion.

The tumbler plate 22 and tumblers are separated by washers 38 mounted on arbor

or spindle 6 having inwardly extending teeth 39 that engage a slot 6^a in the spindle to prevent them from turning with the tumblers. This construction prevents the tumblers from being turned by frictional contact of the pins 27 and 27^a therewith.

Having thus described my invention what I claim is—

1. In a permutation lock, the casing provided with notches, a dial plate having a stem and revolubly mounted on said notched casing, and a spring key having an eyeloop surrounding said stem and an angular end to engage the notches in the casing.

2. In a permutation lock, a casing having notches, a dial plate having a stem and revolubly mounted on said casing, the underside of said dial plate having a depression surrounding the stem and a radial depression communicating therewith, and a spring key having an eyeloop at one end seated in the depression surrounding the dial stem, the stem of the key seated in the radial depression, and the end of the key formed with an angular end to engage the notches in the casing.

3. In a permutation lock, locking members, a revoluble dial plate operatively connected to said members, said dial plate having a knob and depressions to receive the ends of the fingers when operating the plate.

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

JOHN W. ESTES.

Witnesses:

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G. W. BURROWS.