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U. PIAGNERI

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PERMUTATION LOCK

Filed Jan. 13, 1930

Fig. 1.

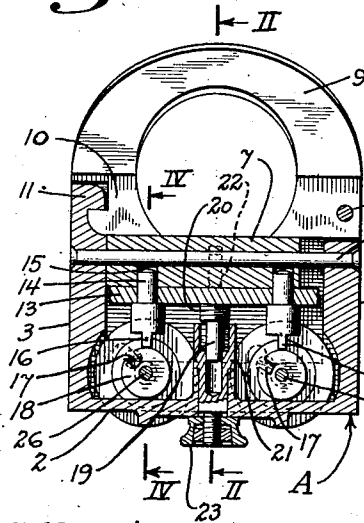


Fig. 2.

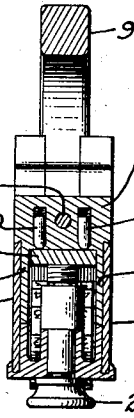


Fig. 3.

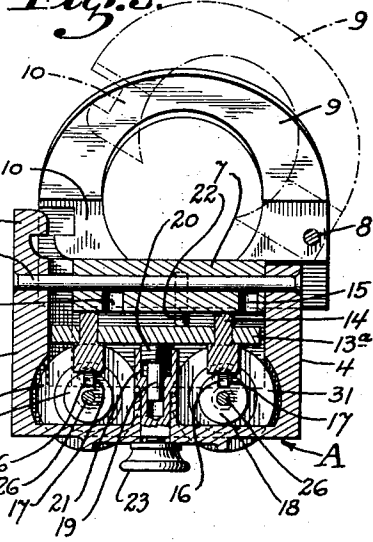


Fig. 4.

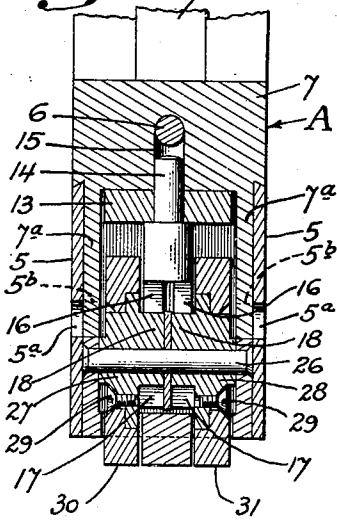


Fig. 5.

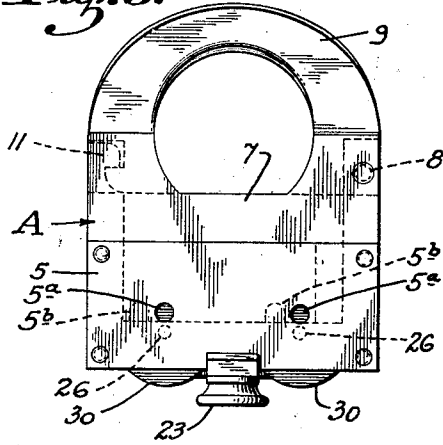


Fig. 7.

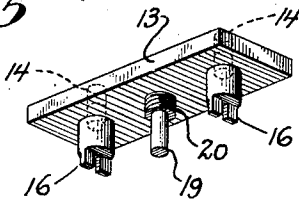
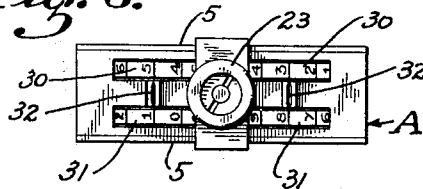


Fig. 6.



INVENTOR.
Umberto Piagneri.
BY
Lounsbury, Loftis & Abbott
ATTORNEYS.

UNITED STATES PATENT OFFICE

UMBERTO PIAGNERI, OF SAN FRANCISCO, CALIFORNIA

PERMUTATION LOCK

Application filed January 13, 1930. Serial No. 420,360.

This invention relates to locks and especially to a padlock provided with a permutation locking mechanism.

The object of the present invention is to generally improve and simplify the construction and operation of padlocks; to provide a padlock having a bolt slidably mounted on one end of the padlock housing and exterior thereof; to provide permutation actuated means for locking or releasing the bolt; and further, to provide a hasp which is pivotally attached to the bolt and movable in unison therewith to lock or release the free end of the hasp.

The padlock is shown by way of illustration in the accompanying drawings, in which—

Fig. 1 is a central vertical longitudinal section of the padlock showing the bolt and hasp in locked position.

Fig. 2 is a vertical cross section taken on line II—II of Fig. 1,

Fig. 3 is a section similar to Fig. 1 showing the bolt and the hasp in released or unlocked position,

Fig. 4 is an enlarged cross section taken on line IV—IV of Fig. 1,

Fig. 5 is a side elevation of the padlock,

Fig. 6 is a bottom view of the padlock, and

Fig. 7 is a perspective view of the locking plate.

Referring to the drawings in detail and especially Figs. 1 to 5, inclusive, A indicates in general a padlock housing provided with a bottom section, two end sections 3 and 4, and side sections 5—5. Extending longitudinally through the housing and centrally thereof and secured in the end sections 3 and 4 is a pin or bar 6 on which is slidably mounted a bolt 7. Pivotally mounted on one end of the bolt as at 8 is a hasp 9 and formed on the free end of the hasp is a latch 10 which is adapted to interlock with a keeper 11 formed on the upper end of the end section 3.

The bolt 7 and the hasp 9 normally assume the position shown in Fig. 1 where the bolt is locked against sliding movement and the hasp against pivotal movement. Means are, however, provided for releasing the bolt and the hasp so that they may assume the posi-

tion shown in Fig. 3 where the latch 10 on the hasp is out of alignment with the keeper so that the hasp may be opened or swung about its pivotal support 8. The locking mechanism employed in the present instance consists of a plate such as indicated at 13, see Figs. 1, 2, 3 and 7, in which are secured a pair of pins. These pins extend through opposite faces of the plate, the upper ends of the pins indicated at 14 normally extending into recesses 15 formed in the lower face of the bolt. The lower ends of the pins extend downwardly from the plate and are provided with lugs 16 which are adapted to register with slots 17 formed in the hubs 18 of permutation discs or wheels to be hereinafter described. The plate 13 is also provided with a downwardly extending central pin 19, the upper end of which is enlarged and threaded as at 20. The pin 19 extends into a sleeve 21 journalled in the bottom plate 2 of the lock housing and the upper end of the sleeve is enlarged and internally threaded to receive the threaded member 20. The threaded member 20 is maintained in engagement with the upper end of the sleeve at all times by means of a pair of spring pressed plungers 22 carried by the bolt and engaging the upper face of the plate 13. The lower end of the sleeve 21 is provided with a knurled head 23 whereby it may be rotated. If the knurled head is rotated in one direction sleeve 21 will be rotated in the same direction as it is secured thereto and the threaded member 20 will be engaged and plate 13 will be pulled downwardly against the sleeve 21 so as to assume the depressed position shown at 13a in Fig. 3. In this position the upper ends 14 of the pins are withdrawn from the depressions 15 in the lower face of the bolt and the bolt is thus free so that it may be moved along the rod 6 to assume the position shown in Fig. 3, thereby releasing the latch 10 with relation to the keeper 11 and permitting the hasp to be swung open about its pivot 8.

Any suitable means may be employed for locking the plate 13 against depression. Permutation actuated means are shown in the present instance and it is best illustrated in

Figs. 1, 4 and 6. Secured in the lower end of the lock housing are pins 26 and journaled thereon are the hub members 18. Adjustably secured to the hub members by means of screws 29 are discs 30 and 31. The peripheral faces of the discs are numbered as shown in Fig. 6 and certain numbers must align with pointer 32 when the slots 17 formed on the hub members 18 register with the lugs 16 formed on the lower ends of the pins. There are two pairs of discs and hub members as shown in Fig. 1, and each disc in each pair is independently rotated hence requiring that all discs are properly adjusted before the several slotted hubs align with the lugs 16. When this alignment is attained knurled nut 23 is rotated in the proper direction. The threads 20 of the pin 19 are then engaged and the plate is pulled downwardly into the depressed position shown at 13a, see Fig. 3. If it is desired to lock the hasp it is merely swung down to the position shown in Fig. 3 and the hasp and the bolt are then moved longitudinally towards the right on the rod 6 to assume the position shown in Fig. 1. Nut 23 is then rotated in the opposite direction and the plate 13 will thus be raised and pins 14 projected into the depression 15. One or all of the permutation discs are then slightly rotated so as to bring the slots 17 out of alignment with the lugs 16 and the hasp and bolt are then locked, as plate 13 together with the locking pins carried thereby cannot be retracted or depressed until the permutation discs are again properly positioned. The bolt by being mounted on the upper end of the housing has the appearance of forming a part of the lock housing and to this extent complicates the operation of opening the lock. That is, any unauthorized person even though capable of properly setting the permutation discs might not be able to open the lock as he might not discover that it would be necessary to slide the upper end of the housing before the hasp can be opened.

An important feature of the present invention is accordingly that of providing a bolt which carries the hasp and which is mounted on the upper end of the housing so as to make it appear as a part of the lock housing. Another important feature being that of providing a bolt which must be moved longitudinally and which carries the hasp so that the hasp cannot be released until the bolt has been released.

It was previously stated that the permutation discs 30 and 31 were secured to the hub members 27 and 28 by means of screws such as shown at 29. The purpose of so securing the permutation disc is to permit adjustment thereof with relation to the hub members, or in other words, changing of the permutation from time to time as conditions may demand. This change can be accomplished in the structure here shown without removal

of any parts and is accomplished as follows: Formed in the side plates 5 of the lock housing are a pair of openings such as shown at 5a, see Figs. 4 and 5, and forming a part of the sliding bolt 7 and extending downwardly therefrom are a pair of side plates 7a. These plates are also provided with notches or openings such as shown at 5b. The plates 7a move in unison with the bolt 7 when this is released and the openings 5b formed therein will register with the openings 5a when the bolt is moved to the release position shown in Fig. 3. It is then only necessary to rotate the permutation discs 30 and 31 until the heads of the screws 29 register with the openings 5a and 5b. A screw driver may then be inserted and the screws 29 slackened sufficiently to permit the discs 30 and 31 to be rotated on the hub members, thus changing the combination. If the discs have been re-adjusted the screws 29 are tightened, the sliding bolt is moved back to locking position and is there locked by unscrewing the knurled nut 23. When the sliding bolt is moved back to locking position the openings 5b in the side plates 7a have moved out of register with the openings 5a and the heads of the screws 29 are thus covered so that no unauthorized person can have access to release them or re-adjust them.

A permutation lock has accordingly been provided which permits changing of the combination or the permutation when the lock is released. Further a permutation has been provided in which the combination or permutation can not be changed except by an authorized person as it can only be changed when the lock is unlocked.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims. Similarly, that the materials and finishes of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a lock, a housing, a bolt slidably mounted on the housing transversely thereof, a hasp pivotally attached to the bolt, a latch on the free end of the hasp, a keeper on the housing which the latch normally engages, and locking means retaining the latch in engagement with the keeper, said locking means when unlocked permitting sliding movement of the bolt, the hasp and the latch away from the keeper.

2. In a lock, a housing, a bolt slidably mounted on the housing and exterior thereof, a hasp pivotally attached to the bolt, a latch on the free end of the hasp, and a keeper on the housing engageable with said latch when

the bolt and hasp assume one position and releasing the latch when the bolt and hasp are moved away from the keeper.

3. In a lock, a housing having end walls, a keeper on the housing, a bar secured between the end walls, a bolt having a limited lengthwise sliding movement on said bar, a hasp pivotally mounted on the bolt and movable in unison therewith, a latch on the free end of the hasp and engageable with the keeper on the lock housing, said latch being released with relation to the keeper when the bolt and hasp are moved on the bar away from the keeper, and means for locking the releasing bolt and hasp against sliding movement on the bar.

4. In a lock, a housing having end walls, a keeper on the housing, a bar secured between the end walls, a bolt having a limited lengthwise sliding movement on said bar, a hasp pivotally mounted on the bolt and movable in unison therewith, a latch on the free end of the hasp and engageable with the keeper on the lock housing, said latch being released with relation to the keeper when the bolt and hasp are moved on the bar away from the keeper, a plate vertically movable in the housing, said plate having a pair of pins projecting from its upper face and into recesses formed in the bolt and normally locking the bolt against sliding movement on the bar, and means for locking the plate against vertical movement to prevent retraction of the pins from the recesses of the bolt.

5. In a lock, a housing having end walls, a keeper on the housing, a bar secured between the end walls, a bolt having a limited lengthwise sliding movement on said bar, a hasp pivotally mounted on the bolt and movable in unison therewith, a latch on the free end of the hasp and engageable with the keeper on the lock housing, said latch being released with relation to the keeper when the bolt

ing the bolt against sliding movement on the bar, permutation actuated means normally maintaining the plate in raised position and the pins against retraction from the depressions in the bolt, said permutation means also adapted to be positioned to permit depression of the plate and the pins, and other means engageable with the plate to cause depression thereof in retraction of the pins from the

7. In a lock, a housing, a hasp member mounted for transverse and pivotal movement thereon, a latch on the free end of the hasp and normally engaging a keeper on the housing, said latch being released with relation to the keeper when the hasp is moved transversely on the housing, and means normally securing the hasp against transverse movement.

8. In a lock, a housing, a pair of hub members journaled therein, said hub members having recesses, locking pins movable into and out of the recesses in the hubs, a pair of permutation discs carried by the hub members, screws adjustably securing the discs to the hubs, said lock housing having openings formed therein with which the screws are adapted to align when the discs are rotated, a bolt slidably mounted in the housing and adapted to be locked or unlocked by the locking pin, and a plate carried by the bolt and closing the openings in the lock housing when the bolt is locked so as to prevent changing of the permutation discs.

9. In a lock of the character described, a lock housing, a bolt slidably mounted therein, a permutation actuated mechanism for locking or releasing the bolt, said housing having openings formed therein through which the permutation mechanism may be adjusted to change the combination of the lock, and means carried by the bolt and covering said openings when the bolt is locked to prevent the

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