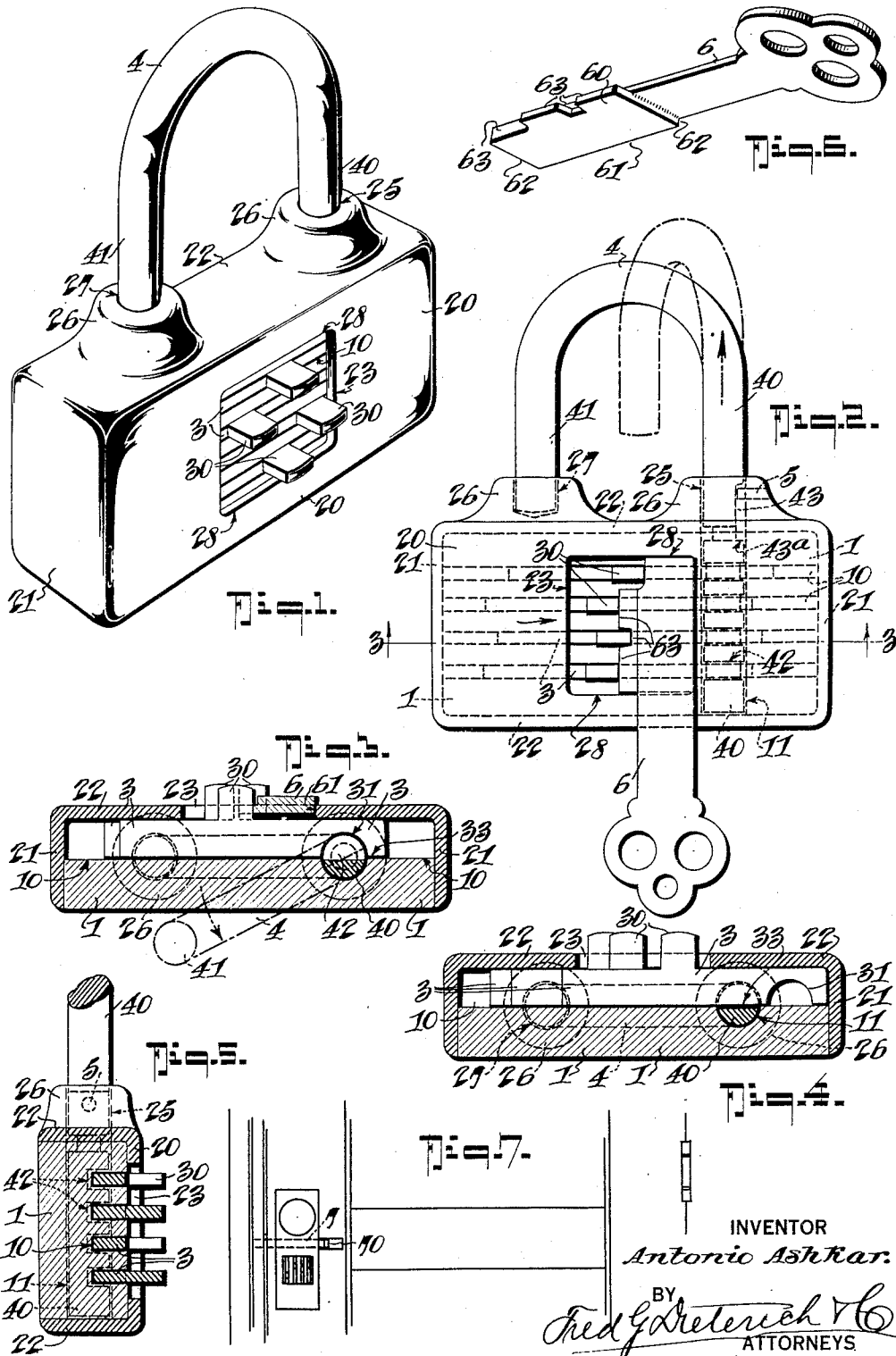


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LOCK.

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To all whom it may concern:

Be it known that I, ANTONIO ASHKAR, a subject of Syria, at present residing at Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Lock, of which the following is a specification.

My invention has for its purpose to provide a new and improved construction of a permutation type of lock, of a simple, relatively inexpensive and effective character which, while more especially adapted for use as a padlock, is capable, under immaterial modification of the parts, for being used as a door lock, safe lock, or any other form of lock in which is embodied permutation elements, and is adapted, when assembled to a predetermined combination of adjustments to provide for unlocking the shackle, bolt or other locking element.

My invention, in its generic nature, comprehends a body portion, one or more shiftable members in the nature of detents capable of being finger-manipulated from the outside of the lock body and a controlling element, in the nature of a key, adapted for being coöperatively so held in connection with the body of the lock whereby to govern the predetermined manual shifting of the detents or permutation elements, for setting the said elements to a combination that is determined by the special shape of the key-like controlling element whereby to provide for release of the locking shackle or bolt, as the case may be.

In its more complete nature, my improved construction of lock, when especially adapted for use as a shackle lock includes certain novel features to provide for holding the locking shackle against being withdrawn from the lock body or casing when released from interlocked connection with the detents or shiftable locking elements.

With other minor objects in view that will be hereinafter referred to, my improved construction of lock embodies the peculiar features of construction and novel arrangement of parts, all of which will be fully explained in the following detailed description, specifically stated in the appended claims and illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view of a padlock constructed in accordance with my in-

vention, the shackle being shown in the locked position.

Fig. 2 is a face view of the lock shown in Fig. 1 with the controlling element or key coöperatively applied to the lock body and the shiftable or permutation elements adjusted to the lock released position, the locking element or shackle being shown at the pulled out or open position in dot and dash lines.

Fig. 3 is a horizontal section of my improved lock taken on the line 3—3 of Fig. 2, and looking in the direction of the arrow, the locking element being indicated at its laterally shifted or open position in dot and dash lines.

Fig. 4 is a view similar to Fig. 3, the parts being shown as set to the locked position.

Fig. 5 is a central vertical section of the lock, the parts being shown in the shackle locking position.

Fig. 6 is a perspective view of the key that constitutes the element which controls the set or adjustment of the shiftable or detent members when shifted to the unlocked position.

Fig. 7 is a diagrammatic face view of an ordinary door lock with my improvements applied, as will hereinafter be explained.

In the practical development of my invention the body of the lock comprises a solid portion 1 and a casing or shell that includes a front face 20, vertical ends 21, that fit over the opposite ends of the body 1, and top and bottom flanges 22 which extend over the top and bottom edges of the solid body 1, as best shown in Fig. 5, the said casing and the body 1, in practice, being fixedly joined by brazing, riveting or in any other suitable manner.

The front face 20 of the casing has an elongated opening 23 and facing the said opening 23 the solid body portion 1 has a number (four being shown) of parallel horizontal grooves or channels 10 that extend the full length of the front face of the part 1, as is clearly indicated in Figs. 3 and 4 of the drawings, by reference to which and to Fig. 5, it will also be noticed that the body 1 has a vertical tubular bore 11 which extends the full height thereof and whose upper end communicates with a vertical tubular passage 25 in the top flange 22 of the casing, and a hub or enlargement 26 inte-

gral or otherwise held solid with the said top flange, and the said top flange at that end opposite the hub 26 has a similar hub 26 provided with a vertical socket 27, the purpose of which will presently be fully stated.

By referring more particularly to Figs. 3, 4 and 5, it will be observed the inner portions of the grooves 10 bisect the bore 11 and within each of the said grooves or channels 10 is slidably mounted a detent 3 and each of the said detents is endwise shiftable within its respective groove or channel 10, the shifting thereof being provided for by forming each detent with a finger-manipulated lug or extension 30 that projects through the opening 23 in the front face 20 of the casing, as shown.

The several detents or slides 3, which constitute the permutation elements hereinafter mentioned, at that end which traverses the bore 11, each have a semi-circular recess 31 formed in the inner edge thereof, which recess, when the detent is adjusted to the unlocked position, as shown in Figs. 2 and 3, registers with and constitutes a part of the bore 11, it being understood that when all of the slidable detents are adjusted to the unlocked position, as shown in full lines in Fig. 3, and by the dotted lines in Fig. 2, the long arm 40 of the shackle 4 will be free to move vertically within the said bore 11 to lift the other or locking member 41 out of the socket 27 and thereby permit swinging the said locking shackle laterally, with respect to the lock body, as shown by the dotted lines on Figs. 2 and 3.

The long arm 40 of the shackle 4 has a number (one for each permutation slide 3) of parallel annular grooves 42, through which the inner edges 33 of their respective slidable detents 3 are received when the said detents 3 are adjusted for interlockably engaging the bolt or arm 40, as is best shown in Fig. 5, it being understood that so long as any one of the slides 3 is in engagement with the bolt or arm 40, the shackle 4 is held locked against vertical movement relatively to the lock body, but when all of the slides 3 shall have been properly adjusted to bring the semi-circular notch 31 in each of the slides into register with the body bore 11, the locking arm or bolt 40 will be free to lift outwardly to release the locking arm 41 from engagement with its receiving socket 27.

In my construction of lock the locking bolt is adapted for having lift enough, when at the unlocked position, sufficient to disengage the arm 41 from the socket 27 and to that end the member 40 has a vertical elongated groove 43, the lower end 43^a of which constitutes a stop for limiting the upward lift of the shackle member 4, a stud pin 5 fixedly mounted in the hub 26 and projected into the groove 43 serving as a stop member, it

being understood that the downward thrust of the bolt or arm 40 is limited by the lower end thereof engaging with the bottom flange 22 of the casing, as shown in Figs. 2 and 5.

For setting the combination of the slides or permutation elements 3, to provide for opening the lock, as desired, a controlling element, in the nature of a key 6, is used and it includes a body having a thickened part or head 60 whose outer side edge 61 is of a length equal the height of the opening 23 in the casing front and opposite end edges 62—62 for engaging the top and bottom edges 28 of the casing opening 23, it being understood that the thickened portion 60 of the key constitutes a guide for securely holding that key or controlling element 6 in proper position during the operation of shifting the permutation members or detents 3, the adjusting of which is explained as follows:

When it is desired to unlock the lock, the operator places the controlling key 6 flatwise against the open front face of the casing in the position indicated in Fig. 2, which illustrates the head portion 60 as firmly seated against longitudinal or endwise movement by reason of the edges 61—62—62 engaging the corresponding edges of the casing opening 23.

That edge of the key head 60 opposite the edge 61, has a series of differentially related seats or abutments 63, the peculiar relation of which relatively to each other and the particular detents 3 that coengage therewith being determined by the special positioning of the notches 31 in the several detents 3.

After placing the key 6 as stated, the operator by grasping the finger extensions or lugs 31 slides the several detents 3 in the direction of the arrow on Fig. 2 until each of the detents 3 are stopped by engaging their respective abutment seats 63 on the key, (see Fig. 2,) and when thus adjusted the notches 31 in all of the detents 3, will register with the bolt bore 11 and be thereby freed from contact with the bolt member 40, which then can be lifted to the extent of its groove 43 and sufficiently to elevate the lock 41 of the shackle 4 out of the socket 27. To lock the bolt, before removing the key 6, the shackle is turned to bring its member 41 in line with its coengaging socket 27 and the said shackle is then pushed down to the locking position after which the key is removed and the said detents 3 are given a backward thrust, thereby bringing their solid inner edges across the grooves 42 in the arms 40, thus locking the said arm down, from which position it cannot be again lifted until the detents have been "key set", as before stated.

While I have especially shown my lock in a hasp or padlock form, it is to be understood the active or operative parts thereof

may be readily moved and assembled for use in connection with different types of lock in which shiftable permutation elements are included.

- 5 For example, my improved lock may be readily applied for use as a door lock by arranging the parts as generally indicated in Fig. 7, in which the bolt 7 has a head portion 70 for shifting it to the locked or
10 unlocked positions, the operation of locking the said bolt being identical to that of locking the arm 40 of the shackle 4.

From the foregoing description, taken in connection with the accompanying drawing, the complete construction, the manner
15 of use and the advantages of my lock will be apparent to those familiar with lock constructions.

- My lock, which is of the permutation
20 type, is practically a key-operated lock, since no one without the controlling element,—the key 6—, can unlock the said lock.

What I claim is:

- 25 1. In a lock of the character described, the combination with a solid body having a plurality of horizontal grooves in one face thereof and a vertical bore that bisects the said grooves, a permutation detent, one
30 for each groove, and endwise slidable in such grooves, each detent having a semi-circular recess at that end next to the vertical bore of the body and a casing that surrounds the body and engages a front having
35 an elongated opening through which the horizontal grooves and the permutation detents are exposed, each of the said detents including a lug that projects through the casing opening; of a locking bolt longitu-

dinally movable in the bore of the body, 40 the said bolt having a series of annularly disposed grooves that aline the grooves in the body, and a key having a head shaped to seat in one end of the casing opening and provided with a bearing edge having 45 differentially arranged abutments that constitute stops for the detents when moving them to their bolt releasing position.

2. A permutation lock comprising a body, a locking element insertible in the body, a 50 set of permutation elements to engage the locking element and having lugs, a key adapted to coöperate both with the body and the permutation elements' lugs to set the
55 said permutation elements to release the said locking element, the said body having an opening in one face to expose the said permutation elements, the said key having provision to seat flatwise in the said opening to hold the key in position to set the
60 said permutation elements by engagement of the lugs thereof with the key.

3. A lock comprising a body, a locking element movable within the body, permutation elements adapted under one adjust- 65 ment to interlockably engage the locking element and under another adjustment to disengage the said locking element to permit of the free movement of the said locking element and a control key adapted for
70 being applied externally and flatwise upon the body for coöperating with the permutation elements for setting the said elements to release the locking element, the said key including a handle to lie flatwise on the said
75 body and project beyond the same.

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