
PASQUALE D'ANGELO, OF NEWARK, NEW JERSEY.

Lock.

1,155,405.


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To all whom it may concern:

Be it known that I, PASQUALE D'ANGELO, a subject of the King of Italy, and a resident of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Locks, of which the following is a specification.

My invention relates to locks, and more particularly to that class of locks which cannot be unlocked by inserting and turning a key of the proper form, but it is also necessary that the key after insertion be manipulated in a predetermined manner in order to enable the unlocking action to be accomplished.

The object of the present invention is the improvement of locks of this character in numerous important respects, and with this and related objects in view, my invention consists in the parts, improvements and combinations herein set forth and claimed.

In the accompanying drawing, for the purpose of making my invention clearly understood, I have shown certain forms of padlocks in which said invention may be utilized, but it is to be understood that the invention may be applied to locks of various forms as well as to the form or forms illustrated.

In the said drawing forming a part of my specification, and in which the same reference numerals are uniformly applied to designate the same parts throughout, Figure 1 is a front view of one form of padlock in which my invention may be embodied, the front cover plate of the casing being removed to better illustrate the interior of the lock. Fig. 2 is a cross-sectional view on the line 2—2, Fig. 1, the casing being shown in place and a key being shown in this view in dotted lines. Fig. 3 is a front view of a portion of the casing cover illustrating the key-hole and adjacent indicating marks. Fig. 4 is a cross-sectional view on the line 4—4, Fig. 1, with the casing cover in place. Fig. 5 is a view similar to Fig. 1 but illustrating a modified form, and Fig. 6 is a fragmentary view also similar to Fig. 1 and illustrating a further modification.

The rear wall of the padlock casing is designated by the numeral 11. Studs 12 are provided which enter openings 13 in the front wall 14 of the casing and may be riveted over, as is customary.

The locking shackle 15 slides in openings 16 in the casing wall 11 and has one long arm 17 and one shorter arm 18, the latter being designed to extend beyond the casing when the shackle is projected, permitting the shackle to be inserted in a hasp or the like, in accordance with usual practice. A spring 19, preferably coiled about the inner end of the longer arm 17 and interposed between the bracket 20 on which the longer arm 17 rests when the shackle is retracted, and a pin or other stop member 21 on the arm 17 serve to project the shackle outwardly when not locked in retracted position. Said pin 21 may also serve as a stop to limit the outward movement of the shackle.

The arms 17 and 18 are provided with locking recesses 22 and 23, respectively, and locking levers are provided to engage with such recesses, the lever 24 being pivoted in the casing at 25 and having a dog 26 at or near one end to enter the recess 22, and having its opposite end extended to form a nose 27, and the lever 28 pivoted in the casing at 29 having a dog 30 at or near one end to enter the locking recess 23 and having its other end formed into a preferably curved extension 31. Spring means for urging both of the locking levers into locking position are provided, and the same may conveniently take the form of a spring 32 interposed between the two levers 24 and 28 and held in place by studs 33 and 34 entering the central, axial opening in the coil spring 32.

When the levers are to be operated separately and successively to unlock the shackle, as is the case with the construction shown in Figs. 1, 2 and 4, means are provided for releasably retaining one of the levers in non-locking position. In the form shown the lever which may be so retained is that marked 28, and the retaining means comprises a pivoted arm 35 which forms a catch and is pivoted in the casing at 36 and has a notch 37 for engaging a stud 38 on the lever 28 and is urged toward the stud 38 by resilient means, as the leaf spring 39.
secured in the pivoted arm 35 and pressing under the shoulder 40 on the lever 28. A lug 41 may be provided in the casing wall 10 to limit the movement of the lever 28 under the action of the spring 32. Key controlled means are provided for operating the levers 24 and 28 and the pivoted arm 35 and preferably comprise a disk 42 mounted for rotation and bodily sliding movement on a pintle 43, the spring 44 placed behind the disk 42 on the pintle tending to force it outwardly against the stop shoulder 45. With such arrangement on pushing with the key the disk can be operated in a plane back of the plane normally occupied by it.

On the rearward face of the disk 42 is a projection 46 having its outer edge preferably flush with the preferably circular periphery of the disk 42 and extending rearwardly therefrom. When the disk 42 is in forward position resting against the shoulder 45 under the influence of the spring 44, such disk may be turned freely without effecting any movement of the locking elements. When it is pushed in against the spring 44 and rotated, however, the stud 46 thereon may come into contact with the locking elements, including the levers 24 and 28 and the catch 55, and if the disk 42 is turned through a proper distance and in a proper sequence, according to the particular arrangement and disposition of the various parts, it may unlock the lever 28 from the arm 18 where such arm may be held by the pivoted arm 35 and may also operate the lever 24 by coming into contact with the end 27 thereof, whereupon the arm 17 will likewise be unlocked, permitting the shackle 15 to be moved out and under the influence of the spring 19.

Means fixed to the casing may be provided to present free rotation of the disk 42 when pushed back by the projection 46 coming in contact therewith, and in the form shown a lug 47 is fixed to the casing wall 10 for this purpose and arranged substantially midway between the inner ends of the levers 24 and 28.

With such arrangement it will be seen that as the disk 42 is rotated so that the projection 46 is opposite the space 48 between the lug 47 and the end 31 of the lever 28, and the disk is then pushed in against the spring 44 and then rotated in a clock-wise direction as the parts are shown in Fig. 1, the projection 46 will push the end 31 of the lever 28 to the left, thereby withdrawing the dog 36 from the recess 29 in the arm 13 and unlocking the arm 18 of the shackle 15. The lever 28 will be held in unlocked position by the pivoted arm 35, the stud 38 entering the cut-out 37 and the position of the parts after such movement being as indicated by dotted lines on Fig. 1.

If the rotation of the disk 42 is continued in clock-wise direction the disk still being pushed in against the spring 44, it will be seen that the stud 46 will engage the pivoted arm 35 and lift the same, thus freeing the lever 28 from such catch and permitting it again to come in locking engagement with the arm 18. If, however, the disk 42 is permitted to be pushed out by the spring 44 and is turned in lever direction after unlocking the lever 28 from the arm 18 until the stud 46 occupies the space 40, in which position it is illustrated in Fig. 1, and the disk 42 is then pushed in and turned slightly in the clock-wise direction, it will make contact with the nose 27 of the lever 24 and turn said lever in a manner to withdraw the dog 26 from the recess 22, thus completing the unlocking operation and permitting the shackle 15 to be pushed outward by the spring 19. The particular arrangement shown, of course, is by way of example only. The levers and stops on the casing and the stud on the disk may be arranged in different ways to make possible a large variety of manipulations in different locks all the same in principle but differing somewhat in form. With such arrangement, of course, the lever 28 being held out of locking position when the shackle 15 is pushed back in place, the disk 42 only will have a locking engagement therewith, and it is necessary to turn the disk 42 into such position as will free the pivoted arm 35, thus completing the locking of the second arm to the shackle by means of the lever 28. This may be accomplished by inserting the key just before the padlock is relocked and pushing it in and turning it to secure the desired result, or it may be secured by giving the key an additional push at the proper point and turning it at the time when the unlocking is done and after the shackle has been unlocked and projected by the spring 19. When this is done it is, of course, necessary for the shackle to push back the dog 30 on the lever 28, and this may be accomplished by the bevel 18' provided on the end of the shorter shackle arm 18.

The disk 42 and the key opening in the cover plate 14 are preferably formed in such manner that a key K of distinctive form is required for insertion into the lock. In the form shown the disk 42 is provided with concentric ribs 50 and 51 on its forward face, which require that the key shall have slots conforming thereto, and the cover plate 14 is provided with a rotatable member 33 whose center is in line with the center of the disk 42 and directly in front thereof, and such member is provided with slots 54 and 55 and an interior central bridge wall 56. The cover plate is also provided with a slot 57 which may be brought into line with
one of the slots 51 or 55 and form an extension thereof, thus necessitating that the key shall have a central slot for straddling the bridge wall 56. Means on the disk 42 to
cause rotation of the latter by contact of the key therewith are provided, and the same may consist of a stud 58 arranged between the ribs 50 and 51.

Markings are preferably provided on the cover plate 14 by reference whereunto the turning and pushing of the key may be gaged to secure the desired actuation, and in the form shown, numerals from 1 consecutively up to 9 and 0 are arranged in a circle upon the cover plate 14 about the member 53.
The pivoted arm 35 may be dispensed with, however, if desired, and in such case the key rotated disk is provided with two studs for simultaneously unlocking both
locking levers. In the form shown in Fig. 5 the disk 42 has two studs 60' and 61', and the disk may be placed in such position that when pushed inwardly and turned, these studs will engage and unlock the two levers 24" and 28" simultaneously. A stop piece as 47' may be arranged on the casing wall to insure with greater certainty that the lock cannot be opened except by those knowing in which position the key must be before the disk is pushed back and turned. Or, if it is desired to put out a still simpler and cheaper form of lock, such fixed stop means 47 may be entirely dispensed with, as shown in Fig. 6 where the studs 60' and 61' on the disk 42 directly engage the levers 24" and 28" when in correct position, and there is no such stop as 47' or 47" to interfere with the rotation of the disk 42' when pushed inwardly.

It will be seen that a lock constructed in accordance with my invention has numerous advantages. The shackle is held by locking dogs on each arm, and is therefore able to res sist strains which would be fatal to a lock having a locking dog or dogs applied to but one arm of the shackle, the mere possession of the key will not enable the unlocking, except by those who know the structure, the structure is simple and strong, and a lock involv ing the invention can be made and sold at low cost.

It is to be understood that my invention is as broad as my claims and that various changes may be resorted to from the precise structures I have shown and described, without departing from or sacrificing the advantages of my invention.

Having thus described my invention, I claim:

1. In a lock, a casing, a shackle adapted to slide in the casing, locking levers adapted to engage and lock each of the two shackle arms, and a catch for holding one of the levers out of locking position.

2. In a lock, a casing, a shackle adapted to slide in the casing, locking levers adapted to engage each of the two arms of the shackle and lock the same, a catch for holding one of the locking levers out of locking position, and key operated means for 70 actuating said locking levers and catch.

3. In a lock, a casing, a shackle adapted to slide in the casing, locking levers adapted to engage and lock each of the arms of the shackle, a catch for holding one of the 75 locking levers out of locking position, and rotatable key operated means normally free to be rotated freely but movable into a position to actuate said levers and catch.

4. In a lock, a casing, a shackle adapted to 80 slide in the casing, a lever pivoted in the casing and adapted at one end to engage and lock one arm of the shackle, a second lever pivoted in the casing and adapted at one end to engage and lock the other arm 85 of the shackle, a catch for holding one of the locking levers out of locking position, and key operated means adapted to engage the two levers at the ends thereof opposite the locking ends and also adapted to engage said catch and move said catch to free the locking lever engaged thereby.

5. In a lock, a casing, a shackle adapted to slide therein, a pivoted lever adapted at one end to engage and lock one arm of said 95 shackle, a second pivoted lever adapted at one end to engage and lock the second arm of the shackle, each of said levers being provided with extensions at the ends opposite the locking ends, a key operated disk, a pintle in said casing on which said disk is mounted to rotate and slide bodily, and a spring for holding said disk outwardly on said pintle, said pintle being normally freely rotatable but upon being pushed against said spring and rotated being adapted to engage either or both of the lever extensions.

6. In a lock, a casing, a shackle slideable in the casing, levers adapted to engage and lock each of the shackle arms in said casing 110 and arranged near the rear wall thereof, a pintle in said casing, a key operated disk rotatable upon said pintle and having a spring interposed to thrust it away from the rear casing wall, said disk being normally freely rotatable but adapted to engage the ends of said locking levers opposite the locking ends and actuate the same when said disk is pushed back and rotated.

7. In a lock, a casing, a shackle adapted to 120 slide in the casing, separated locking levers for each of the arms of the shackle, and a key operated disk slidably and rotatably mounted in said casing and having a stud on its back to engage the locking levers and provided with concentric ribs on its forward face.

8. In a lock, a casing, a shackle adapted
to be slid into and withdrawn from the casing, separated locking levers for each of the arms of the shackle, and a key operated disk rotatably mounted in the casing and having a stud on its back to engage the locking levers, the disk having concentric ribs on its forward face.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D.C."

In testimony that I claim the foregoing, I hereto set my hand, this 27th day of February, 1915.

PASQUALE D'ANGELO.

Witnesses:

M. A. JOHNSON,

H. TRAUTVEIT.