

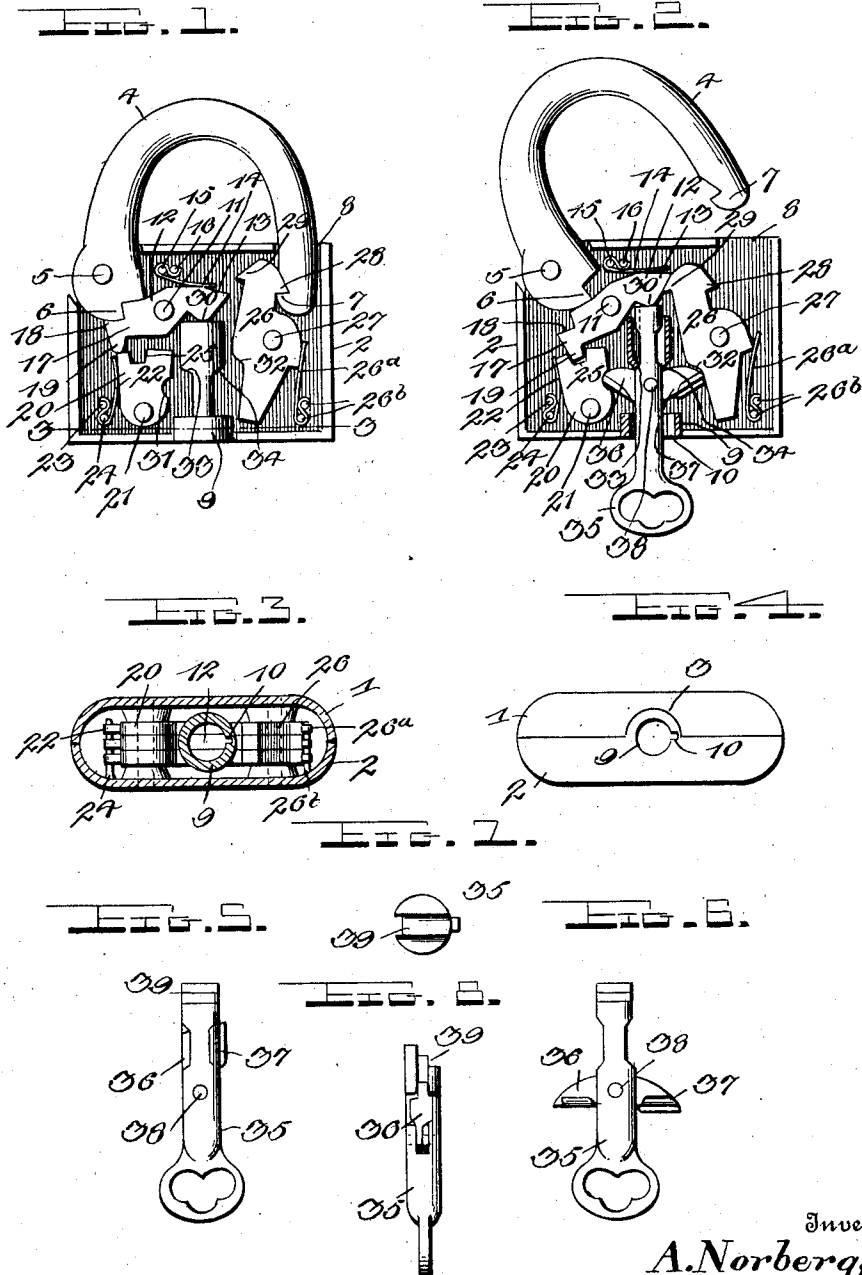
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LOCK.

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1,037,970.

Patented Sept. 10, 1912.



Witnesses

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LOCK.

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To all whom it may concern:

Be it known that I, ANDREW NORBERG, a citizen of the United States, residing at Bowbells, in the county of Burke and State of North Dakota, have invented certain new and useful Improvements in Locks, of which the following is a specification, reference being had to the accompanying drawings.

This application relates to padlocks and keys therefor and has for its object the provision of a lock and key combination which shall combine the greatest degree of security and simplicity.

The lock is one which does not readily get out of repair or adjustment, is practically proof against picking and can be manufactured at a very low cost while the key is of simple form having practically no exterior projections and yet one which with slight modification, is susceptible of a wide range of combinations taken in connection with corresponding changes of the mechanism of the lock.

The constructional features of the invention as hereinafter particularly claimed will now be described in detail in connection with the accompanying illustrative drawings wherein is shown the preferred embodiment of the same.

In the drawings; Figure 1 is a side elevation with the front plate removed showing the device in locked position; Fig. 2 is a similar view showing the unlocked position; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a bottom plan view of the lock; Fig. 5 is a detail of the key in its closed condition; Fig. 6 is a similar view showing the key in an operative open condition. Fig. 7 is an end view, upon an enlarged scale, of the key; and Fig. 8 is an edge view of the key in its closed position.

Corresponding and like parts are referred to in the following description and designated in the accompanying drawings by like reference characters.

The lock case is of any preferred shape but preferably flattened and consisting of front and rear plates 1 and 2 having abutting flanges which may interlock as shown at 3 to prevent relative displacement. The shackle 4 of the lock is pivoted at 5 and is of the usual U-shape. The pivoted end of the shackle is provided with a shoulder 6 while the free end of the same is provided with a hook 7 adapted to enter the opening 8 in the top of the case. In the lower face

of the case and preferably located entirely within one of the plates as shown in Fig. 4, is a key tube 9 having one side slotted as at 10. Within the case and below the shoulder 6 is pivotally mounted upon the stud 11, a lever 12 one arm 13 of which is yieldingly engaged by the spring 14 mounted upon the pins 15 and 16. One end 17 of this lever is provided with a nose 18 adapted to engage within the shoulder 6 of the shackle heel. Upon the same end of the lever 12 is a nose 19 which rests in the locked position upon the upper face of the lever 20 pivoted on the stud 21 and yieldingly pressed to the right by a spring 22 mounted upon the studs 23 and 24. This lever is provided in its upper face with a notch 25 adapted to receive the nose 19 in the unlocked position. A third lever 26 is pivoted upon the stud 27 and provided at its upper end with a hook 28 adapted to be engaged by the hook 7 of the shackle nose under the yielding pressure of the spring 26^a mounted on the pins 26^b while opposite the nose 28 is a hook 29 arranged immediately adjacent the arm 13 of the lever 12. The levers 12, 20 and 26 are provided with cam faces 30, 31 and 32, upon which the wards of the key are adapted to impinge for the operation of the lock. Each of the three levers 12, 20 and 26 is preferably arranged in triplicate so that in order to open the lock nine levers must be operated to the proper degree and in the proper sequence, thus affording an exceptionally wide range for combinations to avoid duplication of locks and operative keys. Within the interior of the lock case in line with the key tube are spreading members 33 and 34. These spreading members may also be arranged in triplicate, one pair in the vertical plane of the corresponding three levers.

The key which is particularly adapted to the lock above described, is shown in Figs. 5 to 8. It consists of a shank or spindle longitudinally slotted on opposite sides and having housed therein a pair of wards 36 and 37 of wing-like construction. These wards are pivoted at 38 to swing in an arc from a position within the slots, as shown in Fig. 5, to a position at right angles to the shank, as shown in Fig. 6. If the levers 12, 20 and 26 are arranged in triplicate, the pairs of wards will have faces likewise so arranged. It will be observed from Fig. 5 that while the ward 36 is housed entirely

within the slot of the shank the ward 37 projects slightly therefrom and both of the wards have a beveled end.

When the key is inserted within the key tube the spreading member 33 enters the slot in the key shank and takes under the beveled end of the ward 36 while the spreading member 34 is arranged farther to one side and takes under the inclined end of the ward 37 which projects beyond the edge of the key as shown in Fig. 5. As the key is pushed home the spreading members cause the wards to assume the position shown in Fig. 6 and the length of the wards and the relation of the cam faces on the three sets of levers is such that the ward 36 first engages with the cam face 31 of the lever 20 and swings the lever to the left until the notch 25 is in a position to receive the nose 19. The end 39 then impinges against the cam face 30 of the lever 12 and rocks the same until its nose 19 enters the notch 25 and its nose 18 clears the shoulder 6 leaving the heel free. Thereupon the ward 37 engages with the cam face 32 of the lever 26 and rocks said lever so that its nose 28 is disengaged from the hook 7 of the shackle nose resulting in the freeing of the shackle so that it can be opened by hand or automatically by a spring if such be arranged to act thereon as is common in this art.

It will be observed that very slight modifications of the cam faces, the individual levers, and corresponding changes in the faces of the individual wards of the key and in the end 39 of the same will result in a wide range of combinations which may be resorted to without duplication and which will render the lock practically proof against the operation of unauthorized persons.

Having thus described the invention what is claimed is:

1. In a lock, the combination, with a case, a shackle secured thereto and provided with a shoulder, a lever having a nose adapted to engage the shoulder, and a second lever serving in the locked position as an abutment for the first lever to hold the same in engagement with the shoulder and provided with a recess to receive the first lever in the unlocked position to permit said lever to release the shoulder, of a key having wards normally housed therein and pivotally mounted to project angularly therefrom, and means within the lock to spread the wards angularly to engage with the levers to operate the same in proper sequence to release the shackle.

2. In a lock, the combination, with a case, a shackle pivoted thereto at one end and provided at the pivoted end with a shoulder and at the free end with a hook, a lever having a nose adapted to engage the shoulder, and a second lever serving in the locked position as an abutment for the first lever to

hold the same in engagement with the shoulder and provided with a recess to receive the first lever in the unlocked position to permit said lever to release the shoulder, and a third lever having a nose to engage the hook, each of the levers having a cam face, of a key having wards normally housed therein and pivotally mounted to project angularly therefrom, and spreaders mounted in the lock and adapted to spread the wards into engagement with the faces of the levers to operate the same in a predetermined sequence to release the shackle.

3. In a lock, the combination, with a case, a shackle pivoted thereto at one end and provided at the pivoted end with a shoulder and at the free end with a hook, a lever having a nose adapted to engage the shoulder, a second lever serving in the locked position as an abutment for the first lever to hold the nose in engagement with the shoulder and provided with a recess to receive the first lever to permit the same to release the shoulder, a third lever having a nose to engage the hook, yielding means to hold the levers in the locked position, the second, first and third levers arranged to release the shackle only when operated in the order named, each of the levers provided with a cam face, of a key having wards normally housed in its shank and pivotally mounted to swing to a position at an angle thereto, and spreaders mounted within the case and adapted to spread the wards into engagement with the cam faces of the second and third levers and the end of the key adapted to engage the cam face of the first lever whereby to operate the three levers in a predetermined sequence to release the shackle.

4. A lock, including a case, a shackle connected to the case and formed at one end with a shoulder and at the other end with a hook, a lever fulcrumed in the case and engageable with the shoulder, an abutment lever independently fulcrumed in the case and engageable directly with the first named lever to hold the latter in engagement with the shoulder, another lever fulcrumed in the case and engageable with the hook of the shackle, and means insertible within the case for first moving the abutment lever to a position to release the first named lever, for subsequently moving said first named lever out of engagement with the shoulder and for subsequently moving the third named lever out of engagement with the hook.

5. A lock, including a case, a shackle connected to the case and formed at one end with a shoulder and at the other end with a hook, a lever fulcrumed in the case and engageable with the shoulder, an abutment lever to hold the latter in engagement with the shoulder, another lever fulcrumed in the case and engageable with the hook of the

shackle, and means insertible within the case for first moving the abutment lever to a position to release the first named lever, for subsequently moving said first named lever out of engagement with the shoulder, and for subsequently moving the third named lever out of engagement with the hook, and for engaging said third named lever with the first named lever.

6. A lock, including a case, a shackle pivotally mounted at one end in the case and formed at such end with a shoulder and at its free end with a hook, a lever fulcrumed in the case and engageable with said shoulder, an abutment lever fulcrumed in the case and engageable with the first named lever to hold the latter in engagement with the shoulder of the shackle, a third named lever formed in the case and engageable with the hook of the shackle, and a key insertible within the case and formed with laterally movable wards, the first named lever being disposed in line with the end of the key and the case being formed with means for automatically spreading the wards laterally upon the insertion of the key into the case, into engagement with the abutment lever and third named lever, respectively, as and for the purpose set forth.

7. A lock, including a case, a shackle pivotally mounted at one end in the case and formed at its pivoted end with a shoulder and at its free end with a hook, a horizontal extending lever mounted in said case and adapted to engage said shoulder, a key tube mounted within said case, levers mounted in the case on each side of said tube, one of the said levers adapted to hold the first mentioned lever into engagement with the

shoulder, the other said lever adapted to engage the hook of the shackle, means adapted to be inserted in said key tube for first operating the last mentioned levers whereby the first mentioned lever may be released, said means for subsequently operating the first mentioned lever and the lever engaging the hook of the shackle adapted to engage the horizontal extending lever, substantially as and for the purpose described.

8. A lock, including a case, a shackle pivotally mounted therein, a shoulder formed on the pivoted end of said shackle, a hook mounted on the free end thereof, a key tube mounted within said case, a horizontal extending lever mounted in said case and adapted to engage said shoulder, an abutment lever mounted in said case adjacent said key tube, a nose extending from said first mentioned lever and adapted to rest upon said abutment lever, a vertically extending lever mounted adjacent said key tube and adapted to engage said hook, the said abutment lever having a notch formed therein for receiving said nose, and a key insertible within said key tube for first operating said abutment lever and then operating the other said levers for moving the horizontal extending lever from said shoulder and said vertical lever from said hook, substantially as described.

In testimony whereof I hereunto affix my signature in the presence to two witnesses.

ANDREW NORBERG.

Witnesses:

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F. B. ANDREWS.