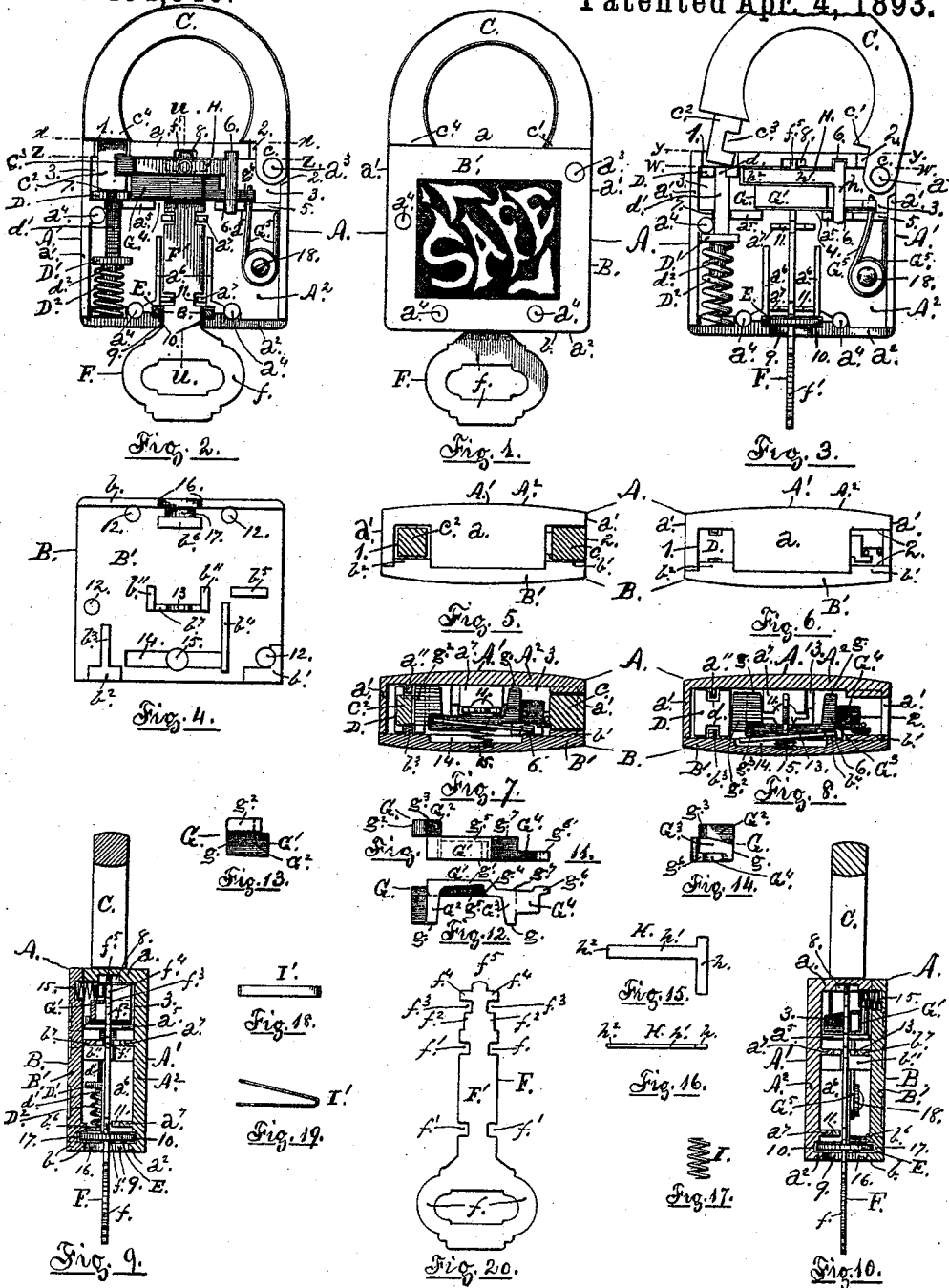


(No Model.)

J. B. AMWAKE.  
PADLOCK.

No. 494,540.

Patented Apr. 4, 1893.



Witnesses:

*S. Grant Johnston*  
*Frank S. Urban.*

Inventor

*Jacob B. Amwake,*

By

*Daniel H. Herr,*  
his attorney.

# UNITED STATES PATENT OFFICE.

JACOB B. AMWAKE, OF LANCASTER, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO DULON F. BUCHMILLER, OF SAME PLACE.

## PADLOCK.

SPECIFICATION forming part of Letters Patent No. 494,540, dated April 4, 1893.

Application filed June 14, 1892. Serial No. 436,641. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB B. AMWAKE, of Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Padlocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in a padlock of the class having a spring actuated slide-bolt to engage the free end of a pivoted shackle, a spring actuated pivoted tumbler to keep the slide-bolt in engagement with the shackle, and a rotatable key adapted to raise the tumbler and disengage the bolt from the shackle, when a spring provided for the purpose will open the lock.

The object of the invention is the production of an effective padlock, simple in construction and safe in use, that is; one that cannot be readily opened by wire picks or nails, nor by sudden jars or taps as is the case with the ordinary padlocks now known to the trade.

The particular features of the present invention are: first, the peculiar construction of the slide-bolt actuated by a wire spring to keep it in engagement with the free end of the shackle; second, applying to the bolt the forward end of a spring actuated tumbler pivoted at its rear end, to keep the bolt in engagement with the shackle; and third, the placing of both bolt and tumbler within the lock case in such a manner that they may not be readily operated or moved by any other means than by the specially constructed key.

The purposes of the invention are attained by the mechanism and devices illustrated in the accompanying drawings, in which the same letters and figures of reference designate like parts throughout the several views, and in which:

Figure 1 is a side elevation of a padlock embodying the elements of the invention. Figs. 2 and 3 are respectively similar views as in Fig. 1, the upper side plate of the case removed, showing the lock mechanism in place in closed and opened positions. Fig. 4 is a re-

versed plan of the removed plate; Fig. 5, a completed view from above, of the portion below the line  $xx$  in Fig. 2, the shackle ends appearing in cross section; Fig. 6, a similar view of the portion below the line  $yy$  in Fig. 3, the shackle ends and pivot pin removed; Fig. 7, a similar view of the portion below the line  $zz$  in Fig. 2, the shackle ends appearing again in cross section; Fig. 8, a similar view of the portion below the line  $ww$  in Fig. 3, the shackle ends and pivot pin again removed. Figs. 9 and 10 are completed sectional elevations of the portions respectively to the left and right of the line  $uu$  in Fig. 2, viewed respectively from the right and left hand, the key and circular guide disk appearing in place in full lines. Fig. 11 is a view of the slide-bolt, detached, as it appears in Fig. 2. Figs. 12, 13 and 14 are elevations, respectively, of the lower side, and of the left and right hand ends of the bolt as it is shown in Fig. 11. Figs. 15 and 16 show respectively a plan and side elevation of the pivoted tumbler detached from Fig. 2; Fig. 17, an elevation of the tumbler spring detached from its position in Fig. 2; Figs. 18 and 19, respectively, a plan and a side elevation of a V-spring that may be used instead of the spring shown in Figs. 17; and, Fig. 20, a plan of the key detached from the position shown in Fig. 2.

In the drawings A designates the lock-case in which the mechanism to be hereinafter described is placed; C, the shackle; and F, the key.

The case A comprises the chamber portion A' and the covering portion B. The chamber portion A' consists of a practically rectangular plate A<sup>2</sup> which forms a side of the case, having around its outer edge perpendicular walls of which  $a$ ,  $a'$  and  $a''$ , and  $a^3$  designate respectively, the top, the end walls, and one-half of the bottom of the case. In the top, near one angle, is an opening 1, through which the locking end of the shackle enters the case, while in the top and end, at the other angle, is an opening 2 in which the pivoted end of the shackle operates. In the opening 2 is a cylindrical pin  $a^3$  to pivot the shackle-end to the case as well as to secure the covering plate B at this point, and other pins as  $a^4$ ,  $a^4$  and  $a^4$  are adapted to secure said covering

plate to the case. In the upper portion of the case, parallel to its top, are two partition walls  $a^5$  and  $a^5$  forming a chamber 3 above to receive the slide bolt and the locking tumbler 5 to be yet described, while between the walls is an open space 4 for the passage of the key; the wall on the right is lowered at 5 to allow the free movement of the bolt spring, while in the top of its forward portion, as well as 10 opposite, in the wall  $a$ , are U-shaped recesses 6 and 6 to receive pivotally the ends of the heel-bar of the locking tumbler; and in the wall on the left is a cut-out 7 to serve as a guide for the passage of the shaft of the 15 spring actuated plunger-plate to push the shackle up. At the center of the wall  $a$ , within the case, is a recess 8 in which to rotate the forward end of the key, keeping it in place, while at the center of the semi-bottom wall  $a^2$  20 is a semicircular cut-out 9 to allow the body of the key to rotate, and just inside of this cut-out is a somewhat larger semicircular recess 10 in which to rotate the circular guide disk of the key. Extending upward from 25 this recess are parallel flanges or ribs  $a^6$  and  $a^6$  to guide the key in its passage into the lock. Between the flanges as well as above them are placed perpendicular walls  $a^7$  and  $a^7$ , having semicircular notches 11, to serve 30 as wards to engage corresponding recesses in the edges of the key. Any number of these wards may be used, and their location will be different in different locks. The portion A' and all its contained elements may be integrally made, as in one casting. 35

The covering portion B, comprising the plate B' to form the upperside of the case and the perpendicular wall  $b$  to form the other half of its bottom, is adapted to close the open 40 part of the chamber portion A'; and for this purpose the plate B' is provided with orifices 12 through which the upper ends of, the pin  $a^3$  and the pins  $a^4$ , before mentioned, being riveted thereto, serve to secure the portion B 45 in place and thus complete the case.

On the inner face of the plate B' as shown in Fig. 4,  $b^1$  is an angular boss to bear against the side of the shackle-heel in the pivot opening;  $b^2$ , an edge boss to bear against the side 50 of the shackle-end in the locking opening;  $b^3$ , a guide strip to engage a notch in a side of the plunger plate before mentioned;  $b^4$ , a bearing strip to lie close to the upper side of the heel-bar of the locking tumbler before mentioned to hold said heel-bar to its bearings; 55  $b^5$ , a bearing strip against which the bolt spring may ride;  $b^6$ , a rectangular retaining boss to help in keeping the top of the rotating key-guide disk in place;  $b^7$ , a wall having a semicircular notch 13 to form a ward in the plane of the wall  $a^7$  before mentioned, while  $b''$  and  $b''$  are two posts to meet the upper or forward ends of the guide flanges  $a^6$  and  $a^6$  60 also before mentioned; 14 is a rectangular recess to receive and hold in place a V-spring when such a spring is to be applied to the locking tumbler; 15, a circular recess to re-

ceive and hold in place the end of the coiled spring to be applied to said tumbler; 16, a semicircular opening in the wall  $b$  to complete the circular passage way of the key 70 through the bottom of the case; and 17, a concaved recess in which to rotate or hold in place the top of the circular key-guide disk before mentioned. The covering portion B 75 and all its contained elements may be integrally made, as in one casting.

The shackle C, being of the ordinary U-shaped pattern, but may have any form in cross-section, has one end  $c$  pivoted to the 80 case by means of the pin  $a^3$  in the opening 2, while a forwardly projecting lip or shoulder  $c'$  is adapted to rest on top of the case to close the opening 2 at this point; and the other end  $c^2$  is adapted to enter the locking opening 1, 85 and is provided, across its inner face, with a groove or notch  $c^3$  adapted to receive a lip or forward end projection of the slide-bolt, to lock this end of the shackle within the case, while a shoulder  $c^4$ , surrounding the end  $c^2$ , 90 rests on top of the case, and serves to close the opening 1 at this point. When closed the outer faces of the shackle ends are flush with the end walls of the case.

In the forward end of the case, in the chamber 3, is a plunger-plate D, having recesses 95  $d$ , in two edges, to be engaged by the guide strips  $a''$  and  $b^3$  (Fig. 8); this plate is secured to the top of a shaft  $d'$  extending downward, through the cut-out 7, a prescribed distance, 100 where its lower end is secured to the top of a plate D', forming a shoulder, having projecting from its under side a pin  $d^2$  to enter and hold in place the upper end of a coiled or spiral spring D<sup>2</sup>, pressing upward against said 105 plate, while its lower end rests on the bottom of the case; the spring is shown compressed in Fig. 2, when the lock is closed, and expanded in Fig. 3, when the lock is opened, the plunger-plate and parts appearing in position above. 110

Resting against the inside of the bottom of the lock case and rotatable in the semicircular recesses 10 and 17, is a circular disk E having, centrally through its body, a rectangular 115 slot  $e$  for the passage of the key; said disk serving as a revoluble key-guide and to close the circular opening in the bottom of the lock case, formed by the semicircular cuts 9 and 16.

In the drawings F designates the specially 120 prepared key having a finger-grip  $f$  for turning, and a blade F' to be passed through the slot  $e$  and into the lock to open the same. In the edges of the blade, at prescribed intervals, are arranged in opposite pairs, notches  $f'$  and 125  $f'$ , each pair adapted to pass over a ward of the lock to allow the key to be turned. The portions  $f^2$  and  $f^2$  of the blade are adapted to engage the body of the bolt to withdraw its forward end or lip from the shackle-notch  $c^3$ ; 130 the recesses  $f^3$  and  $f^3$  are adapted to pass over a wall or blade integral with the bolt, without disturbing the same; the points  $f^4$  and  $f^4$  are adapted to engage and lift the for-

ward end of the pivoted tumbler from a notch or depression in the bolt to allow it to be withdrawn or moved back; and the rounded point  $f^5$  at the upper end of the key is adapted to enter the recess 8, and to rotate therein, to keep this end of the key in place. The key, here described, with all its contained elements, may be punched, at one operation, out of a strip of sheet metal.

In the drawings G designates the specially constructed slide-bolt, shown in place in the lock, in side elevation in Figs. 2 and 3; in top view in Figs. 7 and 8; in vertical cross section in Figs. 9 and 10; and detached, in Figs. 11, 12, 13 and 14. The main body of the bolt is practically a rectangular block, whose top  $G'$  is practically level and adapted to lie next to the plate  $B'$  against which it may ride; on the under side is a recess or cut-out leaving legs,  $G^2$  and  $G^3$ , far enough apart in any position of the bolt to avoid contact with the entering key, and whose lower ends or feet  $g$  are adapted to lie next to the plate  $A^2$  on which they may ride; the lower side  $g'$  of the bolt lies next to the partition walls  $a^5$  and  $a^5$  against which it may ride; the forward leg  $G^2$  extends upward to meet the top wall  $a$  of the case against which it may ride, leaving a space behind, between the top wall  $a$  of the case and the top  $G'$  of the bolt adapted to be occupied by the pivoted tumbler yet to be described; projecting forward from the upper portion of this leg extension, and a little less than the width of the bolt, is a lip  $g^2$  adapted to be engaged by the horizontal notch  $c^3$  to lock the shackle, while behind the lip is a depression  $g^3$  in the leg-extension, adapted to be engaged by the forward end of the tumbler before mentioned to lock the bolt to the shackle; beneath the top  $G'$  is a second cut-out in which the key may turn, leaving a shoulder  $g^4$  rearward against which the portions  $f^2$  of the key impinge to move the bolt rearward to unlock the shackle, and a side wall  $g^5$  to separate the shoulder  $g^4$  from the tumbler side of the bolt, and over which the recesses  $f^3$  of the key may freely move; and  $G^4$  is a narrow projection rearward from the leg  $G^3$  and in prolongation of the lower side of the bolt (Fig. 11), against the rear end of which an arm of a coiled wire spring  $G^5$  secured to the lock case as at 18 acts to keep the bolt pressed forward, and above (Fig. 12) is a rearwardly projecting lip  $g^6$  to confine said arm of the spring in this direction to the bolt, while in front of the lip and above the leg  $G^3$  is a depression  $g^7$  to allow the bolt to be moved freely back and forth under the pivoted heel-bar of the tumbler.

A tumbler H, punched in one piece out of sheet metal and shown in Figs. 15 and 16, has the extremities of its heel-bar  $h$  pivoted in the U-shaped recesses 6 and 6, the body of its blade  $h'$  lying between the bolt and the top wall  $a$  of the case to keep the body of the bolt laterally in place, and its forward end  $h^2$  adapted to engage the depression  $g^3$  to se-

curely hold the bolt, as well as to be lifted therefrom to release the same.

In Fig. 17 is shown a coiled spring I which has one end in the circular recess 15 of the plate  $B'$  to be kept in place, and the other end on the back of the blade  $h'$  of the tumbler to keep its forward end  $h^2$  pressed into the depression  $g^3$  of the bolt, keeping it securely locked, as is shown in Fig. 7; and to be compressed, when said tumbler blade has said end lifted from said depression, as is shown in Fig. 8. The spring I may be dispensed with and a V-spring I' (Figs. 18 and 19) may be used instead, having one of its arms placed in the rectangular recess 14, and its other arm against the back of the tumbler blade, and all this without involving any new invention. This latter application being so apparent, its separate illustration was deemed superfluous.

Having now described the invention, what I do consider new, and desire to secure by Letters Patent, is—

1. In a padlock such as hereinbefore described and having a bolt chamber, such as described, extended underneath the top, in the upper portion of the case, a shackle having one end pivoted to the top of the case at one end of the chamber, and the other end adapted to pass through said top into the other end of said chamber, and a horizontal notch in and across the inner face of the free end of said shackle, the specially constructed slide-bolt G, comprising the practically rectangular block having the top  $G'$ , the legs  $G^2$  and  $G^3$  having the key recess therebetween and the feet  $g$ , the lower side  $g'$ , the upward extension of the leg  $G^2$  having the forwardly projecting locking lip  $g^2$  and behind the lip the depression  $g^3$ , the unlocking shoulder  $g^4$  underneath the top  $G'$ , the separating wall  $g^5$  along the tumbler side of the bolt, the narrow rearward projection  $G^4$  having the farther rearwardly projecting lip  $g^6$  and the forwardly extending top depression  $g^7$ , the bolt placed into the bolt chamber as described and adapted to be moved back and forth within said chamber, and means provided to press said bolt forward such as a spring  $G^5$  secured to the case as at 18, all substantially as described and for the purpose set forth.

2. The combination in a padlock having a shackle pivoted at one end to the top at an angle of the case and the other or free end having across its inner face the horizontal notch  $c^3$  to pass through the top near the other angle of the case, the bolt-chamber 3 in the upper portion of said case, with the specially constructed slide-bolt G placed within said chamber, movable back and forth therein, and comprising the rectangular block having the top  $G'$ , the legs  $G^2$  and  $G^3$  having the key recess and the feet  $g$ , the lower side  $g'$ , the upward extension of the leg  $G^2$  having the forwardly projecting locking lip  $g^2$  and behind the lip the depression  $g^3$ , the unlocking shoulder  $g^4$  underneath the top  $G'$ , the

separating wall  $g^5$  along the tumbler side of the bolt, the narrow rearward projection  $G^4$  having the rearwardly projecting retaining lip  $g^6$  and the forwardly extending top depression  $g^7$ , and means provided such as the spring  $G^5$  secured to the case as at 18 to actuate said bolt, of the tumbler H having the extremities of its heel-bar  $h$  pivoted in the U-shaped recesses 6 and 6, the body of its blade  $h'$  between the body of the bolt and the top wall  $a$  of the case, and the forward end  $h^2$  of the blade in the depression  $g^3$  of the bolt, means provided such as a spring having one end applied to a side plate as B'

of the case and the other end to the back of the tumbler blade, and means provided such as the key F as described, having the points  $f^4$  and  $f^4$  and the portions  $f^2$  and  $f^2$  whereby said tumbler end may be raised and the bolt withdrawn to open the lock, substantially as described and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JACOB B. AMWAKE.

Witnesses:

DANL. H. HERR,  
EDWIN BOOKMYER.