Jan. 11, 1938. B. S. FALK 2,104,981

LOCK

Filed Nov. 6, 1936

Fig. 1.

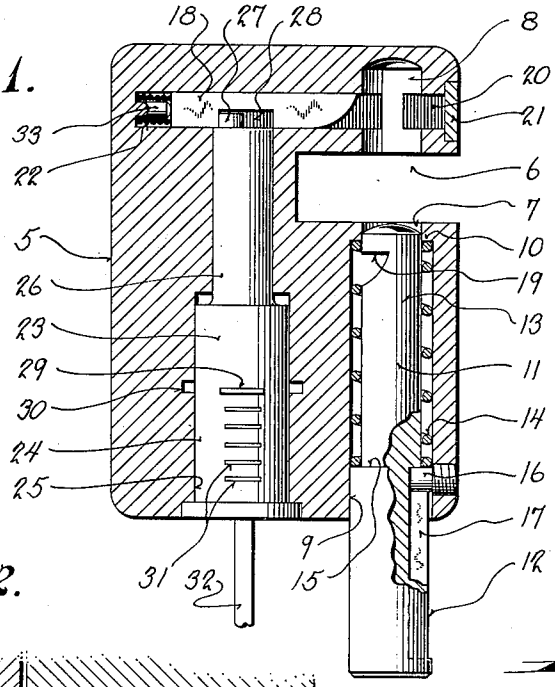


Fig. 2.

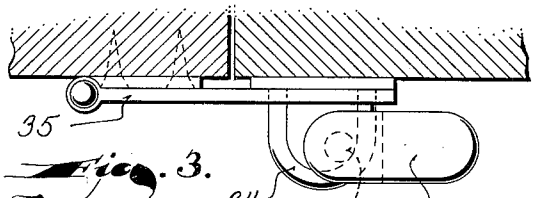


Fig. 3.

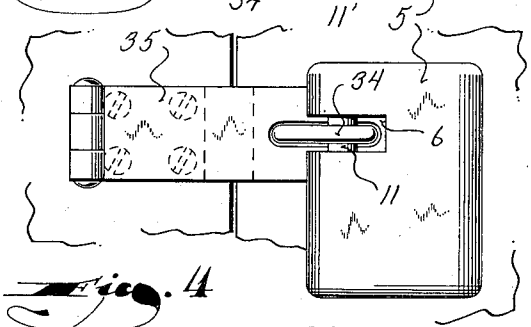


Fig. 4.

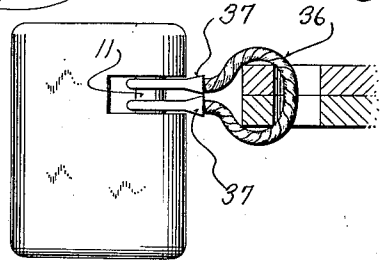


Fig. 5.

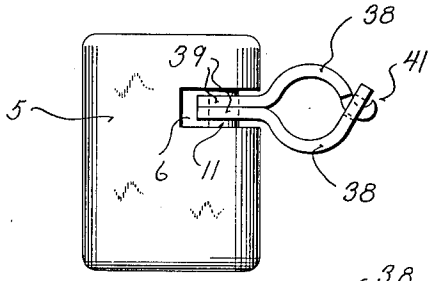
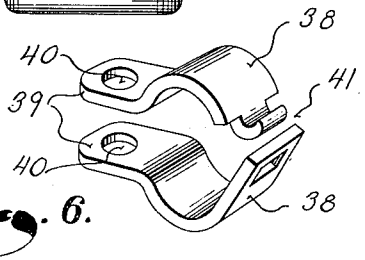


Fig. 6.



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UNITED STATES PATENT OFFICE

2,104,981

LOCK

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Application November 6, 1936, Serial No. 109,414

5 Claims. (Cl. 70—33)

This invention relates to locks, particularly padlocks, and has as one of its objects to provide greater security by so constructing the lock that the shackle when in its locked position is substantially completely concealed and thereby protected against the attacks of tools which might be used for its destruction.

More specifically it is an object of this invention to provide a padlock wherein the shackle, when in its locked position, is completely covered and enclosed by the body or case, except for the small portion thereof which passes through the part or parts to be locked so that the part or parts to be locked cooperate with the body or case to prevent access to the shackle.

Another object of this invention is to provide a padlock which may be snapped shut and locked by merely pushing in the projecting end of the shackle until it rests flush with the adjacent wall of the body or case.

Another object of the invention is to provide a padlock so constructed that the component parts are assembled with the body or case without the necessity for exposed screws, rivets or pins susceptible to removal, and which is so constructed that only through the actuation of the key controlled lock is it possible to release the shackle.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates several complete examples of the physical embodiment of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a section view of the padlock with the shackle in its open or unlocked position;

Figure 2 illustrates one manner of using the lock;

Figure 3 is a front view of the structure shown in Figure 2;

Figure 4 is a view illustrating the use of an adapter to adapt the padlock to parts of larger dimensions than the capacity of the padlock;

Figure 5 is a view similar to Figure 4 illustrating another form of adapter; and

Figure 6 is a perspective view of the adapter shown in Figure 5.

Referring now particularly to the accompanying drawing in which like numerals designate like parts throughout the several views, the numeral 5 represents the body or case of the padlock, which is preferably formed from one solid block of metal.

Extending into the body or case from one edge is an open slot or recess 6, the opposite side walls of which are spaced apart a distance sufficient to receive the part or parts to be locked. Intersecting this slot is a bore 7, the inner end portion 8 of which is on one side of the slot 6, and its open ended outer portion 9 on the opposite side. The latter open ended portion 9 of the bore is counterbored to define a shoulder 10 adjacent to the slot.

Slidable in the bore 7 is a shackle 11 having an outer portion 12 of enlarged diameter to fit the counterbore, and an inner end portion 13 adapted to extend across the slot 6, passing through and locking the part or parts disposed in the slot.

An expansile spring 14 confined between the shoulder 10 at the bottom of the counterbore and the shoulder 15 at the juncture of the two diameters of the shackle, yieldingly urges the shackle outwardly of its bore. The spring propelled motion of the shackle is limited by a stop 16, secured in the body or case and engaging in a longitudinal groove 17 in the side of the shackle. The stop 16 may be screwed in place to facilitate assembly or, if desired, may consist merely of a pin having a driving fit with a hole opening to the counterbore.

The length of the shackle is such that when it is pushed in against the action of its spring to its locked position, extending across the slot, its outer end is substantially flush with the adjacent surface of the body or case.

Upon being pushed into its locked position, a spring urged latch 18 automatically engages in a keeper recess 19 formed in the inner end of the shackle to secure the shackle against retraction to its open position. This latch 18 is slidably disposed in a passageway 20, formed transversely in the body or case and intersecting the inner end portion 8 of the shackle bore. One end of this passage is permanently closed by the solid metal of the body or case and its other end is plugged as at 21 after proper assembly of the parts.

An expansion spring 22 yieldingly projects the latch to its operative position from which it is retractable only through the operation of a key controlled lock 23. The lock 23 is of the con-

ventional type comprising a cylinder **24** rotatably mounted in a bore **25** in the body or case with an integral projection **26** on its inner end extending to the passage **20**. At the extremity of the extension **26**, an eccentrically located driving cam **27** projects to a recess **28** in the latch so that upon rotation of the lock cylinder the latch may be retracted against the action of its spring to free the shackle.

Any suitable means may be provided for securing the plug or cylinder in place and in the present instance a retaining member **29** carried by the cylinder engages in an annular groove **30** in open communication with the bore **25**.

The usual tumblers **31** are mounted in the cylinder to engage in a tumbler groove and secure the cylinder against rotation except when the tumblers are retracted by the insertion of a proper key **32**.

The rotation of the cylinder can be limited in any suitable manner, and in this instance by having the inner end of the latch **18** strike the tip of a spring centering pin **33**.

As hereinbefore stated the part or parts to be locked are disposed in the open slot or recess **6** with the shackle passing therethrough. A conventional application or use of the padlock is illustrated in Figures 2 and 3 where the hasp **34** of a hinge type door fastening **35** is received in the slot with the shackle passing therethrough.

It will be noted that when in use the shackle of the padlock is substantially completely concealed and protected against the attacks of destructive tools. Aside from the relatively small and invulnerable part of the shackle which is used in pressing the same to its closed or locked position, only that portion of the shackle that extends across the open slot or recess is unprotected by the body or case of the padlock and this portion is substantially entirely covered by the part or parts disposed in the open slot or recess.

Consequently, it is impossible to saw, file, chisel or in any other way apply destructive force to the shackle for the purpose of defeating the lock.

While the use of the padlock per se is restricted as to the thickness of the part or parts to which it may be applied, adapters such as illustrated in Figues 4, 5, and 6 may be employed to permit the lock to be used in instances where the actual members to be locked are of such dimensions as to preclude their being received in the slot of the padlock body.

The adapter illustrated in Figure 4 consists of a length of steel cable **36** to the ends of which eyes **37** are secured. The openings in the eyes **37** are of a size to permit the passage of the shackle therethrough, and in use the steel cable is threaded through the parts to be locked together as is clearly shown in Figure 4.

The adapter illustrated in Figures 5 and 6 comprises two substantially similar strap members **38** having flanges **39** apertured as at **40** to receive the shackle **11**. The opposite ends of the strap members are provided with an interengaging connection **41**, which forms substantially a hinge and remains secure as long as the flanged ends of the straps are held relatively close together, as by being confined in the slot **6**.

From the foregoing description taken in connection with the accompanying drawing it will be readily apparent to those skilled in the art that this invention provides a substantial improvement in the construction of padlocks and that it adds materially to the security of the lock by substantially completely concealing or covering the shackle.

It will also be apparent that the construction of this padlock facilitates assembly, and by virtue of the fact that the lock is closed by merely depressing the shackle, it likewise facilitates application.

What I claim as my invention is:

1. In a padlock, a body having spaced portions between which a part or parts to be locked are receivable, a shackle movable in the body to and from a locked position extending across the space between said spaced portions so as to pass through the part or parts to be locked whereby the active portion of the shackle is substantially entirely covered by the part or parts to be locked to prevent access to said active portion of the shackle, a spring to yieldingly urge the shackle to an unlocked position, a spring urged latch slidable endwise into interlocking engagement with the shackle to hold the same in its locked position, and key controlled means for retracting the spring urged latch to free the shackle for spring actuated movement to its unlocked position.

2. A padlock comprising a solid block-like body having an open slot extending in from one side edge thereof and having a bore open at one end intersecting said slot, a second bore parallel to the first bore inwardly of the bottom of the slot and a transverse passage intersecting both of said bores, a shackle slidable in the first bore to and from a locked position extending across the open slot, spring means yieldingly urging the shackle out through the open end of the bore so that the shackle is movable to its operative locked position by the application of an inward force on its projecting end, a spring urged latch movable in the transverse passage and engageable with the shackle to secure the same in its locked position, and key controlled locking means in the other bore having operative connection with the spring urged latch for retracting the same to free the shackle.

3. A padlock comprising a solid block-like body having a slot extending in from one side edge thereof and having a two diameter bore open at its large diameter end and having its small diameter end portion intersected by the slot, the body also having a transverse passage intersecting the small diameter end portion of the bore, a two diameter shackle slidable in the bore, a coil spring encircling the small diameter end portion of the shackle and confined between the shoulders formed at the junctions of the two diameters of the bore and the shackle to yieldingly urge the shackle out through the open end of the bore, means to limit the spring propelled movement of the shackle, said shackle being depressible to project its small diameter end portion across the slot and opposite the transverse passage, a spring urged latch slidable in said transverse passage and engageable with the small diameter end portion of the shackle to secure the same in locked position, and key controlled means for retracting the spring urged latch.

4. A padlock comprising a solid block-like body having a slot extending in from one side edge thereof and having a two diameter bore open at its large diameter end and having its small diameter end portion intersected by the slot, the body also having a transverse passage intersecting the small diameter end portion of the bore, a two diameter shackle slidable in the bore, a coil spring encircling the small diameter end portion of the shackle and confined between the shoul-

ders formed at the junctions of the two diameters of the bore and the shackle to yieldingly urge the shackle out through the open end of the bore, common means for limiting the spring propelled movement of the shackle and for holding the shackle against turning, the small diameter end portion of the shackle having a notch, and the shackle being depressible to project its notched end portion opposite the transverse passage, a latch slidable in said passage, a spring yieldingly urging the latch toward the bore to snap into the notch in the shackle, and key controlled means for retracting the latch to free the shackle for spring propelled movement to unlocked position.

5. A padlock comprising a solid block-like body having a slot extending in from one side edge thereof and having a two diameter bore open at its large diameter end and having its small diameter end portion intersected by the slot, the body also having a transverse passage intersecting the small diameter end portion of the bore, and another bore parallel to the first and opening to the transverse passage, a two diameter shackle encircling the small diameter end portion of the shackle and confined between the shoulders formed at the junctions of the two diameters of the bore and the shackle to yieldingly urge the shackle out through the open end of the bore, means for limiting the spring propelled movement of the shackle, said shackle having a notch in its small diameter end portion and being depressible to dispose its notched portion opposite the transverse passage, a spring urged latch slidable in said passage to engage in the notch of the shackle and to hold the same in its locked position, and a key controlled lock cylinder disposed in the second named bore and having an eccentric driving connection with the spring urged latch for retracting the same to free the shackle.

BERNARD S. FALK.