

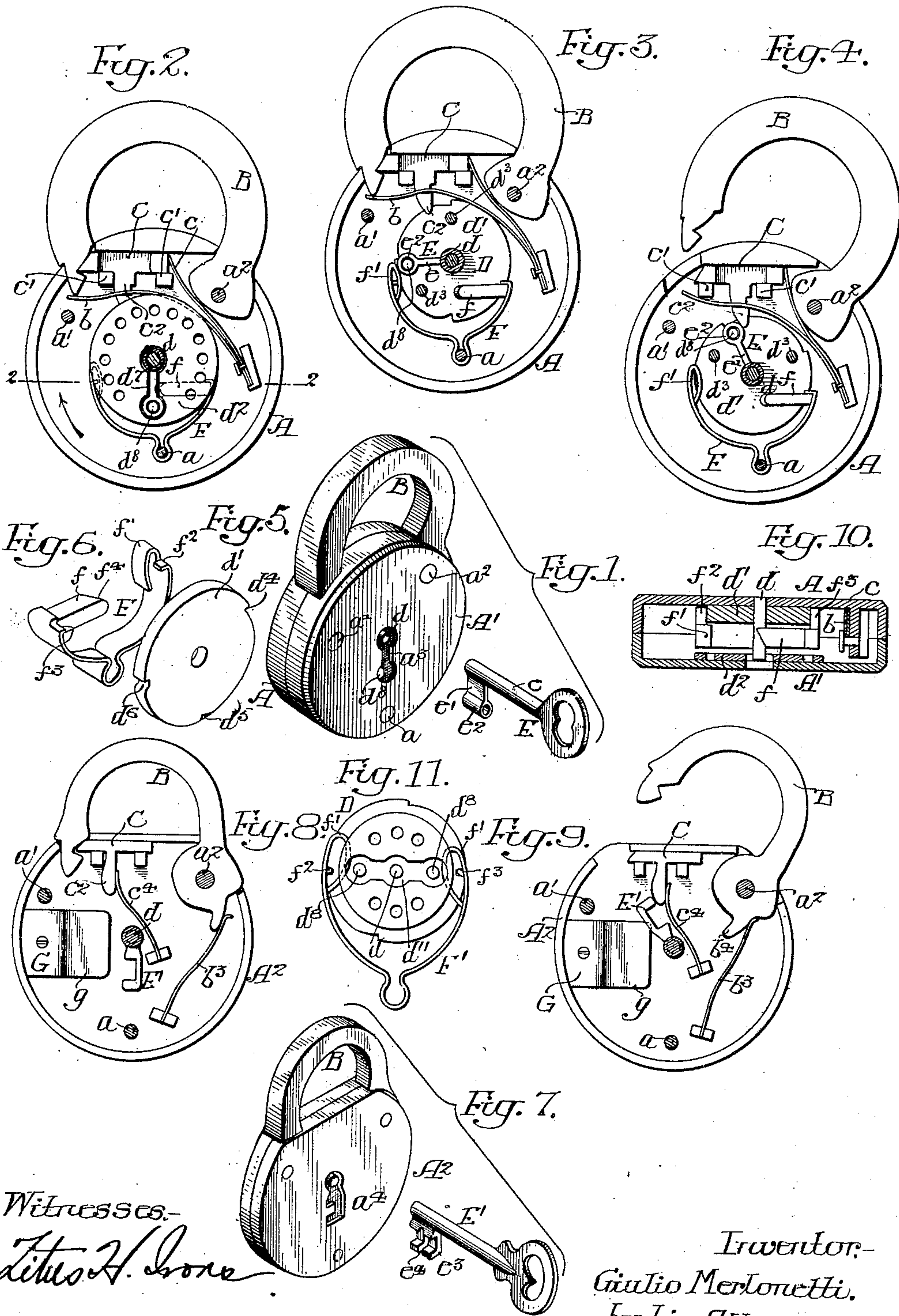
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LOCK.

APPLICATION FILED APR. 2, 1909.

925,122.

Patented June 15, 1909.



Witnesses.

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GIULIO MERLONETTI, OF WEST CHESTER, PENNSYLVANIA.

LOCK.

No. 925,122.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed April 2, 1909. Serial No. 487,564.

To all whom it may concern:

Be it known that I, GIULIO MERLONETTI, a subject of the King of Italy, residing in West Chester, Pennsylvania, have invented certain Improvements in Locks, of which the following is a specification.

One object of my invention is to provide a relatively simple form of padlock so designed that it cannot be unlocked by any device other than a key of predetermined design.

It is further desired that the parts of the lock shall be so arranged that the key, in being moved to release the hasp, necessarily carries with it a movable member so designed as to prevent the access to the bolt of any structure other than the key; this member being so constructed as to be automatically held from moving in case it should be attempted to operate it without the proper key.

I further desire to provide a padlock with a bolt of novel form so arranged as to permit of the use of a relatively simple construction of key for its operation.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which:—

Figure 1, is a perspective view of a padlock and its key, constructed according to my invention; Figs. 2, 3 and 4 are front elevations of my padlock with the cover removed, and illustrating the construction and operation of the various parts; Figs. 5 and 6 are perspective views of certain of the detail parts of the invention; Fig. 7, is a perspective view of a modified form of padlock; Figs. 8 and 9 are front elevations illustrating the detail construction and operation of the lock shown in Fig. 7, Fig. 10, is a transverse vertical section on the line 2—2, Fig. 2, and Fig. 11, is a fragmentary plan illustrating the construction of another form of the invention.

Referring to Figs. 1 to 6 and 10 of the above drawings, A represents one part of the lock casing and A' the other part thereof; the two being so constructed that when held together by rivets a , a' and a^2 they form a flat, substantially cylindrical container. The rivet a^2 serves as a pivot for one end of a hasp B whose other end projects into the casing of the lock formed by the parts A and A' and

is hooked or recessed so as to receive the end of a slidable bolt C.

The hooked end of the hasp is at all times acted on by one end of a flat spring b so that it tends to move out of the casing, while the bolt C is acted upon by a spring c so that it is normally maintained in position to engage and hold the hooked end of the hasp B. Said bolt is guided between the outer wall of the part A of the casing and a pair of projecting lugs c' spaced apart and has a projecting arm c^2 extending between said lugs which thereby serve to limit the amount of longitudinal movement of said bolt.

A guiding pin d is permanently fastened to the center of the part A of the casing and projects into the key hole opening a^3 of the part A' so as to be flush with the outside surface of said part. In the present instance this opening is the shape of a dumb bell and is designed for the reception of a key e having a tubular shank whose bit e' terminates in a tubular or hollow cylindrical end e^2 of such shape as to fit into the key hole.

A carriage D is mounted within the casing of the lock so as to turn upon the guiding pin d as a spindle, and consists of a circular back plate d' rigidly connected to a similarly shaped front plate d^2 by means of a number of pins d^3 .

The edge of the back plate d' is provided with a number of teeth formed by recesses d^4 , d^5 and d^6 preferably placed 90° apart and the various structures are so proportioned that the arm c^2 of the bolt C projects between the front and back plates d' and d^2 . The front plate d^2 has in it a dumb bell shaped opening d^7 which, when the parts are in their normal positions, is immediately back of and registers with the opening a^3 in the part A' of the casing.

In addition to the pins or posts d^3 , I provide a pin d^8 , mounted on the back plate d' and projecting into the outer enlarged part of the dumb bell shaped opening d^7 in the front plate, and it will be noted that the guiding pin d projects through the other enlarged portion of said opening.

Mounted upon the rivet a is a curved plate F of spring material, embracing the carriage D; it being preferably formed of a piece of flat spring steel, one arm of which extends in one direction from the rivet a and carries an

inwardly projecting finger f lying between the front and back plates d' and d^2 of the carriage D. This arm has also an abrupt inwardly projecting end forming a tooth f^3 , and it will be noted from Fig. 6, that the inner end of the finger f is inclined or beveled, as indicated at f^4 in such manner that it is engaged by the portion e' of the key bit when this latter is entered in the lock prior to the operation thereof. The second arm of this locking piece F has its ends split in such manner that one branch may be bent on itself as indicated at f' to form a rounded abutment, while the other is turned abruptly inward to form a second tooth which is practically at right angles to the body of said arm, as indicated at f^2 , and capable of entering certain of the recesses in the back plate d' to limit or prevent revolution of the carriage.

Normally the tooth f^3 enters the notch d^6 of the back plate of the carriage B so as to effectually prevent its movement in one direction, while the second tooth f^2 on the other branch of the locking piece F similarly enters the recess d^4 so as to prevent movement of the carriage in the other direction. Under operating conditions, however, the forcing of the key into the lock casing through the two openings a^3 and d^7 causes longitudinal movement of the finger f by its engagement with the beveled end thereof, and a consequent outward movement of its end of the locking piece F, with the result that the tooth f^3 is moved out of the recess d^6 . It is then possible to turn the key E, and with it the carriage D, in the direction indicated by the arrow Fig. 2, with the object of releasing the hooked end of the hasp. When the key has been revolved almost 90° , its cylindrical portion e^2 strikes the rounded or gradually curved end f' of the locking piece F, and acting upon it as a cam, forces it outwardly so that it is possible to continue the revolution of the carriage D without the tooth f^2 falling into the recess d^5 . It is obvious that even if the said carriage be released from its normal position by a false key, it can be turned only to an angle of about 90° , for in the absence of a key having the properly proportioned cylindrical part e^2 , the tooth f^2 necessarily enters the recess d^5 and prevents further forward turning of the carriage. Finally, when the key and the carriage have been turned through an angle of almost 90° the cylindrical end e^2 of the key bit strikes the stem c^2 of the bolt C and forces the latter to move longitudinally against the spring c so as to cause it to release the hooked end of the hasp B. This latter is then free to move to its open position under the action of the spring b . Upon returning the key and with it the carriage D to their normal positions, it is possible to remove the key from the casing, and at any time the hooked end of the hasp may be again entered into its opening

in the casing where it will be held in the locked position by the spring actuated bolt C whose end is properly beveled to permit of the entrance of the hooked end of said hasp.

The particular form of bolt employed by me may be used in a lock constructed as shown in Figs. 7 to 9 inclusive, where as before, the padlock casing is provided with a centrally placed guiding pin d for the reception of the tubular end of a key E'. Said key has a transversely slotted bit e^3 which is also longitudinally notched; there being a correspondingly formed hole a^4 in the casing A². Within said casing is mounted a plate G having an elevated portion or ward g projecting toward the guide spindle d at such a distance from the back of the casing that when the key is properly entered and turned, said ward enters the slot e^4 therein and permits such revolution. In this instance, also, the bolt C is provided with a projecting stem c^2 which, as shown in Fig. 9, is designed to be engaged by the end of the key bit when the key has been turned a sufficient distance.

Movement of the bolt under the action of the key is resisted by a spring c^4 which tends to hold it in the position indicated in Fig. 8, in which it engages the hasp B to maintain it in its closed or locked position. In this instance the hasp is acted on by a spring b^3 which engages a projecting arm b^4 as long as said hasp is closed so as to tend to move it into its open position. The end of the hasp is so formed that when it reaches its full open position, as shown in Fig. 9, the spring b^3 tends to hold it from further movement.

In the form of the invention shown in Fig. 11, the carriage D' may be made with two guide pins d^8 on opposite sides of the central pin d and with a double dumb bell shaped hole d^{11} in the top plate of the carriage for the reception of a correspondingly shaped double bitted key (not shown). In this case the back plate of the carriage has four notches 90° apart and both arms of the locking piece F' are provided with curved and slightly inclined end portions f' in addition to the teeth f^2 and f^3 . These inclined parts are both designed to be moved outwardly by the key when this is inserted and said teeth thereby caused to disengage the back plate of the carriage.

I claim:—

1. The combination in a lock, of a casing, a carriage therein capable of being turned by a key, and formed by two parallel plates rigidly connected to each other, a bolt having a portion extending between said plates, and locking means for the carriage capable of being released by the key.

2. The combination in a lock, of a casing, a carriage capable of being turned by the key, and consisting of two rigidly connected plates spaced apart, a bolt having an arm extending between said plates of the carriage,

so as to be engaged by a key after the carriage has been turned a predetermined distance, and means for automatically locking the carriage against movement in the absence of the key.

3. The combination in a lock, of a casing, a bolt, a revoluble carriage capable of being turned by the key so as to permit said key to operate the bolt, an automatic pawl placed to engage and lock said carriage in the absence of the key, after it has been moved a definite distance from its normal position.

4. The combination in a lock, of a casing, a bolt, a revoluble carriage placed to receive a key and capable of being turned thereby into a position to permit said key to operate the bolt, means released by the key for holding said carriage in its normal position, and means for locking said carriage in the absence of the key after it has been moved from its normal position.

5. The combination in a lock, of a casing, a bolt therein, a carriage revolubly mounted in the casing and including a plate having a peripheral recess or recesses, a pawl or pawls mounted in the casing and capable of entering said recess or recesses to lock the carriage, said pawl or pawls being placed to be released by the key.

6. The combination in a lock, of a casing having a carriage consisting of two rigidly connected plates, means for revolubly supporting said plates, a bolt having an arm extending between the plates, with a spring pawl capable of holding the plates from movement and placed to be acted on by a key when the carriage is turned thereby so as to be rendered inoperative.

7. The combination in a lock of a casing, a hasp pivoted at one end to the casing and projecting into the same at the other end, a T-shaped bolt capable of engaging the second end of the hasp to lock the same, a spring acting on the stem of the bolt and tending to force it into its locking position, and a revoluble carriage for the reception of the key placed to permit the bit of the key to engage the stem of the bolt when said key is turned.

8. The combination in a lock of a casing having a hasp, a bolt in the casing capable of engaging the hasp to lock it, a carriage revolubly mounted in the casing and provided with recesses, a pair of spring pawls mounted in the casing and capable of entering the recesses, and a key capable of engaging said pawls to cause them to release the carriage and also capable of actuating the bolt.

9. The combination in a lock, of a casing, a revoluble carriage therein, having a recess, a spring pawl having an inclined finger and also having a tooth capable of entering said recess to hold the carriage, and a bolt capable of being actuated from a key after the carriage has been turned to a predetermined distance, said inclined finger being placed to be moved by the key when it is placed in the lock, so as to cause the pawl to move out of the recess of the carriage.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GIULIO MERLONETTI.

Witnesses:

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WM. A. BARR.