Sept. 24, 1935. L. E. WILLIAMS 2,015,248

LOCK

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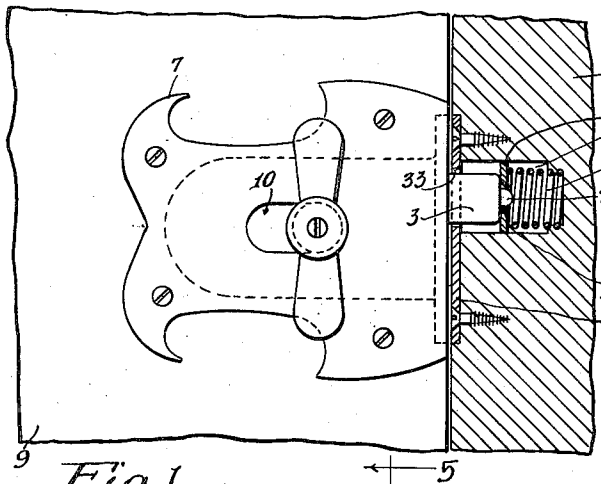


Fig. 1

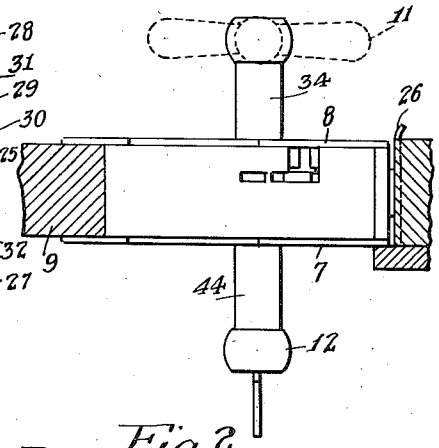


Fig. 2

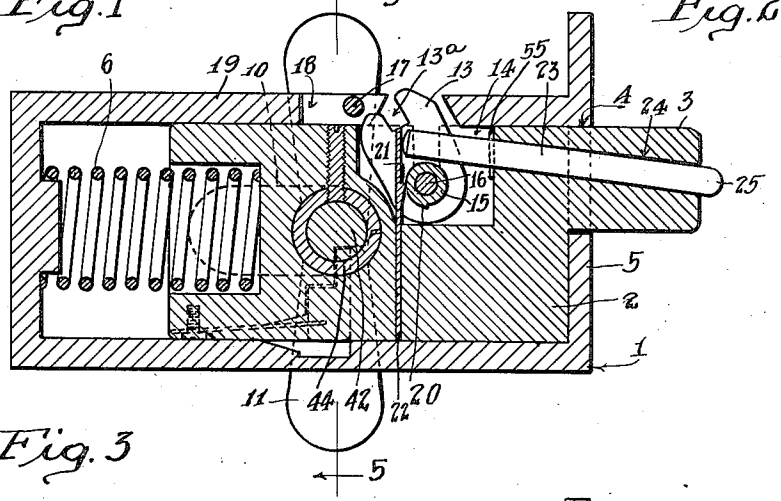


Fig. 3

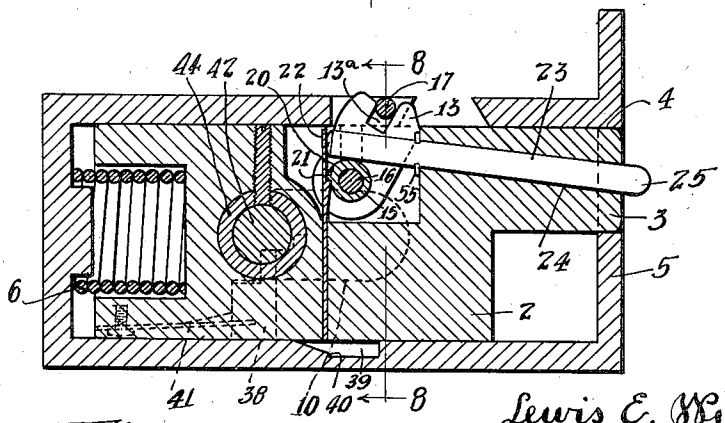


Fig. 4

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Fig. 5

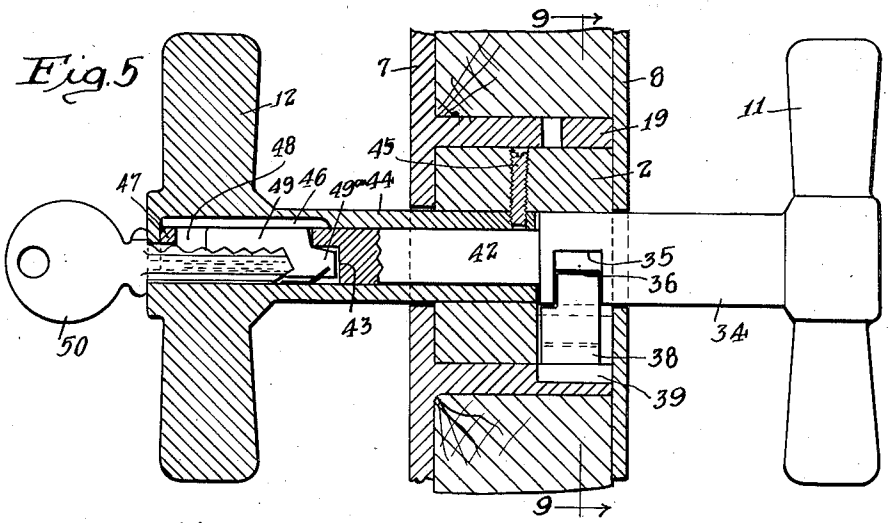


Fig. 6

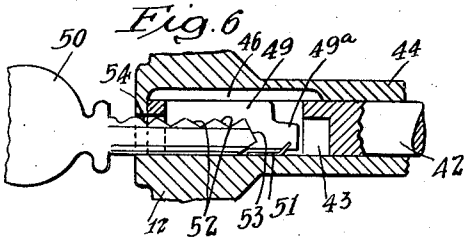


Fig. 7

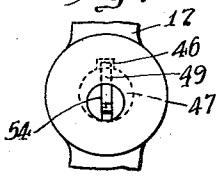


Fig. 8

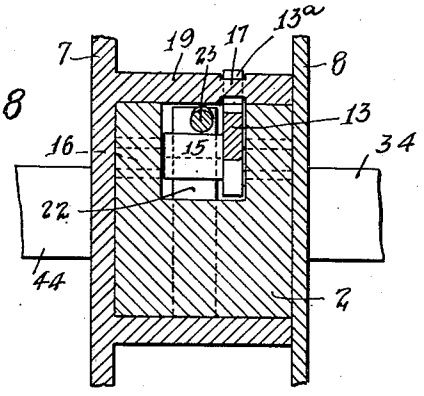
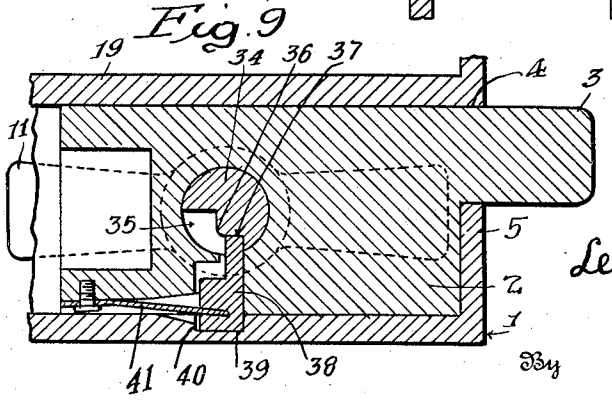


Fig. 9



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UNITED STATES PATENT OFFICE

2,015,248

LOCK

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Application February 3, 1933, Serial No. 654,973

13 Claims. (Cl. 70—91)

This invention relates to locks, and while features of the invention may be employed in locks used for different purposes, the invention is especially useful when applied to a door lock.

The general object of the invention is to simplify the construction of locks and to provide a lock having a single bolt which can operate as a latch and also as a lock bolt.

Unless a lock bolt is of hardened metal, it is sometimes possible for a burglar to apply a hacksaw, or similar instrument, to cut off the projecting end of the bolt to gain entrance. One of the objects of this invention is to provide the bolt with means which would make it practically impossible for the bolt to be sawed off as with a hacksaw.

In the preferred embodiment of the lock the bolt is provided on the inner side of the door with a handle which enables the bolt to be moved at will to unlock the door, and one of the objects of the invention is to provide simple key-controlled means on the outer side of the door for unlocking it.

One of the features of the invention consists in automatic means for latching the bolt in its withdrawn position when the bolt is moved by its handle to unlock the door, and one of the objects of the invention is to provide simple means for releasing this automatic latching means to enable the bolt to move to its locked position when the door is swung to its closed position.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce an efficient lock.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawings:

Figure 1 is a side elevation of a portion of a door provided with my lock and illustrating a portion of the door jamb in vertical section.

Figure 2 is a plan of the complete lock and showing the adjacent portions of the door and door jamb in cross-section.

Figure 3 is a longitudinal vertical section through the lock upon an enlarged scale and showing the parts in the relation which they have when the bolt is in its extended or locking position.

Figure 4 is a view similar to Figure 3, but showing the bolt withdrawn.

Figure 5 is a vertical section taken about on the line 5—5 of Figure 3, certain parts being broken away; this view particularly illustrates the key-controlled means for unlocking the door.

Figure 6 is a view showing the same parts as those illustrated in the left portion of Figure 5, but representing the key in the act of being inserted for unlocking the door.

Figure 7 is a front elevation of the inner side of the lock in the vicinity of the key-hole, certain parts being broken away.

Figure 8 is a vertical section, taken about on the line 8—8 of Figure 4, the outer portions of the lock being broken away.

Figure 9 is a vertical section, taken about on the line 9—9 of Figure 5 and particularly illustrating the means for latching the bolt in its extended or locking position.

Referring more particularly to the parts, and especially to Figures 1, 3 and 4, the lock includes a casing 1 made of metal and of box form so as to operate as a guide for a bolt 2, said bolt having a neck 3 at its forward end that slides in and out through an opening 4 in the forward wall 5 of the casing. Resilient means is provided for urging the bolt 2 towards its extended or locking position. This means preferably consists of a coiled spring 6 located in the back of the casing.

The inside and outside walls of the casing are in the form of escutcheons 7 and 8, the former of which is located on the outer side of the door 9 to which the lock is attached. These escutcheons are formed with slots 10 to enable the bolt to be moved by hand. For this purpose, the bolt is provided with two handles, that is to say, an inside handle 11 and an outer handle 12.

The lock is provided with means for automatically latching the bolt in its withdrawn position. Any suitable means may be employed for this purpose but, in the present instance, I provide a rocker in the form of a dog 13 which is pivotally mounted in a chamber 14 in the upper side of the bolt. This rocker is provided with a rigid sleeve 15 and is mounted to rock on a transverse pin 16, which pin extends transversely to the bolt so that the rocker 13 swings in the longitudinal plane of the bolt. The upper end of the rocker is formed with a deep notch 13a and when the bolt is moved back the dog is engaged by a fixed transverse pin 17 that is mounted in a slot 18 in the upper wall 19 of the casing. This causes a rotation of the dog 13 in a clockwise direction, and this will bring

a tooth 20 on the side of the sleeve into position above a shoulder 21 formed on the side of a spring 22 that is secured in the bolt and projects up into the chamber 14. In Figure 4 the bolt is indicated latched in its withdrawn position.

A tripping mechanism is provided for effecting the tripping of this detent spring 22 if the door is swung to its closed position. For this purpose, I prefer to provide a tripping pin 23, which is mounted to slide longitudinally and rotate freely in a guide bore 24 in the latch bolt. The forward end of this releasing pin 23 has a rounded projecting nose 25, and when the door is swung to its closed position this nose will engage a curved cam plate 26 that will push the pin inwardly and release the tooth 20 from the shoulder 21. The spring 6 will then immediately advance the bolt to its locking position, shoving it into the keeper 27, which is in the form of a plate carrying the cam 26. If desired, the door jamb 28 may be provided with means for cushioning the advancing bolt to reduce the noise. For this purpose, the door jamb may be provided with a chamber 29 to house a coil spring 30 which presses against a cushion plate 31. This cushion plate normally seats against the inner side of the keeper 27 and has an opening 32 sufficiently large to receive the nose 25 of the release pin. The keeper 27 is provided with an opening 33, through which the bolt projects (see Figure 1).

The lock is provided with means for latching the bolt in its locking position, and this means is key-controlled. For this purpose, the handle 11 is provided with a spindle 34 (see Figures 3 and 5), and this spindle has a notch 35 cut into it, the bottom of which forms a cam 36 (see Figure 9). When the handle 11 is rotated in the proper direction the "high" face 37 of this cam will engage the upper end of a dog 38 (see Figure 9) and force it down into a recess 39 in the bottom wall of the casing so that the lower end of this dog will be back of a shoulder 40. This dog 38, which is in the form of a small block, is normally held in elevated position by a leaf-spring 41. The handle 11 enables this locking block or dog 38 to be actuated from the inner side of the door. In order to enable the dog 38 to be released by key-controlled means on the outer side of the door, the spindle 34 is provided at its outer end with a reduced neck 42, the extreme end of which is provided with a flat slot 43, and the handle 12 on the outer side of the door is provided with a key lock casing in the form of a tubular spindle 44 that encases this neck 42 and is rigidly secured to the bolt 2 by means of a set screw 45 (see Fig. 5). Adjacent the end of the reduced neck 42 and extending outwardly to a point near the outer side of the handle 12 a longitudinal slot 46 is provided in the bore of the handle 12. In the outer end of this bore a small guide 47 is provided having a vertical slot 48 in it for guiding a key-plate 49. This key-plate has a tongue 49a at its forward end that can project into the flat slot 43 to enable a key 50 to rotate the neck 42, but when the key is being withdrawn the key-plate 49 slides outwardly as far as possible in the slot 48 (see Fig. 6). When the key is not in the lock a small leaf-spring 51 holds the key-plate 49 in an elevated position, so that its upper edge will project up into the slot 46 and prevent the guide 47 from being rotated. The key-plate has a series of serrations 52, which are distinctive, and is also provided beyond these serrations with a notch 53 to receive a correspondingly formed key. When the key is inserted through a key slot 54 in the outer face of the handle 12, if its serrations and its nose at its forward end fit into the serrations 52 and the notch 53, it will pull the key-plate down out of the notch 46 and will force the key-plate rearwardly so that the tongue 49a will pass into the flat slot 43. This enables the key to rotate the neck 42 and consequently the spindle 34, of which it forms a part. This will remove the "high" face 37 of the cam from the dog or block 38 and permit the spring 41 to lift the dog above the shoulder 40. The bolt can then be withdrawn by shoving the handle 12 toward the left, as viewed in the figures.

The releasing pin 23 is provided with a small cross-pin 55 (see Fig. 3), which will prevent the pin from becoming dislodged from the bolt 2.

In order to prevent any possibility of a burglar sawing off the projecting extension or neck 3 of the bolt, the releasing pin is made of hardened steel or similar material and is freely rotatable in the bolt. Hence, if a burglar should attempt to saw through the neck 3, when the saw arrived at the releasing pin it would simply rotate the releasing pin on its own longitudinal axis and could not cut through it.

The mode of operation of the lock will now be briefly stated. Assuming that the bolt 2 is in its locking position and the person wishing to operate the lock is on the inner side of the door. He seizes the handle 11 on the inner side of the door and moves it away from the jamb. This movement is permitted by the slots 10 in the escutcheons. This movement compresses the spring 6. As the bolt moves toward the left, as viewed in Figure 3, the fixed pin 17 on the casing enters the notch 13a and rocks the dog 13 through a slight angle in a clockwise direction. This will rotate the sleeve 15 and bring the tooth 20 on the sleeve above shoulder 21. Due to the resiliency of the spring 22 this shoulder 21 will snap under the tooth 20, and this will hold the bolt in its withdrawn position, as indicated in Figure 4. The door can then be left ajar or in any open position. If the door is slammed shut, the nose 25 of the releasing pin 23 will strike the cam plate 26, and this will shove the releasing pin in and disengage the shoulder 21 from the tooth 20. The spring 6 will then immediately advance the bolt to its locking position. As this occurs, the noise is reduced by the cushion plate 31 backed up by the relatively weak spring 30 that will be compressed by the stronger spring 6.

If the person on the inner side of the door wishes to lock it, all he has to do is to rotate the handle 11 in the proper direction to cause the cam 36 (see Fig. 9) to move the locking dog 38 down past the shoulder 40 against the action of spring 41. In this condition, the door can be unlocked on the outside by means of a key 50. When the key is inserted, if its serrations and forward end fit the key-plate 49, it will pull the key plate 49 down out of the slot 46. This will permit rotation of the guide 47, which carries the key-plate 49. Furthermore, as the key is completely inserted, it will shove the key-plate 49 back so that its tongue 49a passes into the flat slot 43, whereupon the key can rotate the spindle 42 in a direction to release the locking dog 38 from the shoulder 40.

When the key is rotated into position to release the locking dog 38, the key-plate 49 will be out of alignment with the slot 46. Hence, in order to withdraw the key, it is necessary to pull it outwardly to disengage the tongue 49a from the flat slot 43 and then to rotate it through 90°

to bring the key-plate into line with the groove 46, whereupon the key can be pulled out from engagement with the key-plate. As this occurs, the key-plate 49 will swing upwardly into the notch 46.

The hardened releasing pin 23 will prevent the neck 3 of the bolt 2 from being sawed off because it is freely rotatable in its bore 24.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and I do not wish to be limited in the practice of the invention, nor in the claims, to the particular embodiment set forth.

What I claim is:

1. In a lock, the combination of a casing, a bolt mounted to slide in the casing, a rotatable handle mounted for lateral movement at one side of the casing, for sliding the bolt, a spring for urging the bolt to its locking position, means actuated by the rotation of the handle for latching the bolt in its locking position, and key-controlled means on the opposite side of the casing from said handle for controlling said last-named means to permit movement of the bolt to its unlocked position.

2. In a lock, the combination of a casing, a bolt mounted to slide in the casing, a rotatable handle mounted for lateral movement at one side of the casing, for sliding the bolt, a spring for urging the bolt to its locking position, means actuated by the rotation of the handle for latching the bolt in its locking position, key-controlled means on the opposite side of the casing from said handle for controlling said last-named means to permit movement of the bolt, and a second handle mounted for lateral movement on the same side of the lock as the key-controlled means for moving the bolt to its unlocked position.

3. In a lock, the combination of a casing, a bolt mounted to slide in the casing, a rotatable handle mounted for lateral movement at one side of the casing, for sliding the bolt, a spring for urging the bolt to its locking position, means actuated by the rotation of the handle for positively holding the bolt in its locking position, a second handle attached to the bolt on the opposite side of the casing from the first-named handle, and key-controlled means mounted in the second-named handle for controlling said last-named means to permit movement of the bolt to its unlocked position.

4. In a lock, the combination of a casing, a bolt mounted to slide in the casing, a rotatable handle mounted for lateral movement at one side of the casing, for sliding the bolt, a spring for urging the bolt to its locking position, means actuated by the rotation of the handle for latching the bolt in its locking position, a second handle rigidly attached to the bolt on the opposite side of the casing from the first-named handle, for sliding the bolt, and key-controlled means mounted in the second-named handle and coaxial therewith, for unlatching the bolt to permit its movement by the second handle to its unlocked position.

5. In a lock, the combination of a casing, a bolt mounted to slide in the casing, a handle at one side of the casing for moving the bolt, a spring for urging the bolt to its locking position, a latch mounted on the bolt, actuated by the rotation of the handle for engaging the casing to hold the bolt in its locking position, a second handle connected with the bolt on the opposite side of the casing from the first-named handle, said second handle having a tubular shank, and key-controlled means mounted in the said tubular shank for actuating the latch to release the bolt and permit its movement to its unlocked position.

6. In a door lock to cooperate with a keeper mounted in a door-jamb, the combination of a casing, a bolt mounted to slide in the casing and capable of moving into the keeper to lock the door closed, a handle on the inner side of the door attached to the bolt for moving the same, a spring urging the bolt to its locking position, means mounted on the bolt actuated by the rotation of the handle for positively latching the bolt in its locking position, and key-controlled means on the outer side of the door for controlling said last named means to release the bolt and permit its movement to its unlocked position.

7. In a door lock to cooperate with a keeper mounted in a door-jamb, the combination of a casing, a bolt mounted to slide in the casing and capable of moving into the keeper to lock the door closed, a spring urging the bolt toward its locking position, a dog pivotally mounted on the bolt for rotation on a transverse axis with respect to the bolt, fixed means on the casing for engaging the dog when the bolt is moved to its unlocked position, and thereby causing the rotation of the dog on its axis, and means associated with the dog for holding it against rotation thereafter to hold the bolt in its unlocked position.

8. In a door lock to cooperate with a keeper mounted in a door-jamb, the combination of a casing, a bolt mounted to slide in the casing and capable of moving into the keeper to lock the door closed, a spring urging the bolt toward its locking position, a dog pivotally mounted on the bolt for rotation on a transverse axis with respect to the bolt, fixed means on the casing for engaging the dog when the bolt is moved to its unlocked position, thereby causing the rotation of the dog on its axis, means associated with the dog for holding it against rotation thereafter to hold the bolt in its unlocked position, and means associated with the bolt and actuated by the keeper to release the last-named means to permit the spring to move the bolt to its locked position.

9. In a door lock to cooperate with a keeper mounted in a door-jamb, the combination of a casing, a bolt mounted to slide in the casing and capable of moving into the keeper to lock the door closed, a spring urging the bolt to its locking position, automatic means for latching the bolt in its unlocked position, a trip device including a pin of hard metal mounted to slide longitudinally in the bolt and having a projecting nose capable of projecting from the bolt for engaging the keeper, and means actuated by the said pin for releasing the automatic latching means.

10. In a lock, the combination of a casing, a bolt guided in the casing, a rotatable spindle mounted in the casing, a key lock casing carried by the bolt and located at one side of said first-named casing, said rotatable spindle having a recess in its end located within the key lock casing, a key plate mounted in the key lock casing and guided for longitudinal movement toward or from the said recess, said key lock casing having a key slot in line with the key plate to receive a key, and said key plate having distinctive serrations to cooperate with the key

and enabling the key when in engagement with the key plate to push the key plate into engagement with the said recess for rotating the spindle, and means for latching the bolt in its locking position, controlled by the rotation of said spindle.

11. In a lock, the combination of a casing, a bolt guided in the casing, a rotatable spindle mounted in the casing, a key lock casing carried by the bolt and located at one side of the first-named casing, said rotatable spindle having a recess in its end located within the key lock casing, a key plate mounted in the key lock casing and guided for longitudinal movement toward or from the said recess, said key lock casing having a key slot in line with the key plate to receive a key, and said key plate having distinctive serrations to cooperate with the key and enabling the key when in engagement with the key plate to push the key plate into engagement with the said recess for rotating the spindle, a spring associated with the bolt urging the same toward its locking position, and means for latching the bolt in its locking position, controlled by the rotation of said spindle.

12. In a lock, the combination of a case having sidewalls, each sidewall having a slot therein, a handle corresponding to each slot and mounted therein, a bolt carrying the handles and guided to slide in the casing, one of said handles mounted for rotation and latching means for latching the bolt in its locking position controlled by the rotation of the rotatable handles.

13. In a lock, the combination of a case having sidewalls, each sidewall having a slot therein, a handle corresponding to each slot and mounted therein, a bolt carrying the handles and guided to slide in the casing, latching means for latching the bolt in its locking position controlled by one of said handles, and key-controlled means associated with the other handle for controlling the latching means.

LEWIS E. WILLIAMS.