J. LAUGHLIN.

LOCK AND KEY.

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1,020,208. Patented Mar. 12, 1912.

Fig. 1.

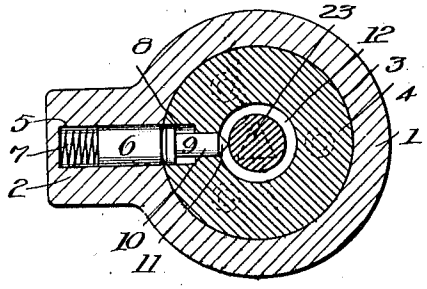


Fig. 2.

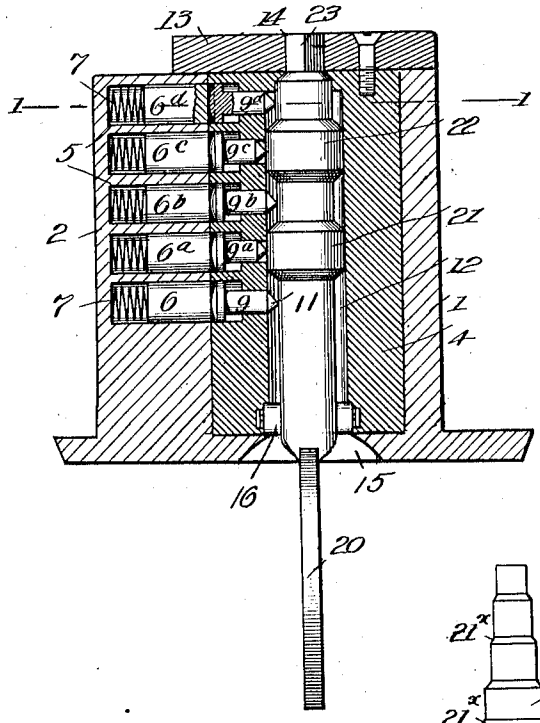
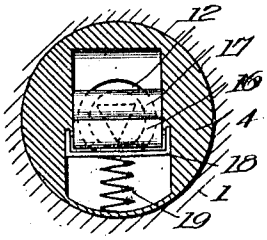


Fig. 3.



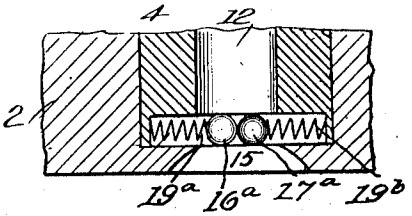


Fig. 4.

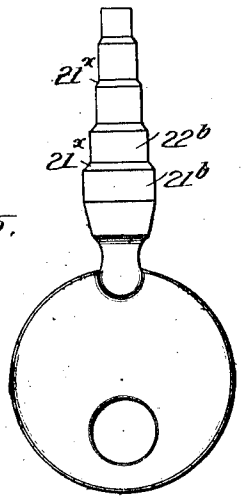


Fig. 5.

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LOCK AND KEY.

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To all whom it may concern:

Be it known that I, JUDSON LAUGHLIN, a citizen of the United States, and a resident of Ledyard, in the county of Kossuth and State of Iowa, have made certain new and useful Improvements in Locks and Keys, of which the following is a specification.

My invention relates to improvements in locks and keys and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a lock and key of such construction that the key may be inserted in any position when it will enter the lock and by further turning will operate it.

A further object of my invention is to provide a lock and key so constructed that the key may be withdrawn from the lock without the necessity of rotating it to its initial position.

A further object of my invention is to provide a guide way so as to center the key, so that if the point of the key is inserted at any other angle than at right angles to the lock, it will be guided at once into position, and upon further insertion and turning will operate the lock.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a section through the lock and key along the line 1—1 of Fig. 2, Fig. 2 is a section through the lock at right angles to Fig. 1, showing the key in position, Fig. 3 is an enlarged detail section through the barrel showing the spring rollers, Fig. 4 is a modified form of key hole closure, and Fig. 5 is a modified form of key.

In carrying out my invention I provide an exterior casing 1, which in the present instance is shown of cylindrical shape having an extension 2 at one side thereof. The casing 1 has a cylindrical bore 3 arranged to receive a cylindrical barrel 4. As clearly shown in Figs. 1 and 2 the extension 2 is bored out at 5 to provide for a plunger 6 which is normally held by a spring 7 against the barrel 6. The barrel 4 itself is bored out at 8 to receive a pin 9 whose end extends through a smaller bore 10 and has a conical point 11. As will be seen from Fig. 2 there are a number of these plungers, which are shown at 6, 6^a, 6^b, 6^c and 6^d, and each has its corresponding pin 9, 9^a, 9^b, 9^c, and 9^d. The points of the pins 9—9^d inclusive project normally into a cylindrical recess 12. One end of the barrel is secured to a plate 13 which is provided with an opening 14. This opening may be of a triangular or rectangular or any other shape to receive the end of the key for turning the barrel. The opposite end of the barrel is provided with a recess 15 which serves as a guide-member for guiding the point of the key in place. In order to cover the key hole, I arrange preferably the rollers 16 and 17. The roller 16 is provided with a slidable bearing 18, which is held in a forward position by means of a spring 19. The roller 17 may be similarly equipped. Instead of having the rollers carried by slidable bearings I may have them pressed directly upon by springs. Thus, in Fig. 4, the roller 16^a and the roller 17^a are pressed directly upon by the springs 19^a and 19^b.

In Fig. 2, I have shown a key which has been inserted in the recess 12. This key consists of a thumb-portion or handle 20, and is provided with enlarged portions 21 and 22 for the purpose of engaging the respective pins 9^a and 9^c, so as to force them into position for permitting the rotation of the barrel. The end of the key is of a triangular shape, as shown at 23, in Fig. 1, but it may be of any other suitable shape.

In Fig. 5 I have shown a modification of the key. In this figure the shank is provided with a series of cylindrical sections such as that shown at 21^b and 22^b, etc., each having a cam-surface 21^x.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. With a key fashioned according to my invention one may easily insert the key in the dark, since all that is necessary is to place the end of the key in the recess 15 when it will slide immediately into place. It is not necessary to turn the key in order to insert it, since it will enter at once into the recess 12. The portions 21, 22, 21^b, 22^b, etc., will immediately cam the tumblers or pins 9, 9^a, 9^b, etc. outwardly, thereby bringing them into alinement as shown in Fig. 2. The end of the key will enter the opening 13 in the plate 14 and now by turning the key the barrel may revolve, since the pins are all in alinement and the plungers 6—6^d are also in alinement. In inserting the key, the rollers

will be pressed apart against the action of the springs. When the key is now turned in either direction the barrel is turned with it and the lock (not shown) may thus be thrown. When it is desired to take the key out all that is necessary is to pull it out immediately. It does not have to be rotated into its original position in order to remove it.

It will thus be seen that I have provided a key and lock which will permit of the ready insertion of the key without the loss of time necessary to hold the key in a certain position. One reason that the lock and key will permit of this action is that the key, as far as its operating part is concerned, is symmetrical.

The key can evidently be made in numerous shapes and sizes and the cam surfaces can be varied. Thus, it will be almost impossible for one to make a key to fit a lock unless he has the original key, which was designed for the lock, before him.

I claim:—

1. The combination of a lock comprising a casing having an extension on one side thereof and being provided with a cylindrical bore, a cylindrical barrel disposed in said bore, said extension and barrel being provided with a series of bores arranged to register, a series of pins disposed in the bores in said barrel, a series of spring actuated plungers disposed in the bores in said casing and adapted to enter the bores of said barrel, said barrel being provided with a central bore intersecting the first mentioned bores, a cam plate secured to one end of said cylindrical barrel, said cam plate having an opening, a key having a cylindrical body portion, and cylindrical cam portions on said body portion arranged to engage the pins for operating said plungers, the key being provided with a reduced portion arranged to enter the opening in said cam plate.

2. In a lock, an exterior cylindrical casing, having an extension at one side thereof, said cylindrical casing being provided with a cylindrical bore, and said extension being provided with a plurality of cylindrical bores transverse of said main bore and communicating therewith, a cylindrical barrel disposed in the bore of said cylindrical casing, said cylindrical barrel being provided with radial bores adapted to register with the bores of said extension and having a central cylindrical bore communicating with said radial bores, a spring actuated plunger in each bore of the extension adapted to extend into one of the registering radial bores of the barrel, a separate plunger in each of the radial bores of the barrel, one end of each of said plungers being adapted to extend within the central bore in said barrel, a cam plate secured to one end of said barrel and being provided with an opening, and a key having cam surfaces arranged to enter the central bore of the barrel and having a rectangular end arranged to enter the opening in said cam member, a cam surface on said key being arranged to engage the ends of the plungers in the radial bores to force the ends of the plungers into registration with the outer surface of the cylindrical barrel.

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