April 16, 1940. R. ALBERTZ 2,197,673

KEY

Filed Oct. 19, 1937

Fig. 8.

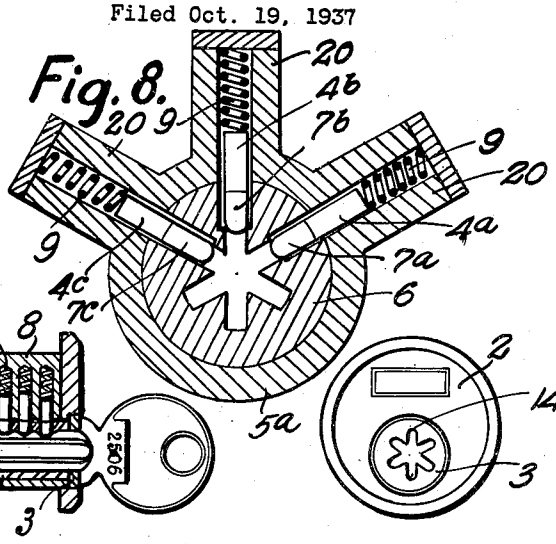


Fig. 1

Fig. 2

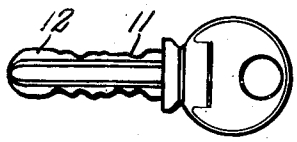


Fig. 3

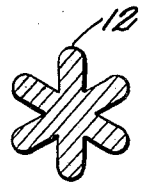


Fig. 4

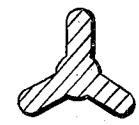


Fig. 5

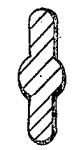


Fig. 6

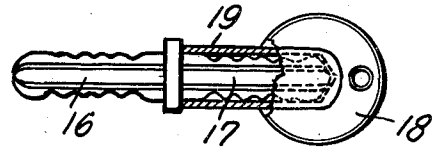


Fig. 7

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KEY

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2 Claims. (Cl. 70—395)

This invention relates to improvements in keys and locks and consists in providing a key with six, three or two blades which can operate six, three or two locks or one lock and incorporating in a single lock two or more combinations of pins which can be operated with the multiple blade key.

The various features and objects of the invention will be apparent to those skilled in the art upon a consideration of the appended drawing and the following description wherein several exemplary embodiments of the invention are disclosed.

In the drawing:

Figure 1 is a longitudinal sectional view of the lock showing a key having multiple blades positioned therein.

Figure 2 is a front view of the lock shown in Fig. 1 illustrating the nature of the opening provided in the key cylinder.

Figure 3 is a side view of a key having a plurality of blades.

Figure 4 is a cross sectional view through the stem of a key having six blades.

Figure 5 is a cross-sectional view of the stem of a key having three blades.

Figure 6 is a cross sectional view through the stem of a key having two blades.

Figure 7 is a side view partly in section of a key with a finger grip and reversible stem.

Figure 8 is a cross sectional view of a modified form of lock provided with a plurality of pin boxes.

Referring to the drawing there is represented in Figures 1 and 2 a cylinder 5 which is adapted to be fixed in the lock mechanism and is hereinafter referred to as the fixed cylinder. The cylinder 5 is provided with an opening for receiving the key cylinder 6 which is arranged to be rotated within the fixed cylinder 5. A collar 3 secured to the front end of the cylinder 6 is so arranged as to limit the inward movement thereof and a lock actuating arm 10 is rigidly fixed to the opposite end of the key cylinder. The key cylinder is provided with a number of radial openings for receiving a series of tumblers 7.

A pin box 8 is carried by the fixed cylinder 5 and the pin box may be formed from an integral part of the fixed cylinder. The pin box 8 is provided with a number of openings corresponding to those of the key cylinder 6 and a series of pins are arranged to be moved longitudinally in the openings of the pin box by means of the springs 9. The pins 4 urge the tumblers 7 downwardly so that the ends of the pins pass into the openings provided in the key cylinder 6 when the key 1 is removed from the lock so as to prevent rotation of the key cylinder 6 within the fixed cylinder 5.

The front end of the cylinder 5 and the pin box 8 are preferably covered by means of a circular disk 2 as shown in Figs. 1 and 2.

The present invention relates particularly to the key which is to be used for the operation of such a pin and tumbler lock as briefly described above. The axially extending opening provided in the key cylinder 6 differs however from the known type of lock by being provided with a plurality of radially extending grooves so as to permit a key having multiple blades to be inserted therein. One form of such an opening is illustrated in Fig. 2 wherein the key cylinder 6 is provided with six symmetrically arranged grooves so as to receive a key having six blades arranged along the stem thereof as shown in Figs. 3 and 4. Each of the blades is provided along the outer edge thereof with a number of notches 11 which are cut to such a depth and arranged in such a pattern as to cause the ends of the tumblers 7 to be aligned with the periphery of the key cylinder 6 when a particular blade of the six-bladed key is inserted in the vertical groove of a key cylinder. For example the blade 12 of the key shown in Figures 3 and 4 may be inserted in the groove 14 of the key cylinder 6 and the notches provided in the outer edge of the blade 12 will cause the pins 4 to be moved upwardly against the action of the springs 9 to such an amount as to permit the ends of the tumblers 7 to be aligned with the circumference of the key cylinder 6.

The six-bladed key may carry a different arrangement of notches on the outer edge of each blade so that when a blade is inserted in the vertical slot 14 of a lock having tumblers of different length and arrangement from that shown in Figure 1 it will be unlocked. In other words a key having six blades may be used to operate six different locks each having a single row of pins which vary with respect to each other lock.

A key having the stem portion thereof provided with three blades is shown in Figure 5 and the outer edge of these blades may be provided with notches to operate three locks having pin and tumbler combinations which differ from each other each having only one row of pins. The key shown in Fig. 6 is provided with two blades which may be similarly cut to unlock two such separate locks.

The invention further includes a key having a

reversible stem and multiple blades so that the number of locks that may be operated by an individual key are further increased. For example such a key is shown in Fig. 7 having two stem portions 16 and 17 and each of these stem portions is provided with a plurality of radially arranged blades. Each of the blades of the stem portion 16 may be provided with a series of notches in the outer edge thereof so that each of the blades may be employed to operate a particular lock having a single line of tumblers. The stem portion 17 may be removed from the finger grip 18 and the stem portion 16 may thereafter be inserted in the casing 19 of the finger grip. Each of the blades of the stem portion 17 may also be provided with a different series of notches so that each blade may be employed to actuate still further locks of the type shown and described in connection with Fig. 1.

A further feature of the invention resides in the provision of a number of pin boxes on the fixed cylinder and such an arrangement is illustrated in Fig. 8. In this modification of the lock the fixed cylinder 5*a* is provided with a number of pin boxes 20 circumferentially displaced therearound so as to be in radial alignment with the grooves provided in the key cylinder 6. Each pin box is provided with a series of pins and tumblers.

The pins 4*a* and the tumblers 7*a* may be of such length as to provide a series adapted to have the ends thereof aligned with the periphery of the cylinder 6 by one blade of the key. The pins 4*b* and 7*b* may be arranged in such a combination as to have the ends meet at the circumference of the key cylinder 6 by another blade of the key. In a like manner the pins 4*c* and the tumblers 7*c* may be actuated to cause the outer ends of the tumblers 7*c* to match the periphery of the key cylinder 6 when the third blade of a key properly serrated is inserted in the axial opening of the key cylinder.

The lock illustrated in Fig. 8 is designed for the reception of a key having six blades provided on the stem thereof and it will be appreciated that the security provided by such a lock is increased since three sets of pins and tumblers must be moved before the key cylinder 6 can be turned in the fixed cylinder 5*a*. Any number of pin boxes can be provided on such a lock and it will be apparent that the axial opening of the key cylinder may be arranged to receive a key having three blades or two blades with the pin boxes thereof arranged to be in radial alignment with the grooves which receive the multiple blade key.

Although certain preferred embodiments of the invention have been disclosed it is apparent that further modifications may be made by those skilled in the art. Such modifications may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A key adapted for use in locks of the type having a series of spring-actuated pins and tumblers comprising, a key body consisting of stem portions, said stems each having a plurality of blades extending longitudinally thereof, each blade projecting radially from the axis of the particular stem in planes circumferentially displaced with respect to each other, the outer edge of each blade having a series of notches therein and the notches of one blade differing in depth and arrangement with respect to the depth and arrangement of the notches of each other blade, and a finger-grip member having a casing adapted to fit over either stem portion.

2. A key adapted for use in locks of the type having a series of spring-actuated pins and tumblers comprising, a key body consisting of two axially aligned stem portions, said stems each having a plurality of relatively thin blades extending longitudinally thereof, each blade being formed integral with the respective stem and projecting radially from the axis of the stems in planes circumferentially displaced with respect to each other, the outer edge of each blade having a series of notches therein and the notches of one blade differing in depth and arrangement with respect to the depth and arrangement of the notches of each other blade, and a finger-grip member having a casing for receiving therein either stem portion so as to provide means for gripping and turning the key.

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