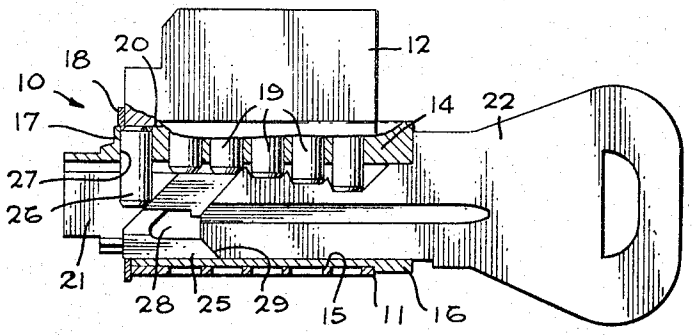
Oct. 4, 1966 F. J. RUSSELL ETAL 3,276,233

KEYWAY STOP

Filed June 8, 1964

Fig. 1



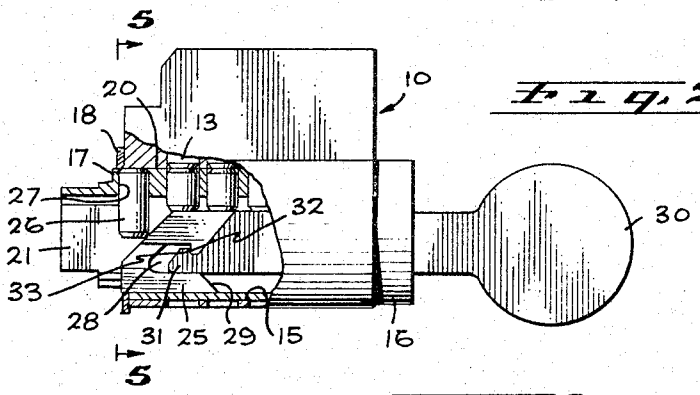
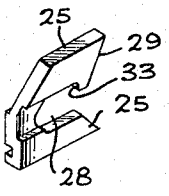


Fig. 2

Fig. 3

Fig. 6



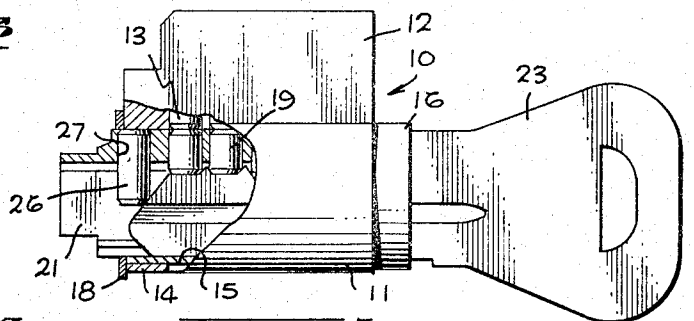


Fig. 4

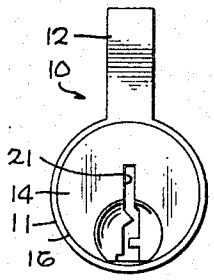
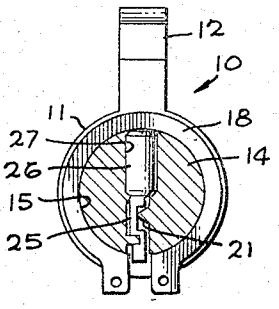


Fig. 5



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KEYWAY STOP

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1 Claim. (Cl. 70—382)

The invention here under consideration relates to door locks wherein there is incorporated a selective keying system of a type currently popular for use while a building is in the course of construction, making it possible for locks to be installed as soon as possible to secure the premises, but with an arrangement such that workers on the job may be provided indiscriminately with keys capable of being used during the construction period and such that the lock can be easily changed after construction is completed, thereby to make all of the keys which have been handed out to building workers useless.

In applicants' co-pending application Serial No. 250,332, filed January 9, 1963, and now abandoned there has been disclosed a selective keying device which makes use of an obstruction at the inner end of the keyway to shorten the keyway during the temporary construction period, and which is designed to be removed by a special tool at the end of the construction period for the purpose of rendering construction keys useless. When an obstruction type of selective keying system is used with a lock possessed of an open keyway; that is to say, a keyway which is cut entirely through the key plug from end to end, there may be insufficient backing for the obstruction when the tool is pushed into engagement with it to prevent it from being pushed out the inner end of the keyway before it is properly engaged by the tool.

It is, therefore, among the objects of the invention to provide a new and improved selective keying device useful especially with open keyway locks which allows full advantage to be taken of a selective keying system predicated upon the keyway obstruction and which, at the same time, makes certain that the system will always operate satisfactorily.

Another object of the invention is to provide, in a new and improved keyway obstruction system of selective keying, a construction for assuring the success of the device which is very simple, which can be easily and accurately constructed, and which because of its simplicity and the limited number of structural parts does not add appreciably to the cost of the lock.

Still further among the objects of the invention is to provide in a keyway obstruction system for selective keying, a device for firmly anchoring the obstruction at its innermost position, such that there need be no appreciable structural change in the lock itself and in that way to take full advantage of the simple and inexpensive construction.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claim and illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a longitudinal sectional view of a lock provided with an obstruction type selective keying system, showing the obstruction in position against an appropriate stop.

FIGURE 2 is a side elevational view partially broken away, showing a special tool in the process of engaging the obstruction.

FIGURE 3 is a view similar to FIGURE 2, showing the position of an owner key in the lock after the obstruction has been removed.

FIGURE 4 is a front end elevational view of the device.

FIGURE 5 is a cross-sectional view taken on the line 5—5 of FIGURE 2.

FIGURE 6 is a side perspective view of the obstruction.

In an embodiment of the invention which has been chosen for the purpose of illustration, there is shown an obstruction type selective keying lock device indicated generally by the reference character **10**. The lock device consists of a casing **11** on one side of which is a pin tumbler housing **12** adapted to contain pin tumblers like the pin tumblers **13**, visible in FIGURES 2 and 3. A cylinder plug **14** is rotatably mounted in a cylinder plug recess **15** in the casing **11** and is provided with a collar **16** at the outer end. A projection **17** at the inner end of the cylinder plug **14** protrudes outwardly with respect to the inner end of the casing **11**, and a snap ring **18** is employed to hold the cylinder plug **14** in assembled position in the casing **11**.

In the cylinder plug **14** is a series of pin tumblers **19** which are in alignment respectively with the pin tumblers **13** and function in the customary fashion by allowing the cylinder plug **14** to be rotated to an unlocked position when respective pin tumblers **19** and **13** match at a shear line **20**. Also in the cylinder plug **14** is a keyway **21** which extends entirely through the cylinder plug **14** from front to back.

Two types of keys are adapted for insertion into the keyway **21**, namely, the construction key **22**, shown in FIGURE 1, and the owner key **23**, shown in FIGURE 3. When the construction key **22** is being used, an obstruction **25** occupies a position at the innermost end of the keyway **21** and holds the two innermost pin tumbers **19** in positions so that their upper ends coincide with the shear line **20**. Under these circumstances, the construction key **22**, which is relatively short, operates with the three outermost pin tumblers **19** in order to move them upwardly to a position where their upper ends coincide with the shear line **20**, so that the lock can be unlocked by employment of the construction key **22**.

In order to fix the position of the obstruction **25**, a stop in the form of a stop pin **26** is employed. To properly position the stop pin **26**, an aperture in the form of a pin recess **27** is drilled in the cylinder plug **14** at its innermost end. It is advantageous to drill the pin recess **27** at a location in alignment with recesses for the pin tumblers **19** and preferably in the same operation, the pin recess **27** being drilled sufficiently deep in the cylinder plug **14** so that it passes across most of, if not all of, the cross-section of keyway **21**. The stop pin **26** is then projected into the pin recess **27**, and is prevented from moving upward because there is no matching recess in the casing **11**. The stop pin **26** is, therefore, in position when the subassembly of the cylinder plug **14** and its pin tumblers **19** is completed, the stop pin **26** being in position when the cylinder plug **14** is inserted into the casing **11** and there fastened in place. The stop pin **26** in this fashion establishes the length of the keyway **21** for all purposes with which the invention here under consideration is concerned. That is to say, it determines the innermost position of the obstruction **25** as shown in FIGURES 1 and 2 and also determines the length of the keyway **21** when the owner key **23** is inserted in the lock, as shown in FIGURE 3.

The obstruction **25** has an outwardly facing engagement opening **28**, the entrance of which is defined by a smooth walled, lead-in opening **29**. While the obstruction **25** is in position in the cylinder plug **14** as shown in FIGURES 1 and 2, only the construction key **22** can be used, and this practice continues as long as the obstruction **25** remains in place. When the time comes to change the keying of the lock, a tool **30** is made use of. The tool **30** is

so shaped that it can be slid into the keyway 21 into a position of engagement with the obstruction 25. To make engagement possible, there is provided at the inner end of the tool 30 an end projection 31 on which is an outwardly facing shoulder 32. The end projection 31 is adapted to be forced into the engagement opening 28 of the obstruction 25, springing opposite sides of the obstruction 25 away from each other resiliently until the shoulder 32 falls behind a complementary shoulder 33.

It will be understood that if the obstruction 25 is to remain properly in place at the inner end of the keyway 21, it must fit snugly enough that it will not jar out of the keyway 21 during this period of use. Also, in order to make certain that the end projection 31 of the tool 30 can engage the obstruction 25 firmly enough to assure withdrawal of the obstruction 25 when the need arises, the engagement must be a positive one. To make certain of this, the material of the obstruction 25, although flexible, is made reasonably resistant so that it takes some appreciable force, pushing the tool 30 inwardly, to force the end projection 31 into the engagement opening 28. Therefore, the obstruction 25 must be so positioned as to resist being pushed inwardly, and this, in turn, is accomplished by the presence of the stop pin 26. Firmly anchored in position as shown and described, the stop pin 26 positively fixes the innermost position of the obstruction 25 for the purpose just described. There is, accordingly, no likelihood of the obstruction 25 being pushed inwardly out of the innermost end of the open keyway 21 when an open keyway type of cylinder plug is employed.

After the obstruction 25 has been withdrawn outwardly by employment of the tool 30 to clear the keyway 21, the owner key 23 may then be employed in the keyway 21, as shown in FIGURE 3 and can be used thereafter to manipulate the lock. When this happens, construction keys 22 are no longer useful because they are not long enough to extend into the full length of the keyway 21 to properly set the two innermost pin tumblers in the position they need to occupy to coincide with the shear line 20, thereby to permit the cylinder plug 14 to be rotated to lock opening position.

From the foregoing description, it will be apparent that the amount of material involved in providing the stop pin 26 is virtually negligible, and the only added operations necessary to place it in position are drilling of an extra pin hole simultaneously with the drilling of the normal pin tumbler recesses and the assembly of the stop pin 26 in the pin recess 27.

While the invention has herein been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claim so as to embrace any and all equivalent devices.

Having described the invention, what is claimed as new in support of Letters Patent is:

A key-operated mechanism of the kind including a casing, a cylinder plug rotatable in said casing and having a keyway therein extending through said plug from end to end, and a series of movable tumblers in said casing and cylinder plug for locking said cylinder plug against rotation and adapted to be moved by a key inserted through said keyway from the front of the cylinder plug, said tumblers allowing rotation of the cylinder plug when each tumbler is in released position, an obstruction in said keyway and engaging at least one of said tumblers to shorten said keyway, and a tool adapted to extend into the keyway and withdraw said obstruction, said obstruction and said tool having complementary interlocking elements at mating ends thereof whereby said tool is engaged with said obstruction to enable withdrawal of said obstruction outwardly through the keyway, and stop means in the keyway abutting said obstruction to limit inward movement of said obstruction, said stop means consisting of a radial opening extending from the exterior of said cylinder plug into said keyway at a location within the casing and inwardly relative to the innermost tumbler, a stop element extending into said keyway, and means securing said stop element against any movement in said opening.

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