# United States Patent [19]

**Oliver et al.**

[11] **3,713,311**

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## [54] DETACHABLY FIXED CYLINDER LOCK CORE


[76] Inventors: **Roy N. Oliver,** 148 Ellen Drive; **Roy C. Spain,** P.O. Box 1668, both of Salem, Va. 24153



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[52] **U.S. Cl.** ..... **70/369**

[51] **Int. Cl.** ..... **E05b 35/14**

[58] **Field of Search** ..... 70/369, 367, 368, 370, 371, 70/451



[56] **References Cited**

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*Primary Examiner*—Robert L. Wolfe

*Attorney*—John B. Sponsler



[57] **ABSTRACT**

A cylinder lock core mechanism for insertion into and becoming detachably fixed to a lock housing under control of a special key operating upon a special tumbler in the key plug, the core being retained by a slidable retaining lug emerging through the surface of the core and being retractable by operation of the special key's rotation to cause the tumbler to coact with the retaining lug permitting the core to be withdrawn from the housing — including a deadlock member coacting with the retaining lug under control of the key plug and guiding studs in the core structure whereby the member is cammed to free the retainer for movement only upon rotation of the key plug by the special key.


**3 Claims, 5 Drawing Figures**

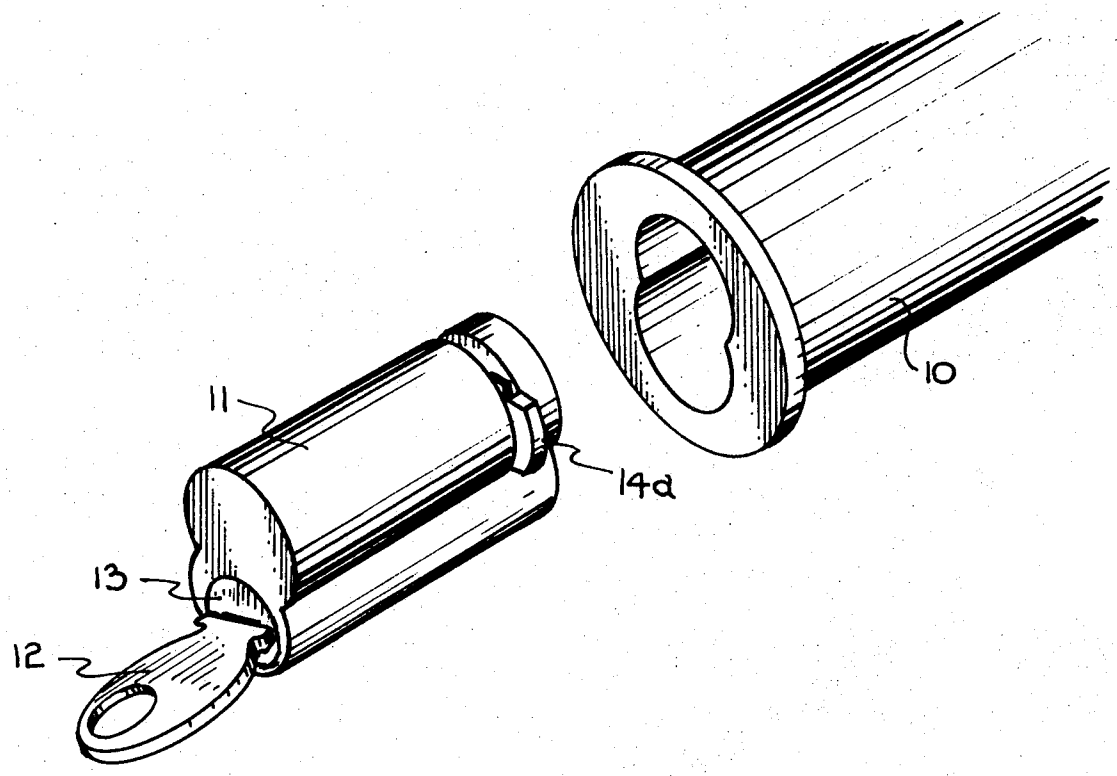
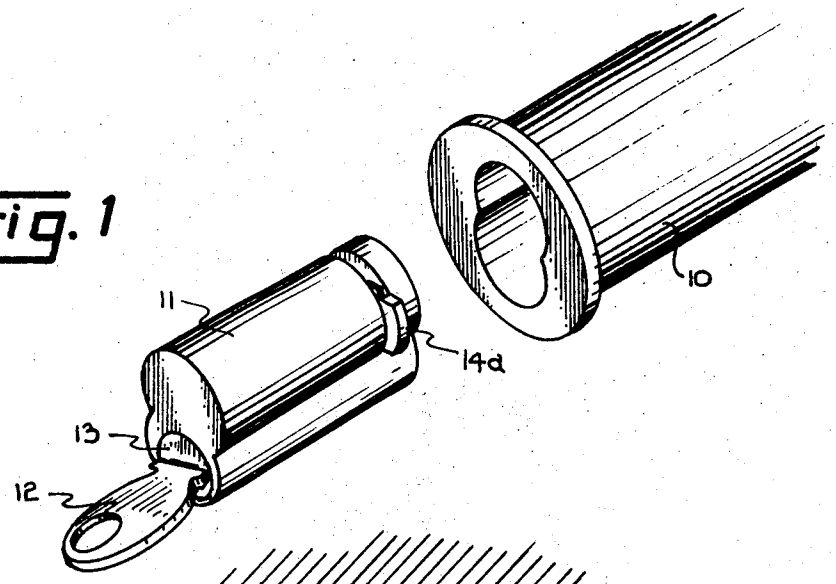


Fig. 1



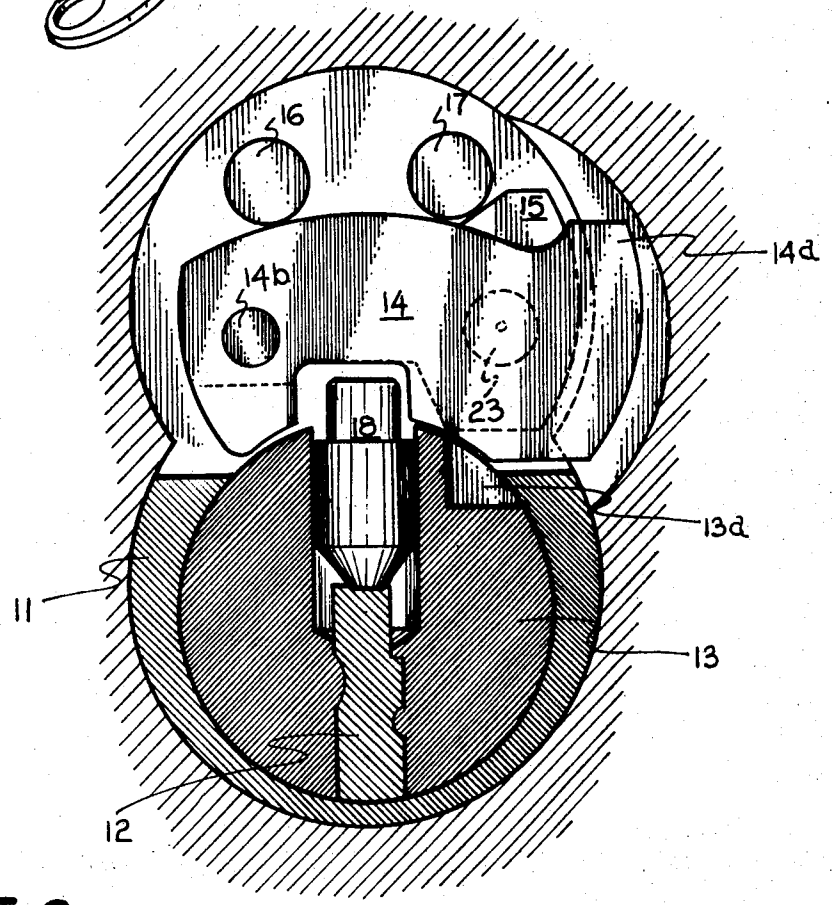
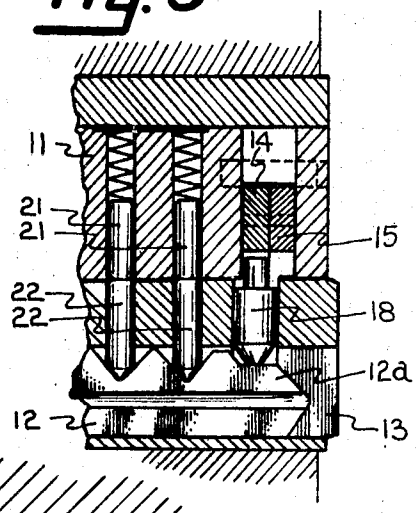




Fig. 2

INVENTORS
ROY N. OLIVER
ROY C. SPAIN

Fig. 5



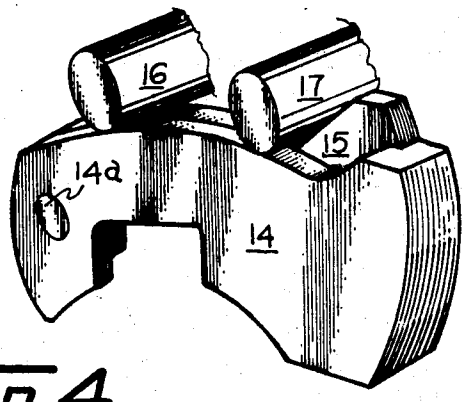




Fig. 4

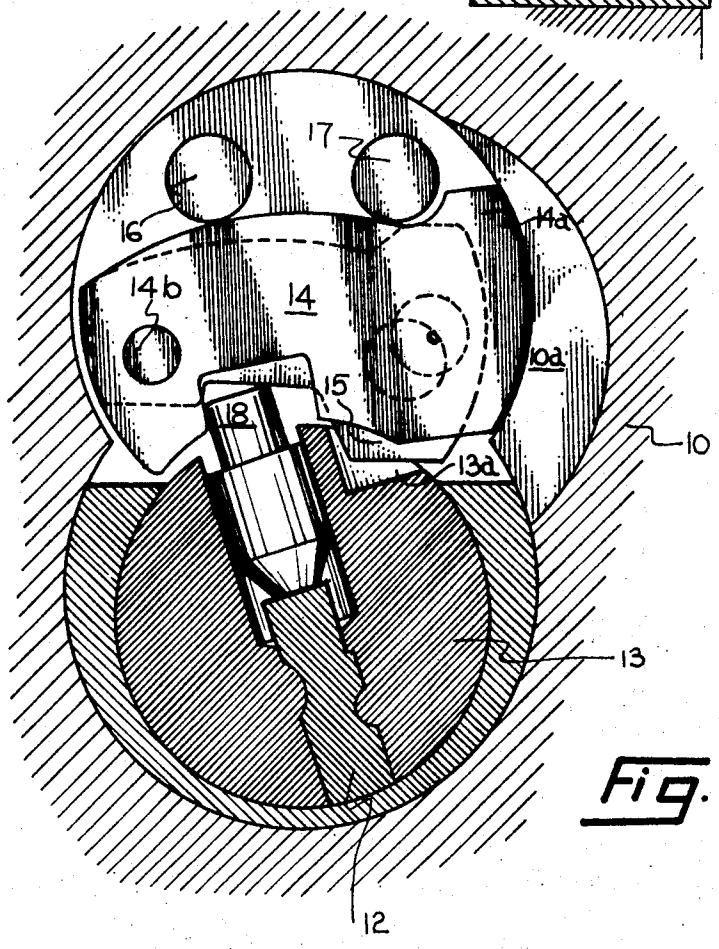



Fig. 3

*INVENTORS*
ROY N. OLIVER
ROY C. SPAIN.

# DETACHABLY FIXED CYLINDER LOCK CORE

## BACKGROUND OF THE INVENTION

Conventional cylinder locks carried by doors and the like frequently are required to be changed for security purposes, or for changing combinations; consequently, it is desirable to have an arrangement whereby the lock core may be removed without taking out the lock housing. This has brought about the so called "removable core" type of lock similar to that illustrated in U.S. Pat. No. 1,964,787 wherein a special key operating upon a special tumbler coacts with the mechanism to permit the lock core to be removed from its housing for replacement.

As also shown in U.S. Pat. Nos. 1,986,676 and 2,122,478 the mechanism normally involved is essentially a latch or cam extending from the core into a cavity of the housing under control of the key plug's rotation in combination with a special key fitted to the plug.

## SUMMARY OF THE INVENTION

The present invention relates to an improved type of removable core having a positive and simplified mechanism for detachably fixing the lock core in the lock housing with the further improvement of a "-deadlatch" mechanism whereby the lock can not be picked readily by rapping or the like. More specifically, a sliding type of core retainer, or latch, is provided to emerge from the core to engage the lock housing and an auxiliary member coupled to the retainer is positively confined to a position between the key plug and the core strueture until the key plug is rotated thereby holding the retainer in locked position in the housing.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the removable core and the lock housing into which it is detachably fixed.

FIG. 2 is a sectional view of the mechanism within the core which is key operated to provide for the emerging of the core retainer into the lock housing.

FIG. 3 illustrates the functioning of the mechanism of FIG. 2 in order to withdraw the core retainer from the lock housing.

FIG. 4 is a detailed perspective of the principal structure of the retainer and its auxiliary member coupled thereto.

FIG. 5 is a sectional view taken longitudinally of the core structure to illustrate the action of the key and key plug in cooperation with both the actual locking tumblers and the special tumbler for controlling the core retaining mechanism.

## DETAILED DESCRIPTION

Referring to FIG. 1 a cylindrical lock housing **10** is provided with an hour-glass shaped opening into which a lock core **11** may be inserted axially under control of a key **12** and a key plug **13** to cause a retainer lug **14***a* to engage a recessed portion within the lock housing **10**. As shown in FIG. **1** a rotation of the key **12** clockwise will cause the lug **14***a* to emerge from the core **11** and a counter-clockwise rotation of the key will cause the lug to be retracted into the core. Obviously when the lug **14***a* has emerged from the core **11** and has entered the housing **10** recesses portion the core can not be removed.



Referring now to FIG. 2, which is a sectional view taken transversely through the core **11** (when it has been inserted into the housing **10**) just forward of the lug **14***a*, it is to be noted that the lug is in its emerged position with the recessed portion **10***a* of the housing **10**. Attention is also invited to FIG. **4** to understand the internal structure of the core **11**, which consists of the retainer **14** having having the lug **14***a* at one end and having a pin **14***b* at the opposite end loosely joined to a T-shaped member **15**. When the core **11** is in its retained position, therefore, as shown in FIG. **2**, the retainer **14** is confined by some studs **16** and **17** at its upper edge and by the key plug **13** at its lower extremeties. However, since the retainer **14** is pinned to the member **15**, which is rigidly held between the stud **17** and the key plug **13**, the core **11** remains firmly in its retained position. In other words, the member **15** provides a deadlatch against random displacement of the retainer **14**.

Reference is now made to FIGS. **2**, **3** and **5**. It is well known in the prior art to use a special key, such as key **12** having an extra tip **12***a* for coacting with a special tumbler such as tumbler **18**, wherein the special key also operates the normally operative lock tumblers, such as the tumblers **22** and their risers **21** (See FIG. **5**) to lock and unlock the mechanism. The tip **12***a* in the present invention functions to cause the special tumbler **18** to be cammed out of the key plug **13** (See FIG. **2**) so that rotation of the key **12** (counter-clockwise as in FIG. **2** and FIG. **3**) causes the tumbler **18** to move against the toe of retainer **14**, which via the pin **14***b* pulls the member **15** to be cammed downward by the stud **17** as rotation of the key plug **13** permits the free end of member **15** to enter the cavity **13***a* in the key plug **13** (See FIG. **3**) so that the lug **14***a* is withdrawn from the recessed portion **10***a* of the housing **10**, and the core **11** can then be withdrawn from the housing.

To replace the core **11** into the housing **10** a reverse procedure is followed, the key being rotated clockwise whereby the retainer **14** is slided to the right (as viewed in FIG. **2**) and the lug **14***a* again emerges from the core **11** and slide into the recessed portion **10***a*.

The key normally used to "lock" and "unlock" the lock does not have an extra tip such as the tip **12***a*, and under some conditions as the key plug **13** is turned the lower end of member **15** may begin to enter the cavity **13***a;* however, such action will not move the retainer **14** without a positive movement of tumbler **18** (e.g., per key tip **12***a*), a detent **23** may be provided to retain member **15** normally in the position shown by FIG. **2**. Similarly, a spring (not shown) may be provided to retain tumbler **18** normally seated in the key plug **13**, permitting the tumbler **18** to emerge only when cammed by the key tip **12***a*.

A unique feature of the invention resides in the combination of the retainer **14** and the member **15** wherein the former is positively locked into the housing **10** by its coupling with member **15** which is confined between the stud **17** and the key plug **13** so that rapping, or other vibrations tending to release the retainer lug **14***a* from the recessed portion **10***a*, has no effect in reducing the security of the lock.

What is claimed:

1. A cylinder lock core capable of being detachably fixed within a lock housing comprising a key plug, a slidable retainer for engaging a recessed portion of said

housing, said retainer being constrained within said core by a pair of guiding studs and said key plug, a tumbler within said key plug capable of being displaced by introduction of a key into said plug to engage and move said retainer upon rotation of said key, and a member coupled to said retainer for locking positively said retainer against random movement.

2. The invention claimed in claim 1 wherein said coupling member is confined between said guiding studs and said key plug.



3. The invention according to claim 2 wherein said coupling member is released from said confinement through a coacting notch in said plug as the latter is rotated by said key.

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