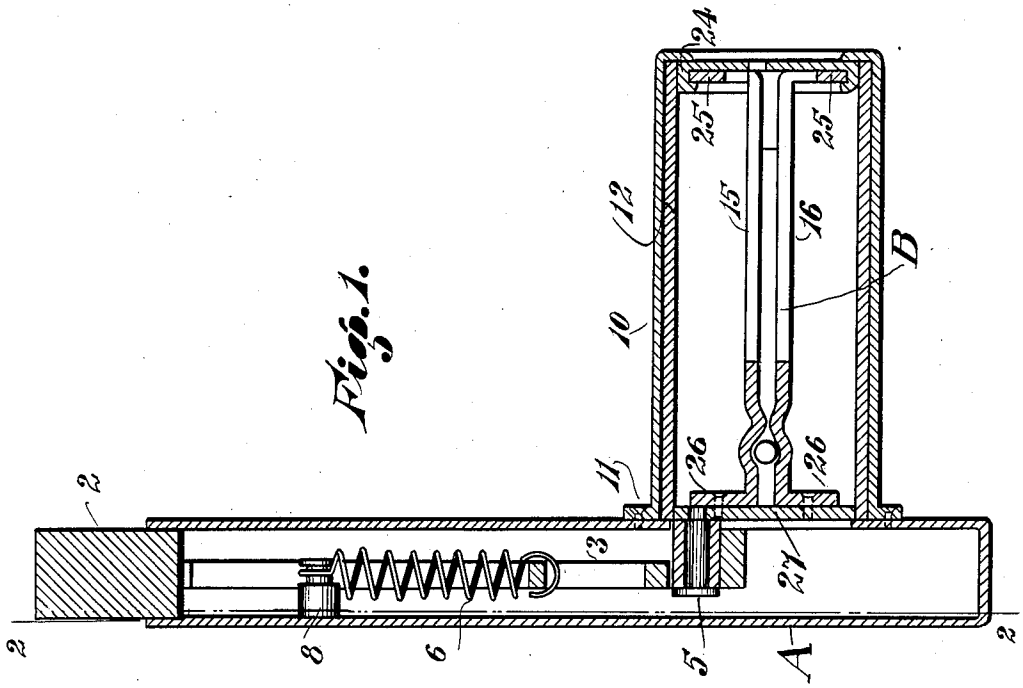
Dec. 20, 1927. 1,653,511

W. R. SCHLAGE

LOCK

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Fig. 1.



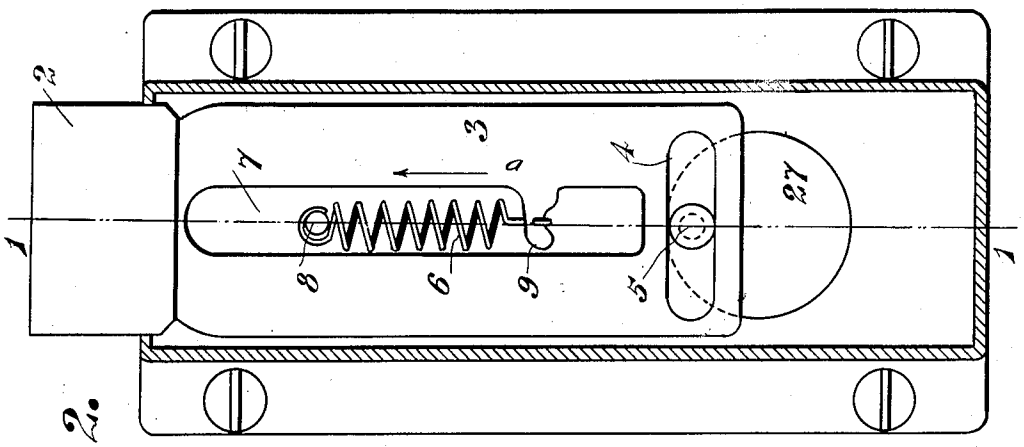


Fig. 2.

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Fig. 3.

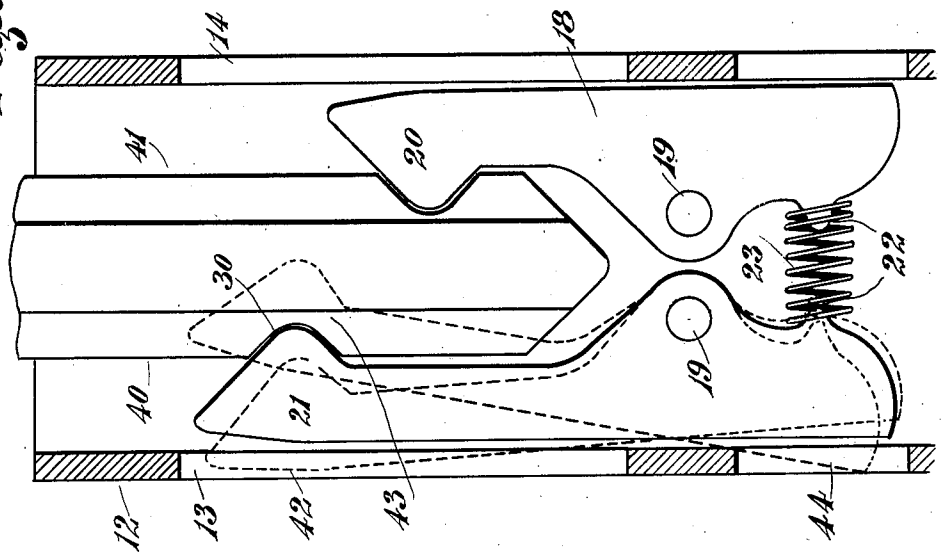


Fig. 4.

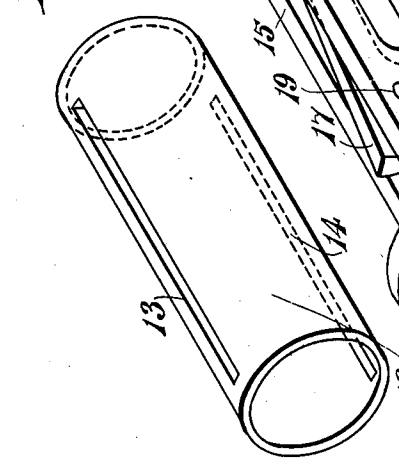


Fig. 5.

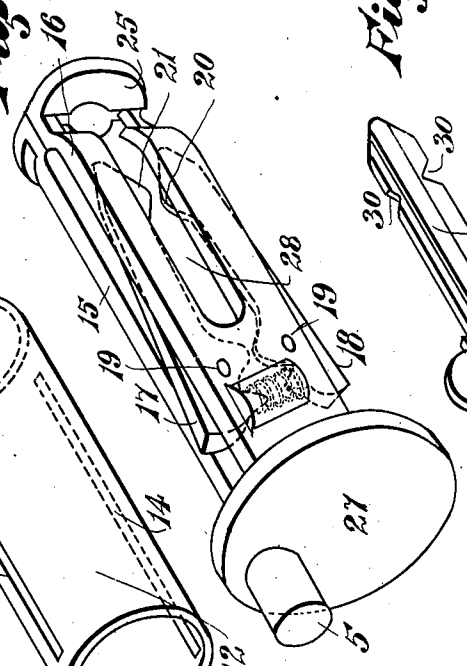


Fig. 6.

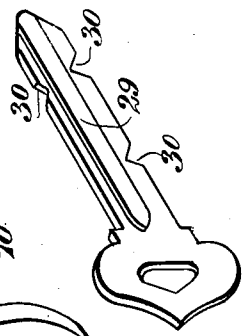
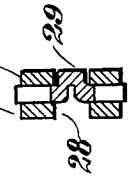


Fig. 7.



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UNITED STATES PATENT OFFICE.

WALTER R. SCHLAGE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO SCHLAGE LOCK COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

LOCK.

Application filed May 9, 1923. Serial No. 637,638.

This invention relates to locks and especially to a key-actuated lock of the tumbler type.

The object of the present invention is to generally improve and simplify the construction and operation of locks of the character described, and especially to provide a rocking type of tumbler whereby a bolt, latch or the like, may be actuated.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a section on line 1—1, Fig. 2.

Fig. 2 is a vertical section on line 2—2, Fig. 1.

Fig. 3 is an enlarged fragmentary detail view showing the rocking tumblers and the key whereby they are actuated.

Fig. 4 is a perspective view of the barrel.

Fig. 5 is a perspective view of the tumbler carrier.

Fig. 6 is a perspective view of the key.

Fig. 7 is a cross-section on line 7—7, Fig. 5.

Referring to the drawings in detail, and particularly to Figs. 1 and 2, A indicates an ordinary lock housing, in which is slidably mounted a latch or keeper 2. Forming an extension of the keeper is a plate 3, and formed in one end thereof is a transverse slot 4 through which projects a pin 5.

The latch 2 is normally held in a projected position by means of a spring 6. This spring is disposed in a central longitudinal slot 7 formed in the plate 3, one end of the spring being secured to a pin 8 which in turn is secured to the lock casing A, and the opposite end of the spring being secured to a lug 9 forming a part of the plate 3. With the spring arranged as shown, it can be seen that a pull is exerted in the direction of arrow *a*, and that the latch or keeper 2 will under ordinary conditions assume a projected position.

The mechanism so far described merely illustrates an ordinary form of lock, said illustration and description being made only for the purpose of showing one of the uses of the key-actuated locking mechanism, which forms the subject-matter of the present application. The key-actuated locking mechanism is best illustrated in Figs. 1, 3, 4, 5, 6 and 7. This mechanism is contained in a cylindrical housing 10 secured to one side of the main lock housing A, as indicated at 11.

Secured within the lock housing and snugly fitting the same is a locking barrel 12, and formed in said barrel are two longitudinally disposed slots 13 and 14. (See Figs. 3 and 4.) Turnably mounted within the barrel 12 is a tumbler carrier, which is generally indicated at B. (See Figs. 1 and 5.) This carrier consists of a pair of interspaced plates 15 and 16 which extend from end to end of the barrel 12, and which form a support for a pair of rocking tumblers, generally indicated at 17 and 18. These tumblers are pivotally mounted between the plates 15 and 16, as indicated at 19, and they serve the function of normally locking the tumbler carrier with relation to the barrel 12. The tumblers are perhaps best illustrated in Figs. 3 and 5. They are elongated as shown. Their forward ends terminate in cam-shaped heads, such as indicated at 20 and 21, while their opposite ends terminate in lugs 22 between which is disposed a helical tension spring 23; this spring serving the function of normally maintaining the tumblers in locking position; that is, the tumbler carrier and the tumblers supported thereby normally align with the slots 13 and 14 formed in the barrel and as this is the case one end or another of the respective tumblers will be projected into the slots and as such will lock the tumbler carrier against rotation.

Secured on the outer end of the plates 15 and 16, which forms the main frame of the tumbler carrier, is a circular disk 24. This disk forms a bearing for one end of the tumbler carrier and it also serves the function of a guide for a key such as shown in Fig. 6; that is, the face of the disk is slotted to permit insertion of the key. The plates 15 and 16 terminate in laterally extending foot lugs, such as indicated at 25. These lugs terminate in semi-circular ends as shown in Fig. 5, and the disk 24 is, therefore, merely crimped over the edges of the lugs 25, thus forming a simple manner for securing the members 15 and 16 with relation to the disk, and at the same time permitting the disk to serve as a bearing and as a key guide therefor. The opposite ends of the plates 15 and 16 similarly terminate in foot lugs, such as shown at 26; these lugs being secured to a circular disk 27, which will hereinafter be referred to as a rotating head, as this

disk serves the function of supporting the pin 5 whereby the latch or keeper 2 is actuated.

A longitudinal slot is formed in each of the plates 15 and 16, as indicated at 28. These slots are of considerable importance as they form a guide for the key, and furthermore prevent rocking or tilting of the key when inserted; that is, one side of the key is offset, as at 29, (see Figs. 6 and 7) to form a projection which will enter one or another of the slots 28 and when it so enters, it can readily be seen that tilting of the key will be prevented and that an efficient guide will be provided therefor. The face of the key may be indented or recessed in one or more places, as shown at 30, but such recesses or indentations must be positively located to permit registration with the cam ends 20 and 21 of the respective tumblers.

The operation will be as follows:

If it is desired to open the lock it is first necessary to insert the key through the slot formed in the disk 24. The key, when inserted to the position shown in Fig. 3, will cause the tumblers to assume a parallel position with relation to the plates 15 and 16 and also with relation to the inner surface of the locking barrel 12, and, when this parallel position of the tumbler is assumed, it is possible to freely rotate the tumbler carrier. The head member 27, which is secured to the tumbler carrier, will, therefore, rotate in unison with the same, and as pin 5 is secured to the head member 27 and projects through the slot 4 in the plate 3, it can be seen that the latch or keeper 2 will either be retracted or projected, as the case may be; a one-half revolution in either direction being sufficient to retract or project the latch 2. It will furthermore be seen that the latch may be locked either in a retracted or a projected position as it is impossible to remove the key except when one of the positions referred to is assumed; that is, any attempt to retract the key before the tumblers 17 and 18 align with the slots 13 and 14 will be frustrated as no rocking movement can be imparted to the tumblers except when they align with the slots. The key may, however, be retracted or removed from the tumbler carrier when the latch is completely retracted as the tumblers will then align with the slots in the locking barrel, and the key may, similarly, be retracted or removed from the tumbler carrier when the latch is fully projected as the tumblers will then align with the slots in the locking barrel; that is, the cams 20 and 21 formed on the respective tumblers 17 and 18 ride on the edges of the key indicated at 40 and 41. When riding on the high surfaces, the tumbler 17 will assume the dotted line position indicated at 42, and when assnming this position projects into the slot 13. When the key is fully inserted, recess 30 aligns with the cam 21 and as a consequence the tumbler 17 assumes a parallel position with relation to the key and the locking barrel, thus permitting rotation of the tumbler carrier, providing, tumbler 18 also assumes a parallel position. When the key is retracted the tumbler 17 assumes the dotted line position indicated at 43 and the opposite end of the tumbler or that indicated at 44 will then be projected into the slot 13 in the locking barrel, and as such will again secure the tumbler carrier against rotation, the position shown at 43 being maintained when the key is removed due to the pressure exerted by the spring 23, and the position 42 being assumed when the cam 41 rides on the outer edge or surface 40 of the key.

A great number of combinations can be produced by employing a tumbler arrangement such as here shown. For instance, a long and short tumbler, such as shown at 17 and 18, in Fig. 3, may be employed; that is, the tumbler 17 may be maintained a constant length, while the length of the tumbler 18 may be increased or decreased. Again, a constant length may be maintained, as far as the tumbler 18 is concerned, and the length of the tumbler 17 may be increased or decreased. Further, both tumblers may be increased or decreased and their length maintained uniform. Again, it is possible to form two or three cam projections, such as indicated at 20 and 21, or it is possible to make two or more cam projections on one or either tumbler, and as this is the case it is obvious that unlimited combinations may be obtained.

While the present invention shows a key-actuated tumbler mechanism as applied in a specific manner to a bolt or latch type of lock, I wish it understood that this is merely for the purpose of illustration as it is obvious that the tumbler mechanism here illustrated may be applied to a great variety of locks and that the pin 5 may, therefore, in a great many instances be entirely eliminated. I also wish it understood that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate or various uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a lock of the character described, a housing, a cylindrical sleeve secured therein, said sleeve having a pair of longitudinally disposed slots formed therein which are diametrically opposite, a tumbler carrier rotatable in the sleeve, said carrier consisting of a pair of parallel interspaced plates, a disk-shaped head secured at one end of the plates and having a crank pin mounted thereon, a pair of tumbler plates disposed

between the tumbler carrier plates, a pivotal support for the tumbler plates disposed substantially midway between their ends, lugs on the inner ends of the tumbler plates, and a spring interposed between the same and normally projecting the inner ends of the tumbler plates into the slotted portions of the sleeve.

2. In a lock of the character described, a tumbler carrier consisting of parallel interspaced plates, elongated tumbler members disposed between the plates, pivot members extending through the tumblers and the tumbler plates intermediate the ends of the tumblers, lugs on the inner ends of the tumblers, a spring interposed between said lugs, and cam members formed on the outer ends of the tumblers.

WALTER R. SCHLAGE.