Feb. 9, 1937. T. K. TARRIE 2,070,342

LOCK TOOL

Filed March 14, 1936

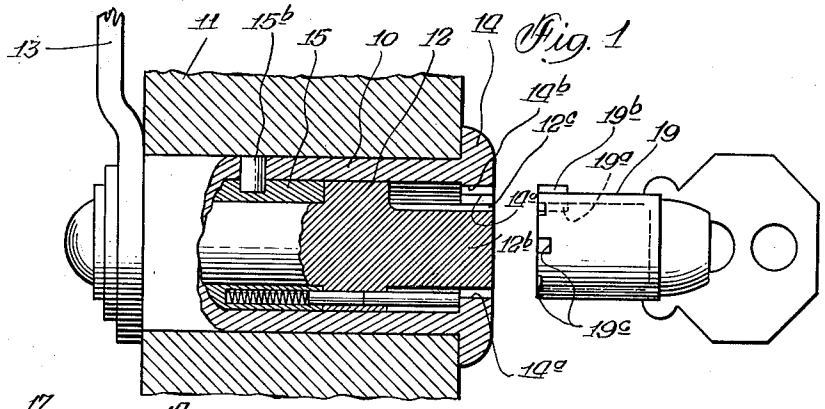


Fig. 1

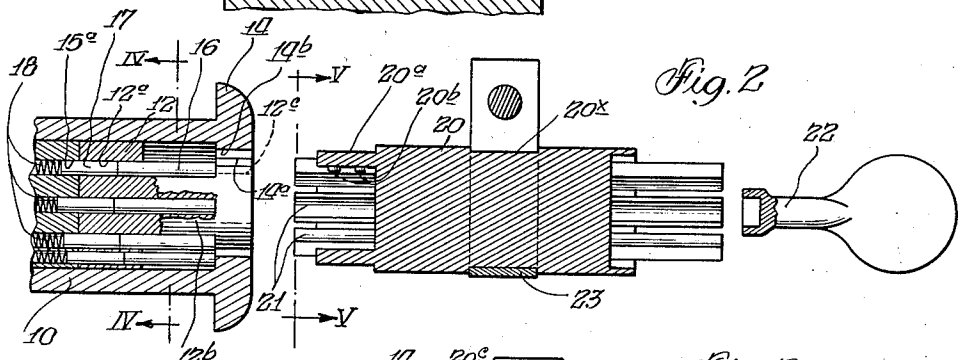


Fig. 2

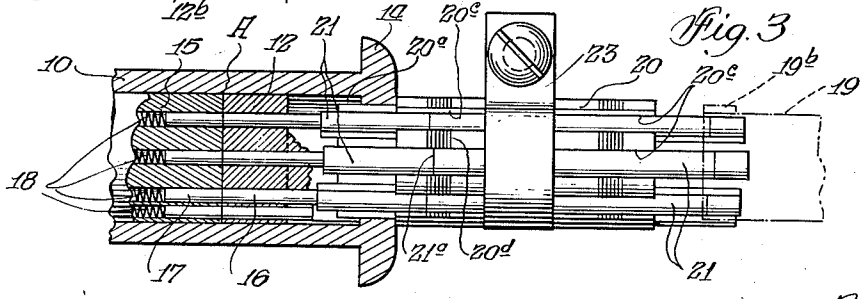


Fig. 3

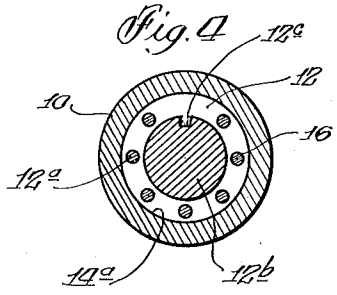


Fig. 4

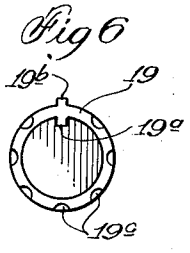


Fig 6

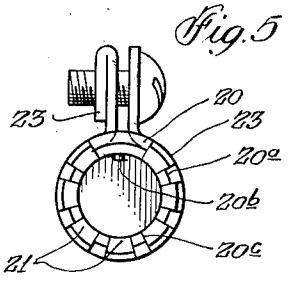


Fig. 5

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LOCK TOOL

Thomas K. Tarrie, Chicago, Ill.

Application March 14, 1936, Serial No. 68,946

5 Claims. (Cl. 70—9)

My invention relates to cylinder locks of the modern type, and more particularly to such locks as are permanently fitted and hardened to withstand tampering by unauthorized persons. Locks of this type are controlled by key profiles classified under a code, so that it is ordinarily impossible for one not having the proper key or the lock number to open the lock. This is, of course, a valuable safeguard, especially when the construction and application of the lock are considered, since to break the lock would mean to tear away the surrounding portion of the article in which it is installed. Consequently, owing to the difficulty in tampering with the type of lock referred to, it has the highest safety rating.

However, the very factor of safety may be detrimental to the owner of the lock in case he has not retained the lock number and happens to lose the key. In such a case, his appeal for assistance to the service department of the lock company or to a locksmith would be of no avail, since no means have so far been devised to decode a lock of this type or make the proper key therefor.

In view of the above difficulty, it is the object of the present invention to provide a means readily applicable to a lock of the type mentioned whereby to determine its code characteristics and so make it an easy matter to order the key.

It is also an object of my invention to design a tool whereby an inverse pattern or templet is procured, making it possible for a handy locksmith to cut the proper key from a suitable blank.

A further object of the invention is to construct the novel lock tool as a simple and compact article which is small in size and simple to operate.

Another object of the invention is to design the novel lock tool with markings calculated to disclose the code characteristics of the particular lock.

With the above objects in view and any others which may suggest themselves from the description to follow, a better understanding of the invention may be had by reference to the accompanying drawing in which:—

Fig. 1 is a section of the lock with the proper key shown in elevation and apart from the same;

Fig. 2 is a section of the lock and of the tool in positions preparatory to decoding the lock;

Fig. 3 is a similar view, showing the tool applied to the lock and with the latter in the decoded or open position;

Figures 4 and 5 are sections on the lines 4—4 and 5—5 of Figure 2; and

Fig. 6 is an end view from the left of the key shown in the right-hand portion of Figure 1.

Referring specifically to the drawing, 10 denotes the cylindrical case of the lock referred to, the same being fitted in the stock 11 of a door, bureau drawer or other article desired to be locked. As is customary in the design of cylinder locks, the lock case 10 is stationary, while the cylinder 12 on the inside of the same is rotatable by means of the key to swing an arm 13 into and out of locking positions relative to the article containing the lock.

The lock case 10 is enlarged at the front with a flanged face plate 14 and contains a second cylinder 15 in its rear portion which is held stationary by a pin 15b directed from the barrel 10. In some instances the rear cylinder 15 is intended to assume a partial amount of rotation, in which event the cavity of the tube in which the pin 15b extends is elongated transversely to correspond. However, for the purpose of the present invention, it may be considered that the rear cylinder 15 is stationary.

The cylinder 12 and the rear cylinder 15 are longitudinally bored with a series of circularly spaced cavities 12a and 15a, these being alined to receive pin tumblers 16, pin-pushers 17 and backing springs 18 in rearward succession. Thus, these parts appear in staggered longitudinal relation in the left-hand portion of Fig. 2 to denote that the cylinder is locked, and in harmony with a parting line A as seen in Fig. 3 when the cylinder is unlocked, this being characteristic of cylinder locks.

In the particular type of lock shown, the cylinder 12 is extended forwardly with a circular stem 12b which fills the greater portion of a circular opening 14a in the face plate 14. The space about the cylinder stem 12b is sufficient for the insertion of a tubular key 19; and the top of the stem 12b is longitudinally grooved at 12c for the passage of an inner key lug 19a when the key is inserted, for purposes of alinement. Also, the face plate 14 is grooved in the top of its opening at 14b for the entrance of an outer lug or lip 19b carried by the key, the purpose of such lug being to retain the key in the lock when it has been turned away from the opening 14b.

In order that a key may fit a lock with a given code characteristic, a series of recesses 19c are cut in the forward end of the key to corresponding depths, these either being cut through the wall of the key or simply gouged from the side thereof, as indicated in Fig. 6. The gouging is of course of a curvature suitable to clear the circular pin

tumblers 16, the bases of the recesses engaging the front ends of the same. It is therefore clear that when the key of Fig. 1 is inserted in the lock illustrated in Fig. 2, the pin pushers 17 will be pushed back against the tension of their springs 18 to procure the parting line A and permit the cylinder to be rotated by the key.

In the event that the proper key has been lost and the code number of the particular lock is not available, the novel tool may be readily employed to decode the lock. As shown in Figures 2, 3, and 5, the tool is essentially composed of a solid cylinder or body 20, one end of which is slightly reduced at 20*a* to the size and thickness of the key blank wall 19. Also, at one point the part 20*a* is extended inwardly with one or more studs 20*b* which serve the same purpose as the inner lug 19*a* of the key. So far, the tool is in the nature of the standard blank for the lock. However, for the purpose of decoding the latter, the tool body 20 is formed with a series of circularly-arranged longitudinal grooves 20*c* in which are slidable a series of strips 21. These are preferably of keystone cross-section to harmonize radially and agree in number and positions with the seven pin tumblers 16 customarily employed in this type of lock. As seen in Fig. 3, the slide strips 21 are of sufficient length to project from the rear end of the tool body 20 to a considerable extent, so that a simple socket implement 22 may be applied to the rear end of any strip to push the latter forward.

In order to gage the code characteristics of the lock, it is first necessary to insert the forward portion of the tool into the same as indicated in Fig. 3. The slide strips 21 are then pushed forward one at a time to back the corresponding pin pushers 17 until the parting line A is attained. This operation is in a fashion a delicate one and requires some knack on the part of the locksmith or other expert handling the tool. Thus, it must first be assumed that the pin tumblers and pushers are not snugly slidable in their bores but have a very slight amount of play therein. Also, the strips 21 are easily slidable in the tool body 20. Thus, when the first strip is advanced, the moment the parting line of the affected pusher is attained the "feel" of the lock cylinder will manifest the slight amount of play referred to before, so that the slightest rotary movement of the cylinder will lock the pusher in the receded position, whereby to allow the advanced strip 21 to remain in place. This operation is repeated with the following strips in the series until all the strips 21 have been advanced in harmony with the parting line A of the lock. The strips are now locked in the advanced positions by a band clamp 23 applied to a reduced portion 20*x* of the tool body 20 and the assembly rotated to prove the opening of the lock.

The tool as now constituted bears the code profile of the key suitable for the lock, and such profile is readable from a series of markings on the tool. Thus, the tool body 20 is formed with a series of circular lines 20*d* spaced longitudinally in code terms, while the strips 21 each have a single line 21*a* which is normally alined with the first line in the series 20*d*. Consequently, positions of departure by the lines 21 are read in terms of the spacings in the series 20*d*, the group of readings comprising the code characteristics of the particular lock.

The markings of the tool are repeated on the opposite side of the clamp 23 for better access in case a key is to be made in accordance with the setting of the tool. While the code characteristics may be taken from the markings, it is also convenient to check the key by the various rear-end positions of the strips 21, as seen in Fig. 3, these constituting an inverse profile for the key and serving as a templet for the application of the latter as indicated by dotted lines.

It will be seen that I have provided a solution for a problem which confronts those who, despite their precaution to install a lock having the highest safety factor, are faced with the loss of the lock number and key. With a tool of the present type in the hands of an approved or registered service man or locksmith, the decoding of the lock is a task of short duration, and a key for the same may either be ordered from the factory or service station if the owner wishes to wait or may be made from a standard blank by the service man or locksmith. Further, it is apparent that the novel tool is an article of small size and extreme compactness, and requires no vise, attaching equipment or extra instrumentalities for its application or use. While the tool is an instrument of comparative precision, it is by no means so delicate as to require extreme care in handling. Finally, it will be apparent that the tool is composed of few parts and may be manufactured at reasonable cost.

I claim:—

1. A decoding tool for a lock having a rotatable cylinder and a circularly-spaced set of tumblers in the latter comprising, a holder, a set of slide strips carried thereby and arranged similarly to the tumblers, the slide strips being capable of individual advance beyond the holder to contact and back each tumbler the necessary distance to attain the parting line, the holder being rotatable when all the tumblers have attained the parting line to turn the cylinder in the unlocking direction, and means to determine the extent to which the slide strips have been advanced.

2. The structure of claim 1, the holder being a cylindrical body with longitudinal grooves and a medial circular recess in its surface, the slide strips being fitted and in the grooves at a depth beneath the surface of the body, and a band clamp seated in said recess and engageable with the portions of the slide strips intersecting the same to secure the slide strips at any position in their longitudinal adjustment.

3. The structure of claim 1, and rear extensions of the slide strips beyond the holder, the ends of such extensions serving as an inverse profile of the frontal tumbler positions and as a templet for the making of a key.

4. The structure of claim 1, and rear extensions of the slide strips beyond the holder, the ends of such extensions serving as an inverse profile of the frontal tumbler positions and as a templet for the making of a key, and the end of the holder adjacent to said extensions being sunken with a circular recess to receive the forward end of a tubular key-blank.

5. The structure of claim 1, the holder having a series of longitudinal grooves in its surface seating the slide strips, and the latter being cross-sectionally in dovetailed relation with the grooves.

THOMAS K. TARRIE.