HOW THINGS WORK

Course Project

ME 371:

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INTRODUCTION

Locks have been safeguarding our properties for past many years. There are several types of locks like combination locks, lever locks, door locks, interlocks etc.. This web page has been created to describe the working of a seven lever lock.

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INSIDE THE CASING

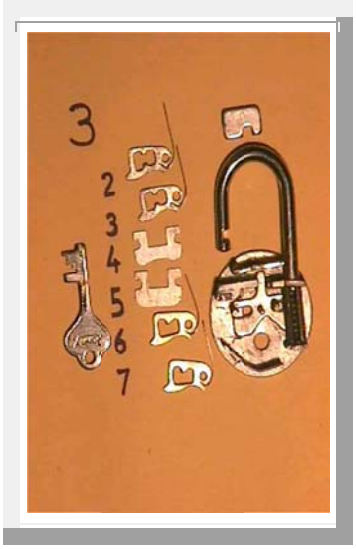
Every lock is provided with an external casing which provides it an elegant look. After removing the external casing, one can observe the internal casing which press-confines the internal parts. After removing the internal casing too, one can observe the internal structure of the lock as shown in fig.

MAIN PARTS OF A LEVER LOCK

* A u-shaped spring loaded hook with a half cut slot at one end.
* A locking or stoping plate which engages with the slot in the hook to "lock" the lock.
* SEVEN LEVERS:-

- Main lever (lever 1) provided with a projecting pin (stop) and slots at both the sides.
- Lever 2 (spring loaded, notched)
- Lever 3 (spring loaded, notched)
- Lever 4 (non spring loaded, unnotched)
- Lever 5 (non spring loaded, unnotched)
- Lever 6 (spring loaded, notched)
- Lever 7 (spring loaded, notched)

* Key which is provided with seven cuts & projections.



NOTE:-

- Generally levers (lever 2 to 7) have a slot inside them.
- Spring loaded levers are notched on the inside of the slot.
- Non spring loaded levers do not have any notch.
- The undersides of each lever may be uniquely shaped and ordering of levers in different locks is different to make them unique.
- Key is provided with cuts and projections corresponding to the variously shaped undersides of different levers.
- The motion of the engaging plate is controlled by the main lever.

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MECHANISM OF THE LEVER LOCK

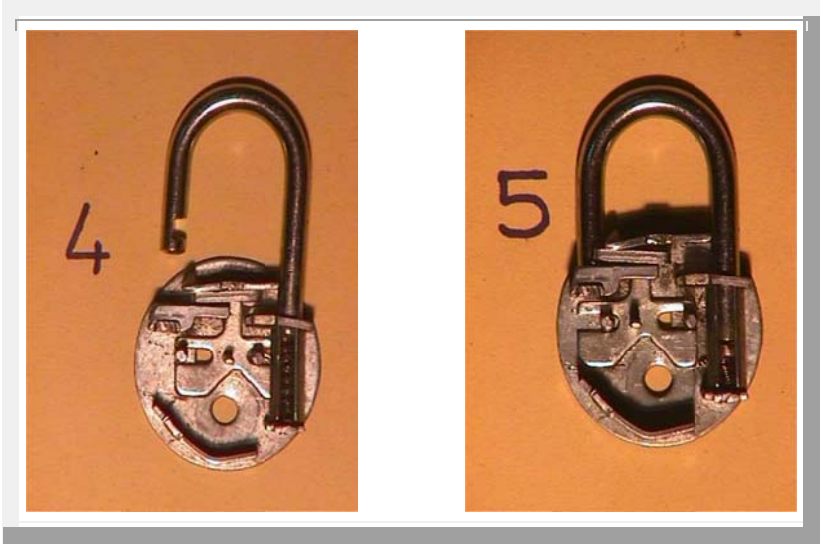

FIG.4 & FIG.5 SHOW THE OPEN and LOCKED configurations respectively of the lock with only the bolt (main lever/lever 1) in it's position. When the bolt and hence the engaging plate are in their rightmost position, The lock is in the "open" mode. when the key is rotated in anticlockwise direction, It pushes the blot and hence the engaging plate with the help of it's first projecting bit to their left most position. In this position the engaging plate engages with the slot in the hook and this is the "locked" mode.

FIG.6 & FIG.7 SHOW THE OPEN and LOCKED configurations respectively of the lock with all the *SEVEN LEVERS* put in their respective order. as can be observed from the fig.6 the projecting pin of the bolt is engaged with the notches formed on the undersides of the other levers. The lock is in open mode when the pin is on the right side of the notches. When the key is rotated in anticlockwise direction, The projections of the bit raise all the variously shaped levers by an exact specified amount giving a clear passage for the pin through the slot. The bolt and hence the engaging plate are then pushed by the key as explained above to their right most position, Hence "locking" the lock.

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