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O. A. SHANN

1,793,254

LOCK

Filed June 29, 1928

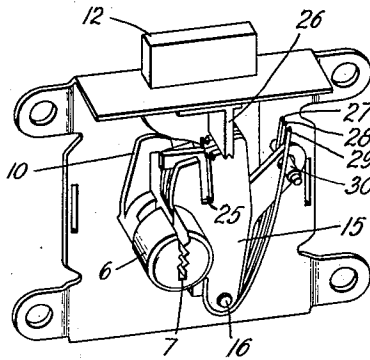


FIG. 1

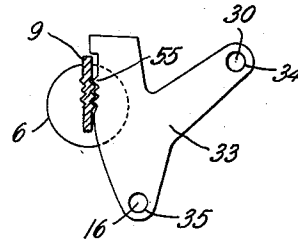


FIG. 3

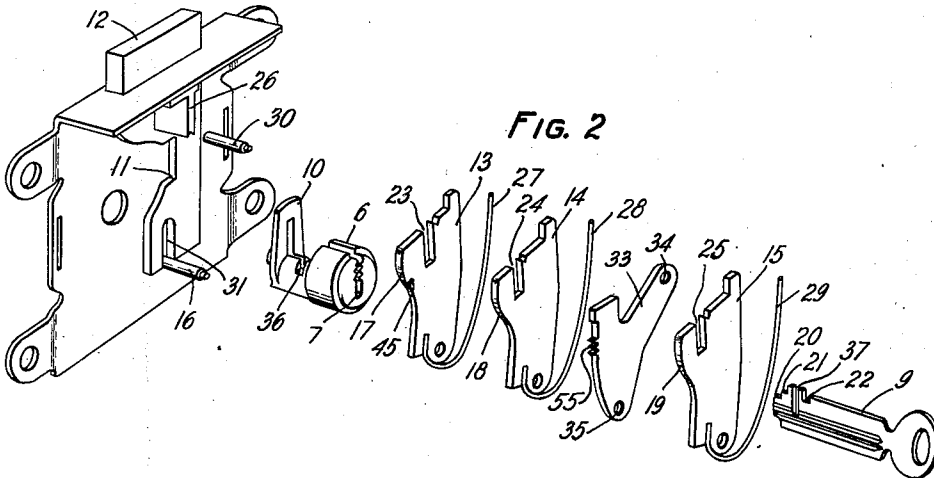


FIG. 2

FIG. 4

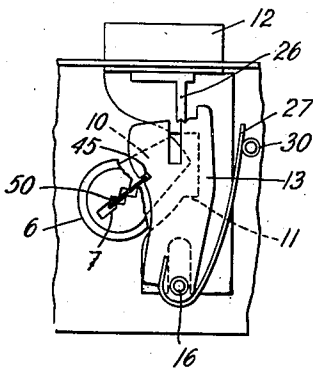


FIG. 5

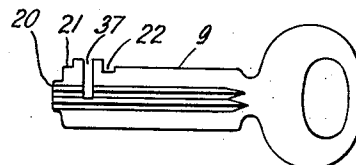
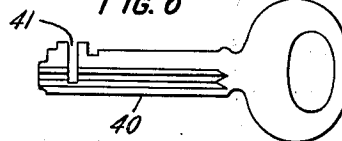


FIG. 6



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LOCK

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This invention relates to improvements in locks.

The object of the invention is to prevent the fraudulent operation of locks of the key operated type.

Tumbler type locks, which have been used in telephone pay stations have a barrel member which is used to withdraw the bolt of the lock. Within the barrel member is a slot into which the operating key having key notches of different depths is inserted. Arranged adjacent the barrel member are pivotally mounted key operative tumblers or levers which have faces of different lengths to correspond to the notches in the operating key. The upper portions of the levers have projections which extend into the path of a lug upon the bolt and prevent the withdrawal of the bolt before the projections are aligned and withdrawn from the path of the lug on the bolt by the rotation of the key in the barrel. With locks of this type the width of the operating keys and the depth of the key notches on the keys have been such that key blanks readily obtainable at the average locksmith could be used to easily duplicate an operating key.

According to one feature of this invention a lock is provided which requires a key having such characteristics that it can not be duplicated through the use of ordinary commercial types of key blanks. One or more stationary partition members are placed among the movable key operative levers and extend well into the area of the barrel of a lock such as has been described above. It may be desirable that such members extend into the barrel to a considerable distance past the center of rotation of the key. To permit turning or rotating the key after it is inserted in the key slot, it is necessary to cut slots in the operating key which are deep enough to enable the key to clear the stationary member or members. With such deep slot or slots cut into the key it is necessary to use a key with its uncut portion adjacent the slots considerably wider than that of the ordinary key otherwise the key would not have the strength necessary for the withdrawal of the bolt. The partitions accord-

ing to this invention have been made of such dimensions that when used in a lock of the type described, the ordinary key blanks such as are readily obtainable at the average locksmith, if used in an attempt to duplicate the proper key would be so weakened as to lack the strength necessary to operate the lock.

According to another feature of this invention the stationary partition members which have been described above are notched to correspond to notches or fluting which are placed in the sides of the key, enabling the partition members to be placed closer to the slot and requiring that a key inserted in the barrel be the proper key before it can slide past the partition members.

According to another feature of the invention the edge of one of the tumblers against which the key rubs is provided with a slot of such width that the normal key readily slides over it but a key constructed of material so thin that as to clear the configuration of the key slot in the barrel drops into it and is held in the slot thus preventing further movement of the key. This feature effectively prevents duplicate keys made from very thin material such as sheet metal, for example, from operating the lock.

Referring now to the drawings, Fig. 1 is a perspective view of the lock according to this invention with the cover removed to show the barrel and the levers or tumblers.

Fig. 2 is an exploded view of that portion of the lock shown by Fig. 1 with the operating key also shown.

Fig. 3 is a view of the stationary partition which is placed among the levers in this lock showing how the face of the partition is notched to correspond with the fluting of the key which is shown in section.

Fig. 4 is a view of a portion of the lock with the barrel partly turned showing how a thin key, shown in section, is caught in a notch in the face of one of the levers.

Fig. 5 is a view of the proper operating key for the lock.

Fig. 6 is a view of a duplicate key made from an ordinary key blank showing the deep slot which is necessary to enable the key to avoid the stationary partition.

Within the barrel 6 is a key slot 7 into which the operating key 9 is adapted to be inserted. The sides of the slot 6 are notched or fluted to correspond with flutings which are placed in the sides of the key. The rear end of the barrel 6 has a lever member 10 which contacts with the face 11 of the bolt 12 to withdraw the bolt upon rotation of the barrel. The levers or tumblers 13, 14 and 15 are pivoted on the post 16 and are all of different widths so that their key operating faces 17, 18 and 19 extend to such distances towards the barrel that they rub against steps 20, 21 and slot 22, respectively, of the key 9 as the barrel 6 is rotated by the key 9, causing, as the barrel is further rotated, the levers to move in a direction away from the barrel until the slots 23, 24 and 25 in the levers 13, 14 and 15, respectively, are under the projection 26 on the bolt 12. At this point the barrel has rotated sufficiently to cause the lever 10 to engage the face 11 on the bolt 12 and upon further rotation of the barrel by the key the bolt 12 in completely withdrawn, the projection 26 passing within the slots 23, 24 and 25 of the levers. The levers 13, 14 and 15 are moved against the pressure of the springs 27, 28 and 29 respectively which are attached to the levers at one end and bear at their other end against the spring post 30. The lower end of the bolt 12 has an opening 31 which fits over post 16 which serves to keep the bolt in alignment on withdrawal.

The stationary partition 33 is shown arranged between the movable levers 14 and 15, is supported by posts 30 and 16 which extend through the openings 34 and 35, respectively, of the partition 33. This partition 33 extends to the very edge of the slot 7 when the barrel 6 is in its normal position and has its edge 55 notched to correspond with the configuration of the slot 7 to enable the partition 33 to have its face 55 as close as possible to key 9 when it is inserted in the slot 7 and also to prevent a key without the correct fluting from passing the partition 33. The barrel 6 has a slot 36 to enable the barrel to avoid the partition 33 when rotated by the key.

The key 9 to avoid the partition has a deep slot 37 cut therein and by having this slot the key is free to rotate the barrel to a distance sufficient to withdraw the bolt 12. Since the partition 33 extends to the very edge of the slot 7, a key to avoid the partition must have a very deep slot and the location of the partition 33 and the size of the barrel 7 have been so chosen that to avoid the partition, so deep a slot has to be cut in a duplicate key that the key blanks readily obtainable for this type of lock would be cut almost through their width in an attempt to make a duplicate key and would lack the strength necessary to withdraw the bolt of the lock. This is illustrated by Fig. 6 where 40 is a duplicate key

for the lock according to this invention illustrated in Figs. 1 and 2 made from an ordinary key blank which is commonly used to duplicate keys for this general type of lock. The slot 41 is cut deep enough to clear the partition 33 and it will be readily seen that there is insufficient metal between the bottom of the slot and the lower edge of the key to enable the key 40 to operate the lock.

Fig. 5 illustrates a key 9 constructed for the lock according to this invention. This key 9 is sufficiently wide to enable the deep slot 37 to be cut therein without impairing the strength of the key.

The lever 13 has a narrow slot 45 cut therein at an angle to its key operative face 17. This slot 45 is made so narrow that the proper operating key 9 slides across the slot without being caught or impeded thereby. However, the slot 45 is made so wide that a duplicate key 50, shown by Fig. 4, made from thin sheet metal, for example, will, in an attempt to withdraw the bolt, be caught within the slot 45 after a small movement of the barrel 6 and further rotation of the barrel will be impossible due to the edge of the thin key being held within the slot 45. Fig. 4 shows the barrel 6 partly rotated to cause the thin key 50 to fall within the slot 45.

What is claimed is:

1. A lock comprising a barrel, a grooved slot in said barrel for the reception of a key, a bolt, key operative levers for controlling the retraction of the bolt, and a stationary partition among said levers extending within said barrel to said slot, said partition having a notched face to correspond to the grooves in said slot.

2. A lock comprising a barrel, a slot in said barrel for receiving a fluted operating key, a portion of said slot being grooved to correspond with the fluting in the sides of the key, a bolt, key operative levers for controlling the retraction of said bolt, and a stationary partition among said levers extending within said barrel to said slot, said partition having a notched face to correspond to the grooves in said slot.

3. A lock comprising a bolt, a barrel, a fluted slot in said barrel for receiving a key of a thickness slightly less than the width of said slot and key operative levers juxtaposed to said barrel and adapted to be engaged by said key for controlling the retraction of said bolt, one of said levers having a notch therein for preventing the turning of said barrel by a key of a thickness less than the clearance between the flutings in said slot.

4. A lock comprising a barrel, a bolt, and key operative levers for controlling the retraction of said bolt, one of said levers having a notch on its key operative face the width of which is less than the thickness of the proper operating key.

5. A lock comprising a barrel, a slot in

said barrel for the reception of a key, a bolt, levers adapted to be engaged by the key and to permit the turning of the barrel sufficiently to allow retraction of the bolt and a partition among said levers extending within said barrel to said slot, one of said levers having a notch on its key operative face to catch an unauthorized key.

6. A lock comprising a barrel, a slot in said barrel for receiving a fluted key, a portion of said slot being grooved to correspond with the flutings in the sides of the key, a bolt, and key operative levers for controlling retraction of said bolt, one of said levers having a notch on its key operative face the width of which is less than the thickness of the proper operating key, and a partition among said levers extending within said barrel to said slot, said partition having a notched face to correspond to the groove in said slot.

In witness whereof, I hereunto subscribe my name this 25th day of June, 1928.

OSCAR A. SHANN.

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