Oct. 25, 1927. 1,646,987

E. M. BENHAM

LOCK

Filed Jan. 21. 1926

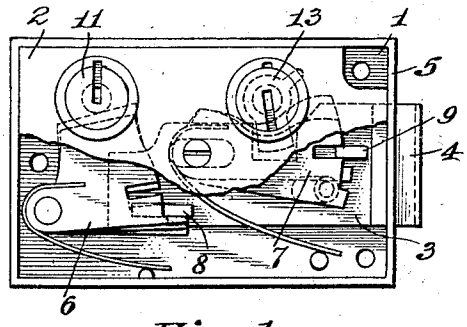



Fig. 1.

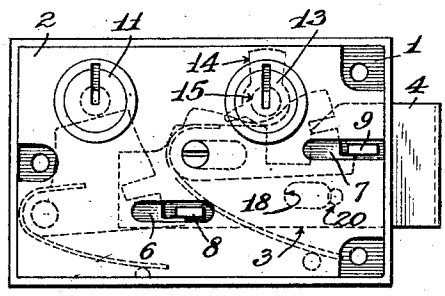



Fig. 2.

Fig. 3.

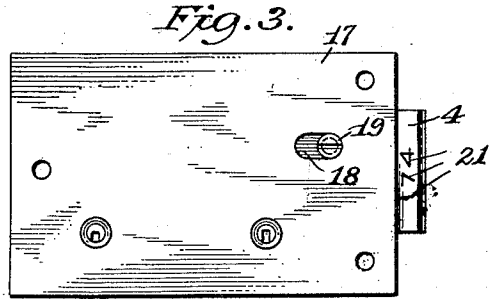



Fig. 4.

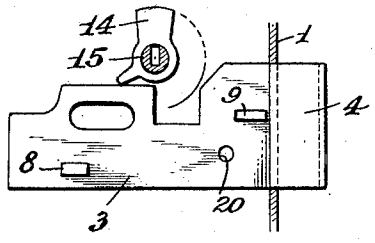



Fig. 5.

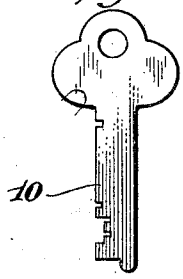



Fig. 6.

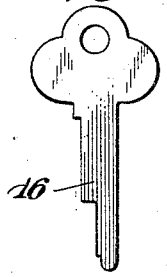



Fig. 7.

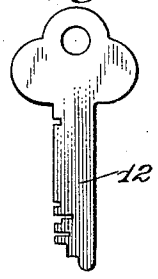
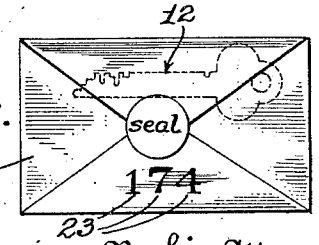



Fig. 8.




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Patented Oct. 25, 1927. 1,646,987

# UNITED STATES PATENT OFFICE.

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## LOCK.

Application filed January 21, 1926. Serial No. 82,689.

This invention relates to locks, and more particularly relates to locks which require the manipulation of two keys to unlock the same, and to locks of the type which are customarily used in connection with safety deposit boxes.

Safety deposit boxes are customarily provided with locks which require two keys for unlocking the box. One of these keys is a guard key, held permanently by the custodian of the bank, and the other key is the customer's key, which is kept by another official of the bank until a customer engages the box, and then this key is given to the customer. It is an advantage to ship the boxes from the factory to the bank in locked condition and to keep the boxes locked pending engagement by a customer. To accomplish this, the boxes are locked at the factory. When it is desired to exhibit a box to a customer, it has been necessary for the custodian to procure from another bank official the particular customer's key for the box. Only in this way has it been possible for the custodian to exhibit the interior of the box to the customer. If the box is engaged, the custodian then turns over the customer's key to the customer. There is a possibility of a dishonest custodian taking an impression of the customer's key while it is thus in his possession, and thereafter, by having a duplicate key made from this impression, to provide himself with means for effecting unlawful entry into the box.

The principal object of my invention is to provide a lock for safety deposit boxes, or the like, which is designed to be operated by both a guard key and a customer's key, but does not require the custodian of the guard key to have possession of the customer's key to lock and unlock the box before the customer's key has been applied thereto, and thus to keep the customer's key out of the hands of such custodian, and to permit this key to be sealed at the factory and not to be unsealed by anyone except the customer who engages the particular box. A further object of this invention is to provide a lock of the character described, which may be locked at the factory and may be maintained locked pending leasing thereof, and may be opened by the custodian for inspection until it has been engaged and the customer's key used thereon, and thereafter being unopenable except by use of the customer's key in connection with the guard key. Another object of my invention is to provide a lock of the character described, which is simple in construction and in operation, and is efficient and durable. A further object of my invention is to provide means on the lock for indicating the particular customer's key suited to the lock. Other objects of my invention will be in part obvious and in part pointed out hereinafter.

In accordance with my invention, the lock comprises a bolt bar, which is dominated by a set of guard tumblers and another set of master tumblers. When the lock is first mounted on the box, it is provided with means which stops locking movement of the bolt before it has moved sufficiently far to allow the master tumblers to move out of alignment. In this condition, the lock may be locked and unlocked by manipulating the guard key and a dummy key, which merely engages the bolt operating cam. This permits the lock to be locked for shipment and to be locked and unlocked pending the leasing of the box to a customer. The customer's key, suited to each box, is preferably sealed at the factory in a separate envelope, and these sealed keys are kept by an official of the bank until the box is leased by a customer. This customer is then given the sealed key suited to the box which he has engaged. Thereupon the custodian releases the bolt of the lock for full movement into locking position, which movement may be accomplished either by means of the custodian's dummy key or by the customer's key. In either case, when the bolt has been moved into full locked position, the master tumblers move out of alignment, thus dogging the bolt and preventing the opening of the lock by the dummy key possessed by the custodian. The customer, however, may unlock the box, so long as the guard tumblers are aligned by the guard key. The lock is arranged in the usual way, preventing the customer from withdrawing his key while the box is unlocked. The underside of the bolt bar may be provided with a designating numeral or mark, which will be exposed when the bolt is projected partially by means of the dummy key, and the envelopes containing the customer's keys may be given corresponding marks or numerals, to indicate which envelope contains the customer's key suited for that particular box. Thus, when

a box is engaged, the custodian projects the bolt partially forward by means of his dummy key, while the door is open, and thus ascertains which sealed key is to be given to the customer.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings, forming a part of this application and illustrating certain possible embodiments of my invention.

Referring to the drawings, Fig. 1 is a top view of the lock partially locked and with the cover plate partially broken away, certain of the parts being shown in dotted lines, to more clearly bring out the construction; Fig. 2 is a top view of the lock completely locked, certain of the parts being indicated in dotted lines to show their location; Fig. 3 is a back view of the lock partially locked; Fig. 4 is a plan view of the bolt bar, a fragment of the front plate, and the bolt operating cam; Fig. 5 is a side view of the guard key; Fig. 6 is a side view of the custodian's dummy key; Fig. 7 is a side view of the customer's key; and Fig. 8 is a diagrammatical representation of the customer's key (in dotted lines) sealed in an envelope. Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring to the drawings, the lock comprises a suitable box or casing 1, having a cover plate 2, and enclosing a bolt bar 3, having a bolt portion 4 which reciprocates through a suitable perforation in the front wall 5 of the casing. Within the casing is a series of pivoted guard tumblers 6 and a series of pivoted master tumblers 7, which coact, respectively, with lugs 8 and 9 of the bolt bar. Guard tumblers 6 are adapted to be actuated by a guard key 10 operating in key tube 11, and master tumblers 7 are adapted to be actuated by a customer's key 12 operating in key tube 13. A bolt bar operating cam 14 is connected with the key post 15 in key tube 13. A dummy key 16 is provided for operation in key tube 13 to actuate cam 14 but not the master tumblers 7.

The rear wall 17 of the lock is provided with a slot 18 therethrough, and a screw 19 threadably engages the bolt bar and has its head positioned in this slot. The slot and screw cooperate to prevent the bolt bar from being moved sufficiently far forward to take the lug 9 out of engagement with the master tumblers 7; in other words, to prevent the master tumblers 7 from moving out of alignment, but permitting the bolt bar 3 to move sufficiently to lock and unlock a box, or the like, on which the lock is mounted. The numeral 20 indicates the threaded hole in the bolt bar 3 for the screw 19.

Preferably, the rear face of the bolt at its forward edge is marked with a designating mark or number, as at 21. The customer's key suited to the box is preferably sealed in an envelope 22 at the factory, and the envelope marked with a corresponding mark or number, as at 23.

At the factory, the lock is mounted on the safety deposit box, and is partially locked by means of dummy key 16, or otherwise, for shipment. The customer's key suited to the box is sealed in the envelope at the factory, and the box and keys are shipped to the bank. When the box has been installed in the bank, the box may be opened for inspection by means of the guard key 10 and dummy key 16, so long as the screw 19 remains in place. When a customer engages the box, he is handed the sealed envelope 22 containing the key for the box. The screw 19 is then removed, thus permitting the lock to be fully locked, either by the dummy key or the customer's key. The consequent movement of the bolt bar will cause the master tumblers 7 to move out of alignment, thus positively preventing the opening of the box thereafter by means of the dummy key. Thus, the customer's key need never be unsealed from the time it leaves the factory until it is placed into the customer's possession, and the custodian or no other bank official or person has access to this key and no opportunity to have the key duplicated for dishonest or other purposes. It will be evident that the custodian will gain nothing by removing the screw 19 before the box is leased.

As many changes could be made in the above construction and as many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:—

1. In a lock of the character described, in combination, a casing, a bolt bar slidable within the casing, and removable means carried on the bolt bar, preventing the bolt bar from traveling its full stroke in locking direction.

2. In a lock of the character described, in combination, a casing, a bolt bar slidable within the casing, and means engaging the bolt bar and casing, preventing the bolt bar from traveling its full stroke in locking direction, said means including a screw penetrating a slot in said casing and engaged with the bolt bar.

3. In a lock of the character described, in combination, a casing, a bolt bar slidable within the casing, and means engaging the bolt bar and casing, preventing the bolt bar

from traveling its full stroke in locking direction, said means including a screw penetrating a slot in said casing and engaged with the bolt bar, said screw being accessible for removal from the rear face of the lock to release the bolt bar for a full stroke in locking direction.

4. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, master tumblers within the casing, a lug on the bolt bar coacting with said tumblers, said bolt bar and lug being movable a slight distance relatively to said tumblers from unlocked position without causing said tumblers to become out of alignment, and removable means for limiting movement of said bolt bar and lug in said casing to movement which will not cause said tumblers to become out of alignment.

5. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, master tumblers within the casing, a lug on the bolt bar coacting with said tumblers, said bolt bar and lug being movable a slight distance relatively to said tumblers from unlocked position without causing said tumblers to become out of alignment, and removable means for limiting movement of said bolt bar and lug in said casing to movement which will not cause said tumblers to become out of alignment, said means engaging said casing and bolt bar and being removable to permit sufficient movement of the bolt bar to release said tumblers.

6. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, master tumblers within the casing, a lug on the bolt bar coacting with said tumblers, said bolt bar and lug being movable a slight distance relatively to said tumblers from unlocked position without causing said tumblers to become out of alignment, and removable means for limiting movement of said bolt bar and lug in said casing to movement which will not cause said tumblers to become out of alignment, the construction permitting such restricted reciprocation of the bolt bar to be effected by means of a dummy key.

7. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, master tumblers within the casing, a lug on the bolt bar coacting with said tumblers, said bolt bar and lug being movable a slight distance relatively to said tumblers from unlocked position without causing said tumblers to become out of alignment, removable means for limiting movement of said bolt bar and lug in said casing to movement which will not cause said tumblers to become out of alignment, a dummy key for effecting such restricted reciprocation of the bolt bar, and guard tumblers in said casing coacting with said bolt bar governing said movement of the bolt in unlocking direction.

8. In a lock of the character described, a casing, a bolt bar slidable within the casing, master tumblers coacting with the bolt bar, guard tumblers coacting with the bolt bar, said guard tumblers being released before said master tumblers are released upon forward movement of the bolt bar, and means for stopping forward movement of the bolt bar after the guard tumblers have been released by such movement and before the master tumblers have been released.

9. In a lock of the character described, a casing, a bolt bar slidable within the casing, master tumblers coacting with the bolt bar, guard tumblers coacting with the bolt bar, said guard tumblers being released before said master tumblers are released upon forward movement of the bolt bar, and means for stopping forward movement of the bolt bar after the guard tumblers have been released by such movement and before the master tumblers have been released, said means being removable to permit further forward movement of the bolt bar and the release of the master tumblers.

10. In a lock of the character described, a casing, a bolt bar slidable within the casing, master tumblers coacting with the bolt bar, guard tumblers coacting with the bolt bar, said guard tumblers being released before said master tumblers are released upon forward movement of the bolt bar, and means for stopping forward movement of the bolt bar after the guard tumblers have been released by such movement and before the master tumblers have been released, said restricted forward movement of the bolt bar being sufficient to place the lock in partial locked condition.

11. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, and an identifying mark on the rear face of the bolt bar adjacent its outer end, said mark being concealed within the casing when the bolt bar is fully retracted and being exposed outside of the casing when the bolt bar is projected.

12. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, tumblers in the casing coacting with the bolt bar and permitting the partial reciprocation of the bolt bar by means of a key which does not coact with said tumblers and removable means for restricting the movement of said bolt bar to said partial reciprocation.

13. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, tumblers in the casing coacting with the bolt bar and permitting the partial reciprocation of the bolt bar by means of a key which does not coact with said tumblers, and removable means for restricting the

movement of said bolt bar to said partial reciprocation, the construction permitting the unlocking of the lock by means of a customer's key after said stop means have been removed and the lock has been completely locked.

14. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, master tumblers having slots, a lug on the bolt bar engaging in the slots and movable to a certain extent therein without releasing the tumblers, stop means coacting with the casing and bolt bar restricting movement of said bolt bar to movement which does not remove said lug from the tumbler slots, the lock being adapted to be partially locked and unlocked by means of a dummy key, and being adapted, when said stop means have been removed, to be completely locked and unlocked by means of a customer's key which coacts with the tumblers.

15. In a lock of the character described, in combination, a casing, a bolt bar slidable in the casing, master tumblers having slots, a lug on the bolt bar engaging in the slots and movable to a certain extent therein without releasing the tumblers, stop means coacting with the casing and bolt bar restricting movement of said bolt bar to movement which does not remove said lug from the tumbler slots, the lock being adapted to be partially locked and unlocked by means of a dummy key, and being adapted, when said stop means have been removed, to be completely locked and unlocked by means of a customer's key which coacts with the tumblers, guard tumblers within the casing, another lug on the bolt bar coacting with said guard tumblers, said lug releasing said guard tumblers during both said partial and complete locking of the lock, said guard tumblers being adapted to be operated by means of a guard key.

This specification signed this 18 day of January, 1926.

EDGAR M. BENHAM.