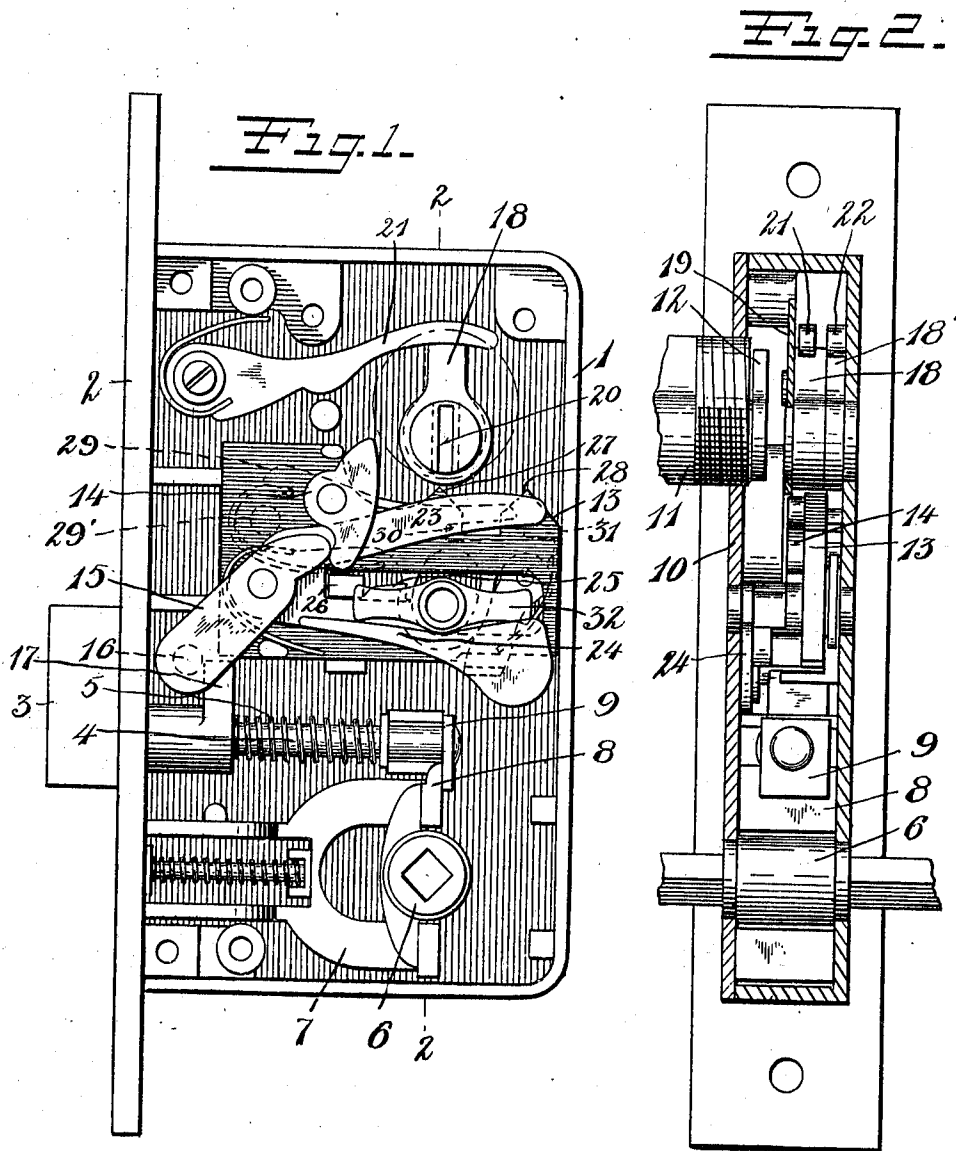


H. G. VOIGHT.
LOCK SYSTEM.
APPLICATION FILED JULY 12, 1910.

974,317.

Patented Nov. 1, 1910.

4 SHEETS—SHEET 1.



Witnesses:
Chas. M. Reed
Frederic M. Hammon

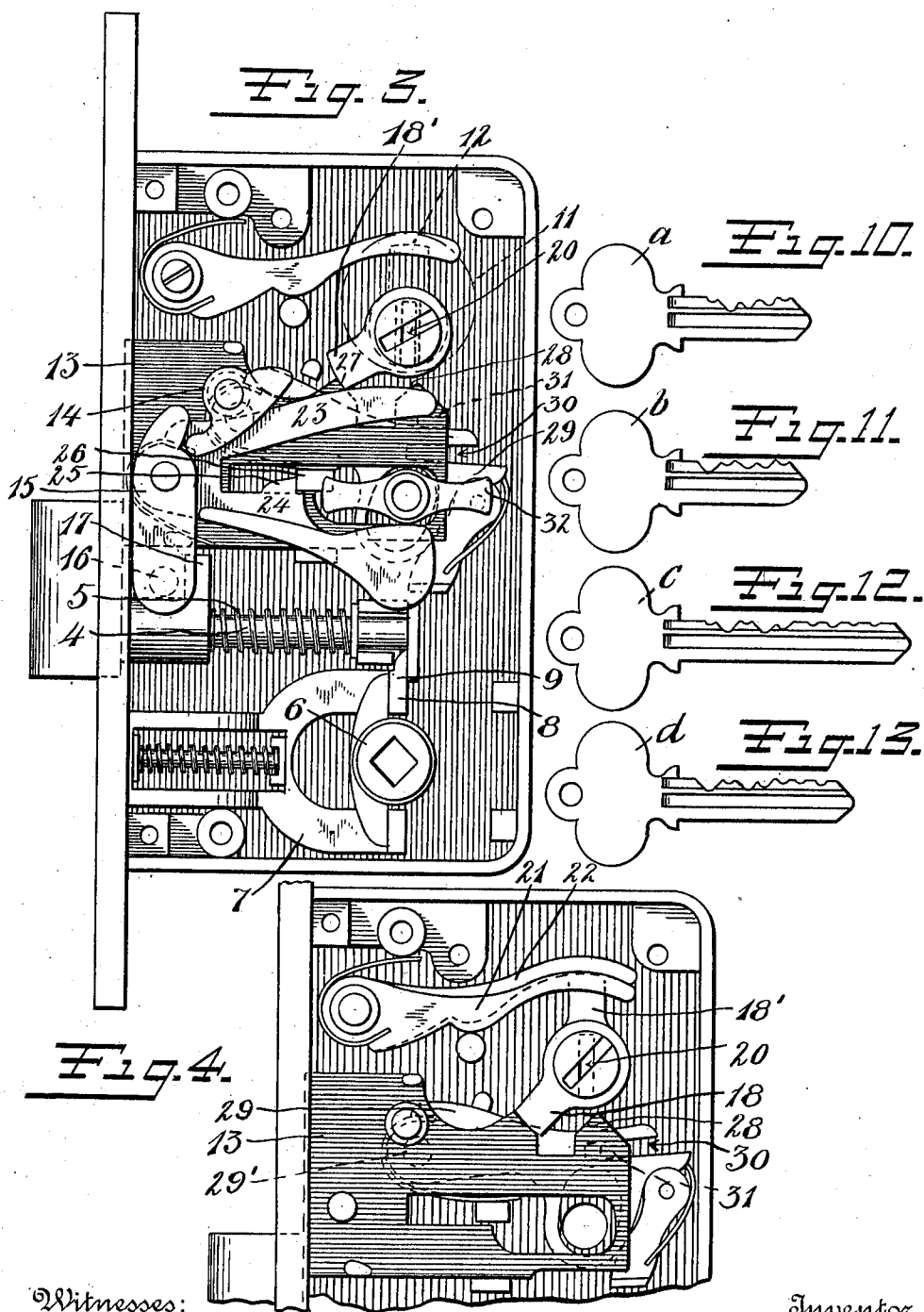
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By his Attorney
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4 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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LOCK SYSTEM.

974,317.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed July 12, 1910. Serial No. 571,552.

To all whom it may concern:

Be it known that I, HENRY G. VOIGHT, a citizen of the United States, residing at New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Lock Systems, of which the following is a full, clear, and exact description.

My invention relates to locks, and is particularly concerned with a system of locks adapted specially for use for example upon a corridor door and a closet door respectively of a room in a hotel or the like. It is to be understood, however, that the system is not confined to such use, but may be employed upon a series of doors of different relative arrangement.

The object of the invention is to provide a system of locks for this purpose in which the corridor door lock is adapted to be operated by a series of keys, including a so-called change key, a master key, a grand-master key and a so-called emergency key, and the closet door lock may be operated by certain only of said keys, such as the change key and emergency key, whereby access to the closet in a hotel apartment, for example, may be confined only to the guest or the proprietor of the house. With these objects in view, the invention comprises a series, in this case two locks, each having tumbler or other mechanism adapted to be operated by similarly bitted or similarly formed keys, and each of said locks having locking bolt operating mechanism, which in the case of the corridor lock may be operated under certain conditions only by certain parts of the guest and emergency keys to the exclusion of the master and grand-master keys, although under certain other conditions said corridor lock bolt mechanism may be operated by all of the keys of the series, while in the case of the closet door lock operation of said lock bolt mechanism is confined exclusively to the guest and emergency keys.

With these objects in view, the invention consists in a lock system comprising a plurality of locks and keys therefor, one embodiment of which is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the so-called corridor door lock, the cap plate being removed to show the interior construc-

tion, including the dead-locking mechanism for the latch bolt. Fig. 2 is a sectional view on the line 2—2 Fig. 1, looking to the left, the cap plate being in place and showing a pin tumbler lock cylinder mounted thereon to cooperate with the latch bolt mechanism. Fig. 3 is a view similar to Fig. 1, showing the dead-locking mechanism of the corridor door lock in the position assumed when thrown into operation by the guest key or by a thumb-turn operable from the inner side of the door. Fig. 4 is a view similar to Fig. 3, showing the dead-locking mechanism in the position assumed when thrown into operation by the emergency key. Fig. 5 is a view similar to Fig. 1, of the so-called closet door lock. Fig. 6 is a sectional view on the line 6—6 Fig. 5, certain parts on the section line being in elevation for clear illustration and showing a pin tumbler lock cylinder in conjunction with the locking bolt. Fig. 7 is a view of the closet door lock looking toward the face plate of the lock when in position on the door and showing the arrangement of the pin tumbler lock cylinder relative to the lock and to the door. Fig. 8 is a view of the inner end of the pin tumbler lock cylinder of the closet door lock. Fig. 9 is a view of the bolt-operating cam member of the closet door lock, detached. Figs. 10, 11, 12 and 13 respectively, are views in side elevation of the master, grand-master, change and emergency keys employed in this system.

In the embodiment of my invention herein shown, I have selected the form of corridor door lock which forms the subject-matter of my copending application Serial No. 568,623, filed June 24th, 1910, in which said lock is fully described in detail. Only such portion of this lock, therefore, as is germane to the present invention will be minutely described in this case.

Referring to Figs. 1 to 4 inclusive, 1 indicates the lock case having a face plate 2 and a latch bolt 3, the latter having a stem 4 surrounded by a spring 5, by which said bolt is normally projected.

6 indicates a roll-back operable by a knob (not shown) only from the inner side of the door.

7 is a roll-back yoke with which said roll-back cooperates, said yoke having a projec-

tion 8 which coöperates with a cross-head 9 on the latch bolt stem 4, by which the latch bolt may be retracted by the knob from the inner side of the door. It is to be understood that the knob upon the outer side is either idle or fixed, and that only the knob on the inside operates the latch bolt.

To retract the latch bolt from the outside, the lock cap 10 has mounted thereon a pin tumbler lock cylinder 11, Fig. 2, having a cam arm 12 on the key plug. Within the lock case is mounted a dead-locking slide 13 having a lever 14 pivoted thereto, which normally lies in the path of the cam arm 12 when the dead-locking slide is in normal position. Also mounted on the dead-locking slide is a lever 15, which coöperates with the lever 14 and has a pin 16 lying opposite a lug 17 on the latch bolt, whereby the latch bolt may be retracted by rotary movement of the cam arm 12. The particular form of lock herein selected for illustration may be operated by any of a series of keys, such as the master, grand-master, guest and emergency keys illustrated in Figs. 10 to 13 inclusive, when the dead-locking slide 13 is in normal inoperative position, as shown in Fig. 1, in which position the intermediate latch bolt operating lever 14 is located within range of the cam arm 12, said keys being similarly bitted to fit the pin tumbler mechanism of the pin tumbler lock 11. While the dead-locking mechanism of this lock forms no part of the present invention, but is particularly described and claimed in my copending application above mentioned, this mechanism will be briefly described, in order to clearly set forth the relation between this lock and the closet door lock forming parts of one and the same system.

Within the lock case and to the rear of the cylinder lock cam arm 12 are mounted the rotary cam arms 18 and 18' suitably journaled in the back of the lock case and in a plate 19, Fig. 2. These cam arms are held in normal position with their key slots 20 in alinement with the key-slot of the cylinder plug by means of spring fingers 21 and 22 respectively. Upon the dead-locking slide is pivoted a V-shaped tumbler having an arm 23, which lies normally in the path of the cam arm 18, the lower arm 24 of said tumbler having a gate 25 coöperating with the racking stump 26 whereby the dead-locking slide 13 may be held in its inactive position, as in Fig. 1, or active position, as shown in Figs. 3 and 4. The dead-locking slide is moved to and from operative position by engagement of the cam arm 17 with the faces 27 and 28 of said slide. The master and grand-master keys illustrated in Figs. 10 and 11 respectively, are of a length only sufficient to extend through

the key plug of the cylinder lock and to operate the cam arm 12 thereof, whereas the guest key and emergency key, as shown in Figs. 12 and 13, are of somewhat greater overall length, and both of said keys are adapted to engage with the key-hole slot 20 of the cam arm 18 at the rear of the cam arm 12. Hence both of said keys may operate the dead-locking slide to and from operative position, whereby intermediate latch bolt operating lever 14 is carried out of range of the cam arm 12, making it impossible to operate the lock by the master and grand-master keys. The change key *d* is of greater length than the emergency key, whereby it may extend through the key-hole slots both in the cam lever 18 and also cam lever 18', and rotate both of said levers simultaneously. The purpose of this construction is to render the lock inoperative by the guest key as well as the master and grand-master keys when the dead-locking mechanism has been moved to operative position by the emergency key. To this end a guard tumbler 29 is pivoted at 29' upon the lock case beneath the dead-locking slide, in the rear end of which is a slot 30, which coöperates with a lug 31 upon the rear of the dead-locking slide. When the dead-locking slide is moved to operative position by the guest key, the cam arms 18 and 18' are simultaneously rotated, the first to release the tumbler gate 25 from the racking stump 26 and to move the dead-locking slide in either direction by coöperation with the surfaces 27 and 28 of said slide, while the second cam arm 18 at the same time depresses the guard tumbler 29 and causes the lug 31 on the dead-locking slide to ride over the upper edge of the guard tumbler (Fig. 3), thus holding said tumbler in depressed position to permit free rotation of the cam arm 18'. When the dead-locking slide is returned to normal position, Fig. 1, the guard tumbler is released from the lug 31 and springs back to normal raised position under the influence of any suitable form of spring. When, however, the dead-locking slide is operated by the emergency key, inasmuch as this key only rotates the cam arm 18 but not the cam arm 18', the guard tumbler remains in its raised position during the forward travel of the dead-locking slide, whereby the lug 31 on said slide is caused to enter the slot 30 of the tumbler and hold the same locked in raised position. Should attempt now be made to return the dead-locking slide to normal position by the guest key, the guard tumbler would block operation of the cam arm 18', which is rotated by this key, hence only the emergency key can release the dead-locking slide from the outer side of the door when said slide is moved to operative position by the emer-

gency key. The dead-locking slide may also be returned to normal inoperative position by a thumb-turn (not shown) on the inner side of the door arranged to operate a roll-back 32, which coöperates with the lower arm 24 of the V-shaped tumbler, said tumbler being provided also with suitable shoulders by which rotation of the roll-back 32 may serve to impart the necessary movement of the dead-locking slide.

Since the particular construction of the lock for this purpose forms no part of the present invention, a detailed description thereof need not be given. From the above description it will be seen that all of the keys may retract the latch bolt through coöperation of the cam arm 12 and the levers 14—14 when the dead-locking slide is in normal position, and that the greater overall length of the change and emergency keys serves to operate the cam levers 18 and 18' respectively whereby the dead-locking slide may be moved to and from operative position and may be blocked against return to inoperative position by the guest key after being actuated by the emergency key.

Referring now to Figs. 5 to 8 inclusive, which illustrate a companion lock of the system, which, for example, may be applied to the closet door of the apartment, to the corridor door of which the lock heretofore described is applied. This lock comprises a case 33 having a face plate 34, a latch bolt 35 operable by a roll-back 36 mounted on a knob spindle 36', which roll-back coöperates with the cross-head 37 on the stem 38 of the latch bolt. The usual roll-back yoke 39 coöperates with the roll-back 36 in the usual manner. This lock is also provided with a dead-bolt 40 having a shank 41 provided with a slot 42 through which a pivot post 43 projects, upon which post is mounted a tumbler 44 having a gate 45 coöperating with a racking stump 46 on the dead-bolt stem. The tumbler is held in engagement with said racking stump by means of a spring 47. Adjacent the rear end of the dead-bolt stem is mounted a rotary cam hub 48 having a cam lug 49 adapted to engage cam faces 50 and 51 upon the dead-bolt stem to move said bolt to and from locking position. The rear end of the tumbler 44 also lies in the path of the cam lug 49, whereby said plunger may be released from the racking stump 46 by said lug 49. The rotary hub 48 is provided with a key-hole slot 52 in alinement with the key-hole slot 53' of a pin tumbler lock 53, said pin tumbler lock being mounted in the door adjacent the lock case 33, as shown in Figs. 6 and 7. The pin tumbler mechanism of the pin tumbler lock 53 is the same in all essential respects as the pin tumbler mechanism of the cylinder lock 11 of the corridor door lock heretofore de-

scribed, so that the keys adapted to fit the one will also fit the other. The locking plug 54 of the pin tumbler lock 53, however, is not provided with a latch bolt operating cam arm of any description, and hence mere rotation of this locking plug 54 performs no useful function. It will be seen, however, from an inspection of Figs. 6 and 7, that while the master and grand-master keys *a* and *b*, as well as the guest and emergency keys *c* and *d* respectively, are bitted to fit the pin tumbler mechanism of this lock 53 and to rotate the key plug 54 thereof, only the guest and emergency keys are provided with portions, or, as in the case illustrated, are of sufficient overall length to engage the cam hub 48 whereby the dead-bolt 40 may be operated.

The pin tumbler lock cylinder 53 is preferably mounted on an escutcheon plate 55 secured to the door, but may be mounted on the lock case 33, if desired.

From the above, while it will be seen that all of the keys are similarly bitted and that both of the locks of the system are provided with tumbler mechanism of similar construction to coöperate with the bitting of said keys, the change and emergency keys alone of the series have portions or are capacitated to operate both locks. The similar bitting of the keys and the employment of similar tumbler mechanism in both locks admits of great economy in the number of keys necessary and in the construction of the several locks wherein on the one hand the dead-locking operation, as above described, may be accomplished, and on the other hand the operation of the closet door lock, for example, may be confined to certain only of said keys.

While I have herein described a particular embodiment of my invention, the same may be altered in detail and relative arrangement of parts without departing from the spirit and scope thereof.

What I claim is:

1. In a lock system, the combination with a plurality of locks, each having a locking bolt, said locks each having a similar key-operable mechanism, of a series of different keys similarly formed to operate said mechanism of each lock, key-operable means in one lock operable by all of the keys of the series to retract its bolt and key-operable means in another of said locks operable by certain of said keys but inoperable by other of said keys to retract its lock bolt.

2. In a lock system, the combination with a plurality of locks, each having a locking bolt, said locks having similar tumbler mechanism, of a series of different keys similarly bitted to fit the tumbler mechanism of each lock, key operable means in one lock operable by all of the keys of the series to

retract its lock bolt, and key operable means in another of said locks operable by certain of said keys but inoperable by other of said keys to retract its lock bolt.

3. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys including a change key and an emergency key, one of said locks having bolt-operating mechanism constructed and arranged to be operated by all of said keys, another of said locks having bolt-operating mechanism, said change and emergency keys only each having portions adapted to cooperate with said second bolt operating mechanism to actuate the bolt of said other lock of the system.

4. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys including a change key and an emergency key, bolt-operating mechanism in one of said locks, key-operable means operable by all of said keys to actuate said bolt-operating mechanism, bolt-operating mechanism in another of said locks, key-operable means for actuating said second bolt-operating mechanism, said change key and emergency key only having extensions to cooperate with said second key-operable means to actuate the bolt in said second lock.

5. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys including a change key and an emergency key, bolt-operating mechanism in one of said locks, key-operable means in said lock for actuating said bolt-operating mechanism operable by all of said keys, bolt-operating mechanism in another of said locks, key-operable means in said second lock for actuating said bolt-operating mechanism, said change key and said emergency key having shanks of greater overall length than the shanks of the other keys of the series, said key-operable means in said second lock being constructed and arranged to receive said shank extensions whereby the bolt of said second lock may be operated exclusively by said change and emergency keys respectively.

6. In a lock system, the combination with a plurality of locks, each having a locking bolt, said locks having similar tumbler mechanism, of a series of different keys similarly bitted to fit the tumbler mechanism of each lock, key-operable means in one lock operable by all of the keys of the series to actuate the lock bolt, key-operable means in another of said locks, said change and emergency keys only each having a portion adapted to cooperate with said second key-operable means whereby operation of the bolt of said second lock is confined to said guest and emergency keys respectively.

7. In a lock system, the combination with

a plurality of locks, each having a locking bolt, said locks having similar tumbler mechanism, of a series of different keys similarly bitted to fit the tumbler mechanism of each lock, key-operable means in one lock operable by all of the keys of the series to operate its lock bolt, key-operable means in another of said locks, said guest and emergency keys only each having extended shanks, said second key-operable means arranged to be engaged only by said shank extensions whereby said second key-operable means may be operated exclusively by said guest and emergency keys to operate said second lock bolt.

8. In a lock system, the combination with a plurality of locks, each having a locking bolt, said locks having similar pin tumbler mechanism, of a series of different keys similarly bitted to fit the pin tumbler mechanism of each lock, key-operable means in one of said locks operable by all of the keys of the series to actuate the lock bolt thereof, and key-operable means in another of said locks, said change and emergency keys only each having portions to cooperate with said second key-operable means to the exclusion of the other keys of a series whereby the lock bolt of said second lock may be operated exclusively by the change and emergency keys respectively.

9. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys, key-operable means in one of said locks normally operable by all of the keys of the series, dead-locking means for said lock bolt, said change and emergency keys only each having a portion to actuate said dead-locking means whereby said lock bolt may be rendered inoperative by the other keys of the series, and key-operable means in another of said locks operable by the dead-locking operating portions only of said guest and emergency keys respectively whereby operation of said second locking bolt may be confined to said guest and emergency keys respectively.

10. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys including a change key and an emergency key, key-operable means in one of said locks normally operable by all of the keys of the series to actuate its lock bolt, dead-locking means in said lock, said guest and emergency keys each having shanks of greater overall length than the shanks of the other keys of the series, said dead-locking means being constructed and arranged to be operated only by said shank extensions of the guest and emergency keys respectively, and key-operable means in another lock of the series constructed and arranged to be operated only

by the shank extensions of said guest and emergency keys respectively whereby the locking bolt of said second lock may be operated exclusively by said guest and emergency keys respectively.

11. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys including a guest key and an emergency key, one of said locks having a key-operable cam arm for actuating said lock bolt normally operable by all of the keys of the series, dead-locking means for the lock bolt of said lock, a key-operable cam arm arranged in alinement with said first cam arm, said second cam arm arranged to actuate said dead-locking means, said guest key and said emergency keys only each having a portion arranged to actuate said second cam arm to operate said dead-locking means to dead-lock the locking bolt against operation by the other keys of the series, and a key-operable cam arm in another of said locks arranged to actuate the locking bolt thereof, said cam arm also arranged to be engaged only by the dead-locking operating portions of said change and emergency keys respectively whereby operation of the locking bolt of said second lock may be confined to said guest and emergency keys respectively.

12. In a lock system, the combination with a plurality of locks, each having a locking bolt, of a series of different keys including a guest key and an emergency key, a key-operable cam arm in one of said locks adapted to be operated normally by all of the keys of the series, dead-locking means in said lock, a key-operable cam arm arranged in alinement with said first cam arm for actuating said dead-locking means, said guest key and emergency key having shanks of greater overall length than the other keys of said series to engage said second cam arm whereby the locking bolt of said first lock may be dead-locked against operation by the other keys of the series, and a key-operable cam arm in another lock of the system arranged to be engaged only by the shank extensions of the change and emergency keys respectively whereby operation of the lock bolt of said second lock may be confined to said guest and emergency keys respectively.

13. In a lock system, the combination with a plurality of locks, each having a locking bolt, each lock having a key-operable plug provided with similar pin tumbler mechanism, of a series of different keys similarly bitted to fit the tumbler mechanism of each lock, the plug of one of said locks having a cam arm whereby said lock bolt may be operated normally by all of the keys of the series, dead-locking means for said lock bolt, a cam arm arranged in alinement with said

first cam arm, said guest and emergency keys only each having a portion adapted to engage said second cam arm to actuate said dead-locking means whereby said lock bolt may be blocked against operation by the other keys of the series, and a key-operable cam arm arranged in alinement with the key-operable plug of another of said locks adapted to actuate the lock bolt of said other lock, said cam arm being constructed and arranged to be engaged only by the dead-locking operating portions of said guest and emergency keys respectively whereby operation of said second locking bolt may be confined to said guest and emergency keys respectively.

14. In a lock system, the combination of a plurality of locks, each having a locking bolt, a key-operable plug for each of said locks, each plug having similar pin tumbler mechanism, of a series of different keys similarly bitted to fit the tumbler mechanism of each locking plug, a cam arm mounted upon the plug of one of said locks to operate the locking bolt thereof and normally operable by all of the keys of the series, dead-locking means in said first lock, a cam arm arranged to the rear of and in alinement with said first cam arm, the shanks of the keys of said series, with the exception of the guest and emergency keys, being of a length only to extend through said locking plug, the shanks of said guest and emergency keys being of a length to extend beyond said locking plug and into engagement with said second cam arm whereby said guest and emergency keys respectively may actuate said dead-locking means to block the lock bolt against operation by the other keys of the series, and a key-operable cam arm in another of said locks arranged in alinement with and to the rear of its locking plug whereby said cam arm may be engaged only by the shank extensions respectively of said change and emergency keys whereby actuation of the locking bolt of said second lock may be confined to said guest and emergency keys respectively.

15. In a lock system, the combination with a plurality of locks, each having a locking bolt, said locks having similar tumbler mechanism, of a series of different keys similarly bitted to fit the tumbler mechanism of each lock, a key-operable cam arm in one of said locks arranged to be operated normally by all of the keys of the series, lock bolt operating mechanism in said lock arranged normally to be operated by said cam arm, dead-locking means in said lock, a key-operable cam arm arranged in alinement with and to the rear of said first cam arm to actuate said dead-locking means, said guest and emergency keys only each having a portion to actuate said second cam arm whereby

said lock bolt may be blocked against operation by the other keys of the series, and a key-operable cam arm in another of said locks arranged out of range of operation by all the keys of said series except the guest and emergency keys respectively and adapted to be engaged by said dead-locking operating portions of said guest and emergency keys respectively whereby operation of the locking bolt of said other lock may be confined to said guest and emergency keys respectively.

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