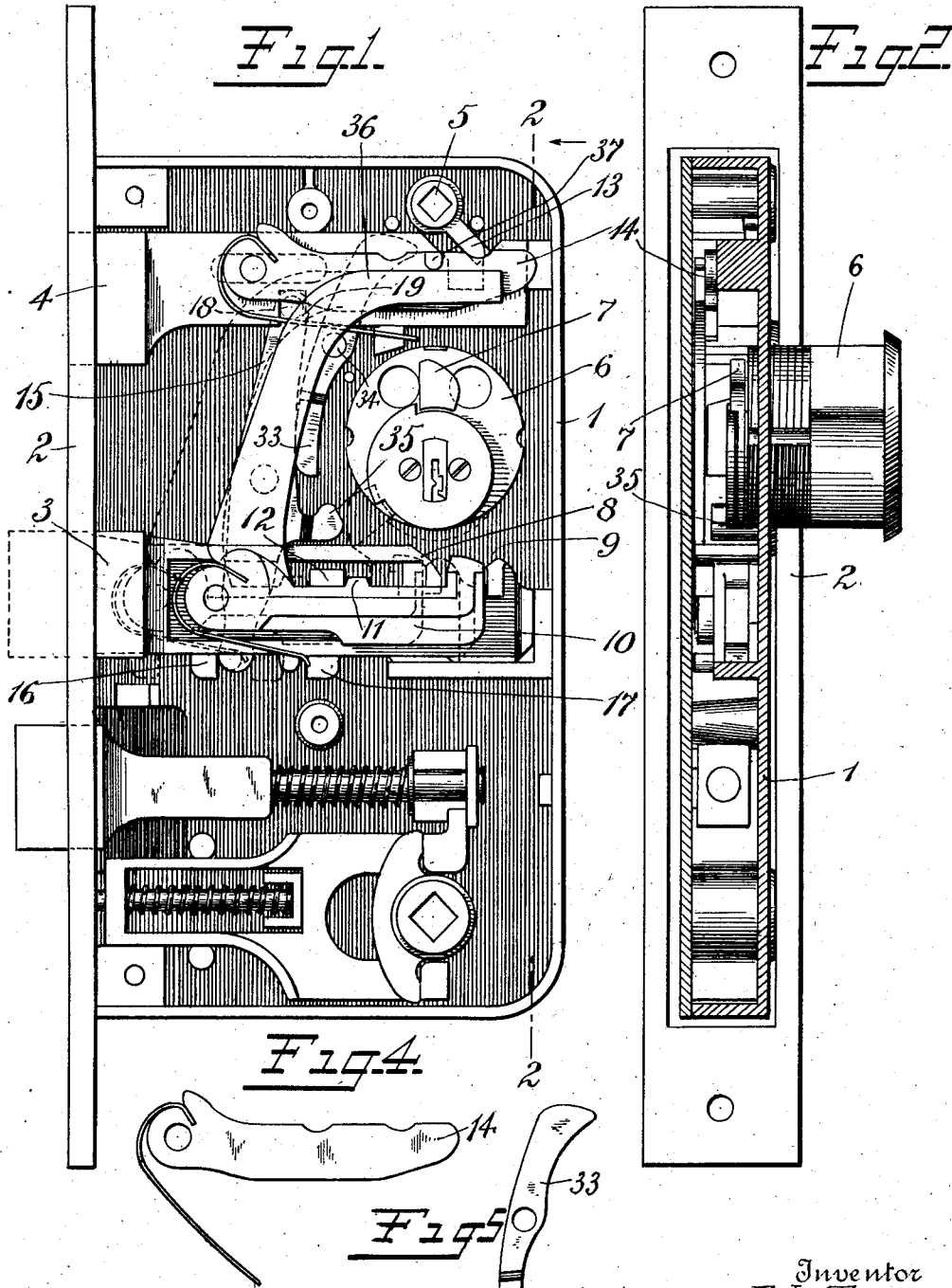


A. ARENS & E. L. TEICH.
HOTEL LOCK CYLINDER CONTROL.
APPLICATION FILED APR. 15, 1911.

1,009,624.

Patented Nov. 21, 1911.

3 SHEETS—SHEET 1.



Witnesses:
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Charles Reed

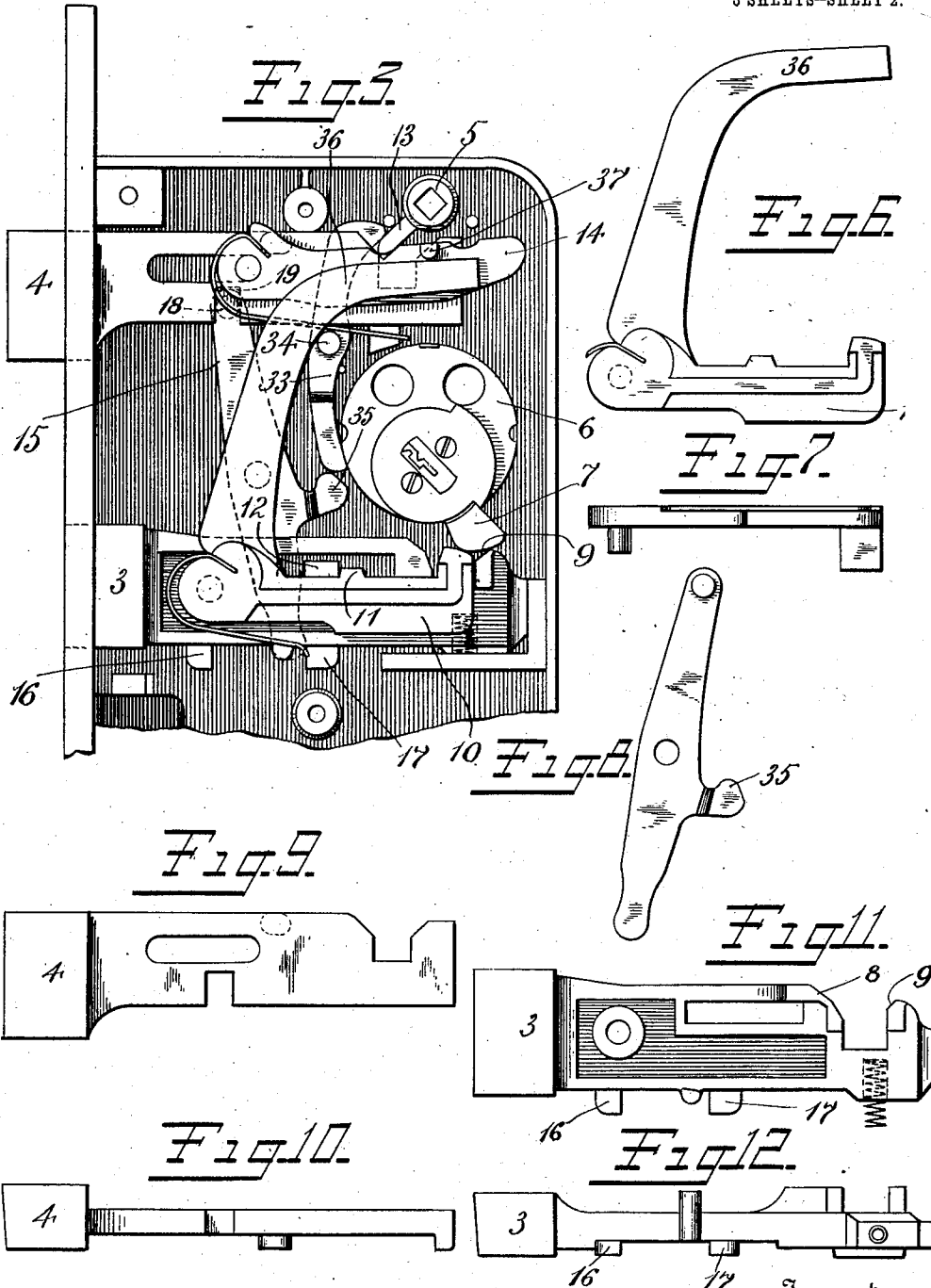
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3 SHEETS—SHEET 2.



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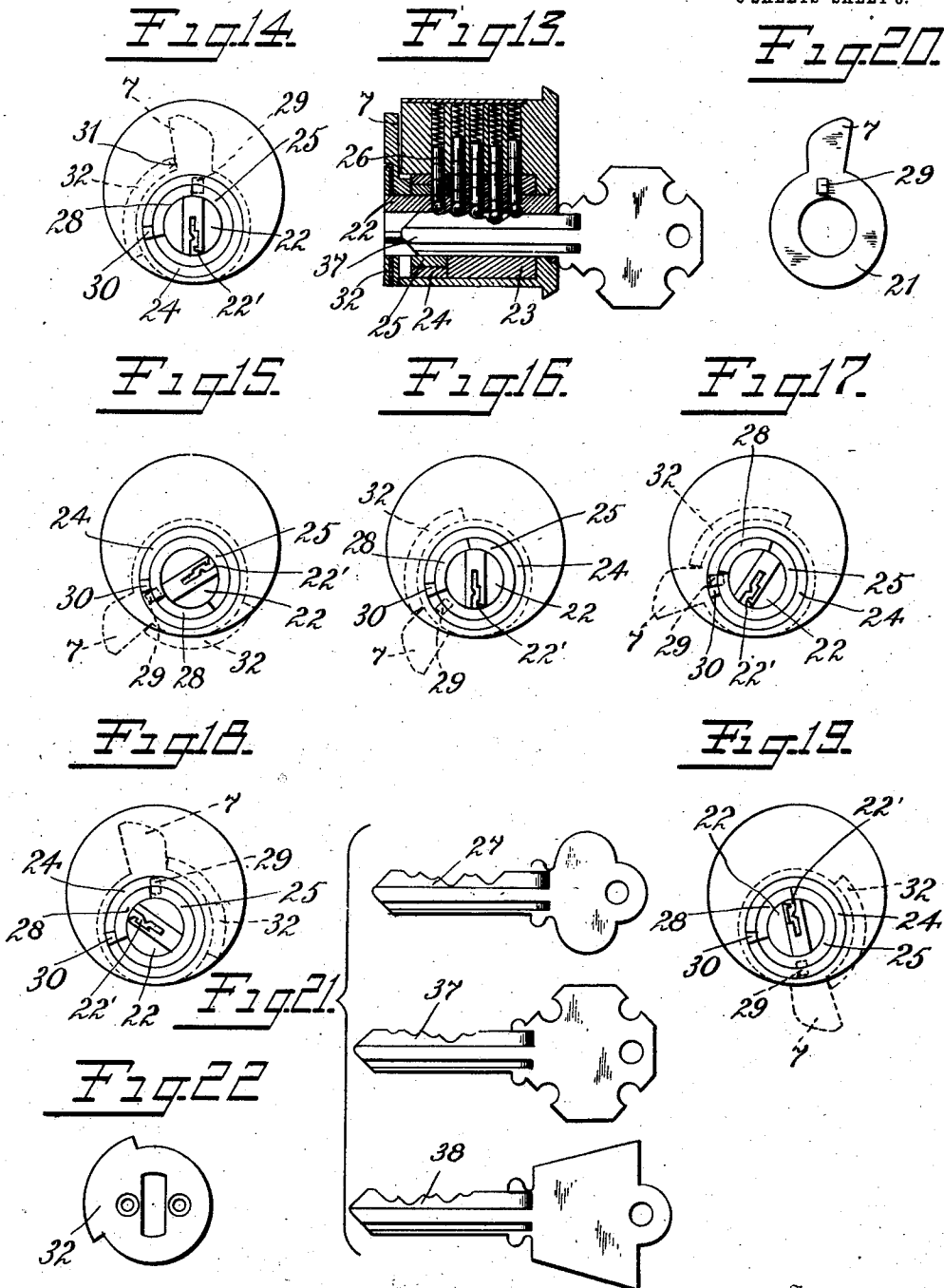
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

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HOTEL-LOCK-CYLINDER CONTROL.

1,009,624.

Specification of Letters Patent.

Patented Nov. 21, 1911.

Application filed April 15, 1911. Serial No. 621,273.

To all whom it may concern:

Be it known that we, AUGUST ARENS and ERNEST L. TEICH, citizens of the United States, residing at New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Hotel-Lock-Cylinder Control, of which the following is a full, clear, and exact description.

Our invention relates to improvements in so-called hotel corridor locks, and the object thereof is to provide an improved construction whereby access to the room may be gained by a guest or change key whether or not the door has been locked from the inner side by the thumb bolt.

A further object is to so construct the lock that it cannot be operated from the outside by either the master or grand-master key for use respectively by a chambermaid or housekeeper when the door is bolted on the inside.

A further object is to provide means whereby the door may be opened by means of an emergency or proprietor's key whether or not it is locked on the inside, and a further object is to provide means whereby the locking mechanism may be so positioned after being locked by the emergency key as to be unlocked by any of the other keys, or so positioned that it cannot be unlocked by any of the other keys, at the will of the proprietor.

With the exception of the object last mentioned, namely, the leaving of the locking mechanism in position so that it can or cannot be operated by the other keys, the objects sought are broadly known in the art. Our improvement, however, contemplates a special construction and arrangement of a so-called cylinder or pin tumbler lock in connection with the bolt mechanism whereby these objects may be attained.

With these objects in view, the invention comprises a lock having a dead bolt operable from the outer side of the door, a thumb bolt operable from the inside of the door, and a pin tumbler cylinder lock provided with a plurality of cylinders and stops operated thereby to varyingly regulate the operation of the several keys of the series to be used with this lock.

With these objects in view, the invention consists in the construction and arrangement of parts, a preferred embodiment of

which is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a lock embodying our invention, the cap plate being removed to expose the interior mechanism. Fig. 2 is a sectional view on the line 2—2 of Fig. 1, looking in the direction of the arrow. Fig. 3 is a fragmentary view of the lock as shown in Fig. 1, but showing the lock bolts in a different position. Fig. 4 is a detail of a tumbler for the inside thumb bolt. Fig. 5 is a detail of a lever connected with the thumb bolt mechanism. Fig. 6 is a detail view of the combined tumbler and connecting lever for the dead bolt and thumb bolt. Fig. 7 is a plan view of the member in Fig. 6. Fig. 8 is a detail of a connecting lever between the dead and thumb bolts. Fig. 9 is a side view of the thumb bolt. Fig. 10 is a view of the under side thereof. Fig. 11 is a side view of the dead or locking bolt. Fig. 12 is an under side view of the same. Fig. 13 is a central sectional view of the pin tumbler locking mechanism to be employed with my improved lock. Figs. 14, 15, 16, 17, 18, and 19 are diagrammatic views of the several positions assumed by the pin tumbler cam arm, and the operating cylinders, together with their stop members, cooperating therewith in performing the various functions of the lock. Fig. 20 is a detail view of the cam member. Fig. 21 comprises side elevations of the change key, master key and emergency key respectively, of the series to be employed with this lock. Fig. 22 is a detail view of a cam actuating disk.

In the embodiment of our invention herein selected for illustration, 1 indicates the lock case having a face plate 2, the dead or locking bolt 3, and a thumb bolt 4, the latter being operated by a thumb turn whose spindle passes through the roll back hub 5 and is operable from the inner side of the door. The locking bolt is operated by a pin tumbler locking mechanism 6 having a cam member 7 operable as hereinafter described, which cam member engages the actuating surfaces 8 and 9 respectively of the locking bolt 3 to project or retract the bolt as the case may be. Upon the locking bolt 3 is pivoted a tumbler 10, having the usual gate 11 cooperating with the racking stud 12 to maintain the locking bolt in retracted or projected position. The thumb bolt 4 is

operated by the roll-back arm 13 on the roll-back hub 5 and said thumb bolt carries the pivoted tumbler 14 which serves to hold the roll-back and the thumb bolt in projected or retracted position respectively.

Before describing in detail the construction of the several operating cylinders of the pin tumbler mechanism and the stop members thereof which serve to determine the operation of the cam arm 7, the operative connections between the locking bolt 3 and the thumb bolt 4 will be described, whereby it is possible to retract the thumb bolt from the outer side of the door when locked from the inner side of the door. Between the locking bolt and thumb bolt is arranged a lever 15, the lower end of which operates between the stop shoulders 16 and 17 on the rear of the locking bolt 3. The upper end of the lever is provided with a stud 18 operating in a slot or recess 19 in the lower edge of the thumb bolt 4. As indicated in Figs. 1 and 3, the thumb bolt may be projected by its thumb turn and roll-back without disturbing the locking bolt when the latter is in unlocked position. The thumb bolt may also be projected when the locking bolt 3 is in projected position, but in this case the projection of the thumb bolt will retract the dead bolt through the lever 15, leaving the door only locked by the thumb bolt from the inner side. It is, however, impossible to project the dead bolt from the outside when the thumb bolt is projected. The thumb bolt must be first retracted, whereupon the dead bolt may be projected or retracted at will. Furthermore, the thumb bolt when projected from the inner side may be retracted from the outside by certain keys of the series, namely, the change key and the emergency key, though not by the master and grand-master keys. By this means the lock may be put in position to confine access to the room to the guest or proprietor. It is also possible to so position the mechanism by the emergency or proprietor's key that the dead locking bolt cannot be retracted by any but the emergency key. For these purposes the lock is provided with a pin tumbler or cylinder lock 6 having at its rear or inner end a bolt operating cam member 7, which, as shown in Figs. 20 and 13, is provided with a bearing ring 21 fitting rotatably or loosely around the key plug 22 of the cylinder lock mechanism. The cylinder lock mechanism is provided with the usual tumbler sleeve 23 for increasing the number of permutations of the lock.

In order to limit the several keys of the series to their respective functions, I modify the pin tumbler cylinder mechanism of the cylinder lock in the manner now to be described. Upon the key plug 22 at the inner end of the sleeve 23 are mounted the con-

centric sleeves 24 and 25. These sleeves are controlled by the pin tumblers 26 at the inner end of the lock.

The biting of the change or guest key 27 and the arrangement of the pin tumblers are such that the guest key will turn both the key plug 22 and the inner sleeve 25. Upon the inner end of this inner sleeve 25 is formed an elongated stop shoulder 28, against which a lug 29 on the inner side of the bearing 21 of the cam member 7 rests when the cam member is in normal position, indicated by dotted line in Fig. 14, and when the key-hole 22' in the key-hole plug 22 is in normal position to receive the key. To project the lock bolt by means of the guest or change key, the cam arm is turned to the right, as viewed in Fig. 14, until the stop lug 29 on the cam member comes in contact with a stop lug 30 on the outer pin tumbler sleeve 24, or the position of the parts indicated in Fig. 15. It should be stated that the cam arm is positively driven by a shoulder 31 on the actuating disk 32, which is secured to the inner end of the key-hole plug 22. This constitutes the normal operation of the locking bolt by the guest or change key. If now it happens that the thumb bolt has been projected from the inner side by the guest's companion, access may still be had to the room by means of the duplicate guest key. To this end, the cam arm 7 is turned in the opposite direction by the guest key to retract the thumb bolt. This is effected through a lever 33 pivoted at 34 in the lock case, one end of which lever stands in the path of the cam member 7 and the opposite end rests against the roll-back arm 13, whereby the actuation of this lever by the cam arm first overcomes the dead-locking effect of the roll-back arm 13 on the tail of the thumb bolt 4, and further movement of the cam member 7 brings it into contact with a lateral projection 35 on the lever 15, whereby said lever is actuated to retract the latch bolt. It is to be noted that this reverse movement of the cam arm 7 is permitted by the fact that the key plug 22 and inner sleeve 25 may be revolved to the left, as shown in Fig. 17, until the stop lug 29 on the cam member is brought into contact with the stop lug 30 on the outer pin cylinder 24. In assuming this position, however, the projection 31 on the actuating disk 32 and the stop projection 28 on the inner pin cylinder 25 have made substantially one complete revolution. This is made possible by the lost motion between the actuating disk 32 and the cam member 7. Hence it will be seen that the duplicate guest key may both project and retract the dead bolt, and may retract the thumb bolt from the outer side of the door. Furthermore, when the door has been locked from the outside by the locking bolt 3, it may be

unlocked from the inside by first projecting the thumb bolt. By this means the tumbler 10 is first released from its racking stud 12 through the arm 36 rigid with said tumbler, the upper end of which arm rests under a projection 37 on the tumbler 14 of the thumb bolt, which tumbler is depressed by the roll-back arm 13 when the thumb bolt is projected, whereby the tumbler 10 is simultaneously depressed and thus releases the locking bolt 3.

It is frequently desirable that when the room is locked from the inner side, access thereto shall be barred both to the chambermaid and the housekeeper. To this end, retraction of the thumb bolt by means of the master and grand-master keys usually in the hands of these parties, is barred in the following manner. The master-key 37, and likewise the grand-master key (not shown) are so bitted and the pin tumblers of the pin tumbler mechanism are so arranged that said master-key is capable of revolving only the key plug 22 of the cylinder lock. Hence, as will be seen from an inspection of the roll-back arrangement of the stop lug 29 on the cam member 7 and the stop shoulder 28 on the inner pin cylinder 25, it is impossible by means of the master-key to rotate the cam member 7 to the left, as viewed in Fig. 3, to actuate the release lever 33 and the retraction lever 15, as heretofore described. These keys, however, may readily project and retract the locking bolt 3. It is furthermore often desirable that access to the room may be gained by the holder of an emergency key, usually the proprietor, under all conditions. To this end, the biting of the emergency key 38 and the arrangement of the pin tumblers are such that the emergency key rotates not only the key plug itself, but both the inner and outer pin cylinders 25 and 24, whereby the emergency key may not only project and retract the locking bolt but may retract the thumb bolt from the outer side of the door through the release lever 33 and the retracting lever 15. Again it is often desirable that access to the room may be confined exclusively to the proprietor, or holder of the emergency key. To this end, the stop shoulders on the cam member 7, the outer and inner pin cylinders 24 and 25, and on the actuating disk 32, are so arranged that when the locking bolt is projected by the emergency key and the rotation of the key is then reversed to a position of the key plug in which it may be withdrawn, these stop members take the position indicated in Fig. 16, in which it is obvious from the mode of operation heretofore described that either the guest, master or grand-master key may retract the locking bolt. If, however, after the emergency key has projected the locking bolt, the

key is continued in its rotation in the same direction until it may be withdrawn, the parts assume the position indicated in Fig. 14, from which it is evident that the latch bolt cannot be retracted either by the guest key or master key, since the guest key can only carry the cam arm 7 around to the left to the stop 30, and the master key cannot move the cam arm 7 to the left at all by reason of the position of the stop 28. Hence it will be seen that the emergency key is capable of placing the pin tumbler mechanism in two positions, in one of which the locking bolt may be retracted by the other keys, and in the other of which the locking bolt may only be retracted by the emergency key.

From the above description it will be seen that the various limitations of function of the several keys respectively of the series are effected through the peculiar arrangement of pin tumbler cylinders and the stops carried thereby of the pin tumbler lock mechanism.

What we claim is:

1. In a hotel lock, the combination with a dead bolt and a thumb bolt having tumbler mechanisms respectively and a connection between said bolts, of a cylinder lock mechanism having a bolt actuating cam arm, and a series of keys including a change key and an emergency key, said cylinder lock mechanism being so constructed and arranged that the door may be unlocked from the outside by the change or emergency keys only, when locked from the inside by the thumb bolt.

2. In a hotel lock, the combination with a dead bolt and a thumb bolt having tumbler mechanisms respectively and having an operative connection between them, of a cylinder lock mechanism having a bolt actuating cam arm adapted to operate upon the dead bolt, a series of keys including a change key and an emergency key, said cylinder lock mechanism being so constructed and arranged that the door may be opened from the outside by the change or emergency keys only, when locked upon the inside by the thumb bolt, and whereby the door may be opened from the outside by the emergency key only, when locked from the outside by the emergency key.

3. In a hotel lock, the combination with a dead bolt and a thumb bolt having tumbler mechanisms respectively and having an operative connection between them, of a cylinder lock mechanism, a series of keys including a change key and an emergency key, said cylinder lock mechanism having means whereby the door may be opened from the outside by any of said keys when locked by any of said keys from the outside including the emergency key when the latter is given a partial rotation only, and means whereby the door may be unlocked from the

outside only by the emergency key when locked from the outside by a complete rotation of the emergency key.

4. In a hotel lock, the combination with a
5 dead bolt and a thumb bolt having tumbler
mechanisms respectively, an operative con-
nection between said bolts, a series of keys
including a change key and an emergency
key, a cylinder lock mechanism having a
10 dead bolt actuating cam arm, and means in-
cluding said cylinder lock mechanism and
the connection between said bolts so ar-
ranged that the thumb bolt may be retracted
from the outside by the change and emer-
15 gency keys only.

5. In a hotel lock, the combination with
a key bolt and a thumb bolt having tumbler
mechanisms respectively and an operative
connection between them, of a cylinder lock
20 mechanism having a key bolt actuating cam
arm, a series of keys including a change
key and an emergency key, said cylinder
lock mechanism comprising a plurality of
pin tumbler cylinders having stops thereon
25 so constructed and arranged that said key
bolt may be retracted by the change key and
the emergency key when projected by partial
rotations only of these keys, and where-
by said key bolt may be retracted only by
30 said emergency key when projected by a
full rotation of said key.

6. In a hotel lock, the combination with
a key bolt and a thumb bolt having tumbler
mechanisms respectively and having an op-
erative connection between them, of a cylin-
35 der lock mechanism having a key bolt ac-
tuating arm, a series of keys including a
change key and an emergency key, and
means including said cylinder lock mecha-
nism and said connections so constructed
40 that the tumbler mechanism of the thumb
bolt may be released and the thumb bolt re-
tracted by the change key or emergency key
only.

7. In a hotel lock, the combination of a
key bolt and a thumb bolt, an operative con-
nection between said bolts whereby the key
bolt may be retracted by projection of the
thumb bolt, a roll-back arm for said thumb
50 bolt adapted to dead lock the same when
projected, of a cylinder lock mechanism hav-
ing a key bolt actuating arm, a series of keys
including a change key and an emergency
key, means for releasing said roll-back from
55 dead locking position by said actuating arm,
said cylinder lock mechanism being so con-
structed and arranged that said roll-back
may be released only by said change key
and said emergency key, and whereby said
60 thumb bolt may be retracted from the out-
side by said change key and emergency key
only.

8. In a hotel lock, the combination with a
key bolt and a thumb bolt, tumblers for said
65 bolts respectively, a roll-back for said thumb

bolt having a roll-back arm adapted to dead
lock said thumb bolt, said thumb bolt tum-
bler being arranged to hold said arm in dead
locking position, a lever to release said roll-
back from dead locking position, a cylinder
70 lock mechanism having a key bolt actuating
arm, a series of keys including a change key
and an emergency key, said cylinder lock
mechanism having a plurality of locking
cylinders provided with stop members re-
75 spectively, said cylinders and stop mecha-
nism being so arranged that said roll-back
may be released by rotation of said key bolt
actuating arm in one direction by said
change and emergency keys only, and where-
80 by said thumb bolt may then be retracted
from the outside by said change or emer-
gency keys.

9. In a hotel lock, the combination with
a key bolt operable directly only from the
85 outer side of the door, a thumb bolt operable
directly only from the inner side of the door,
a roll-back arm for said thumb bolt, a tum-
bler actuated by said roll-back, a tumbler
for said key bolt, a connection between said
90 tumblers whereby said key bolt tumbler may
be operated by said thumb bolt tumbler, an
actuating lever interposed between said bolts
whereby said key bolt may be retracted by
the projection of the thumb bolt, said roll-
95 back arm being adapted to dead lock the
thumb bolt, a lever for releasing said arm
from dead locking position, a cylinder lock
mechanism having a key bolt actuating arm
and having a plurality of pin tumbler cyl-
100 inders, said cylinders being provided with
stops, a series of keys including a change
key and an emergency key, said lever, cyl-
inders and stops being so constructed and
relatively arranged that said roll-back arm
105 may be released only by the change or emer-
gency keys by rotation of said keys in one
direction, and the thumb bolt may be there-
after retracted by continuation of said rota-
tion of the change or emergency keys. 110

10. In a hotel lock, the combination with
a key bolt, of a cylinder lock mechanism
having a bolt actuating arm and having a
plurality of pin tumbler cylinders, certain
of said cylinders being provided with stops,
115 a plurality of keys including a change key
and an emergency key, said cylinders and
stops being so arranged that said bolt may
be retracted by any of said keys when pro-
jected by any of said keys including projec-
120 tion by a partial rotation of the emergency
key, and whereby said bolt may be retracted
by said emergency key when projected by a
complete rotation of said emergency key.

11. In a hotel lock, the combination with
125 a bolt, of a cylinder lock mechanism includ-
ing a bolt actuating arm, a key plug upon
which said arm is rotatably mounted, a pin
tumbler cylinder concentric with said key
plug and having a stop shoulder, a second
130

pin tumbler cylinder concentric with the first and having a stop shoulder, an actuating disk fixed upon said key plug and having oppositely arranged actuating shoulders 5 for said actuating arm, a stop shoulder on said arm coöperating with said cylinder stops, a series of keys including a change key and an emergency key, said pin tumbler mechanism and said stops being so arranged 10 that all of said keys may rotate said actuating disk and thereby the actuating arm by rotation of the key plug in one direction, and being also so arranged that said bolt may be retracted by any of said keys when projected by a partial rotation of any of 15 said keys and retracted only by the emergency key when projected by a full rotation of said emergency key.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
