

A. BLOCK.
LOCK.

APPLICATION FILED JULY 13, 1920.

1,393,006.

Patented Oct. 11, 1921.

2 SHEETS—SHEET 1.

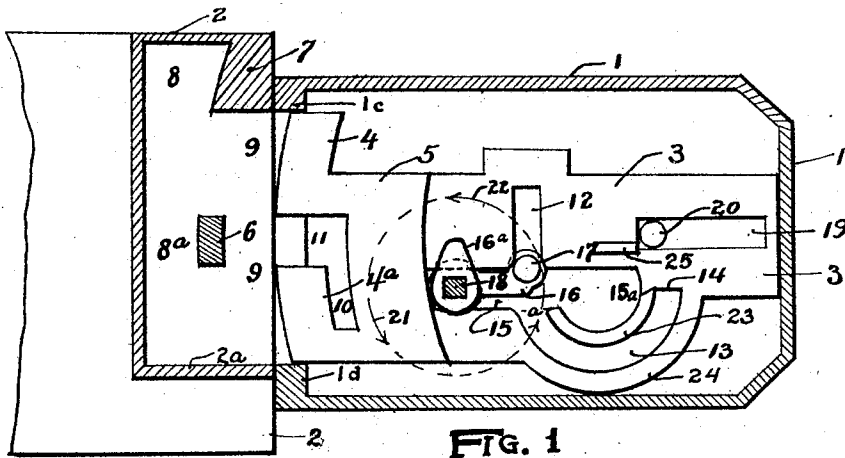


FIG. 1

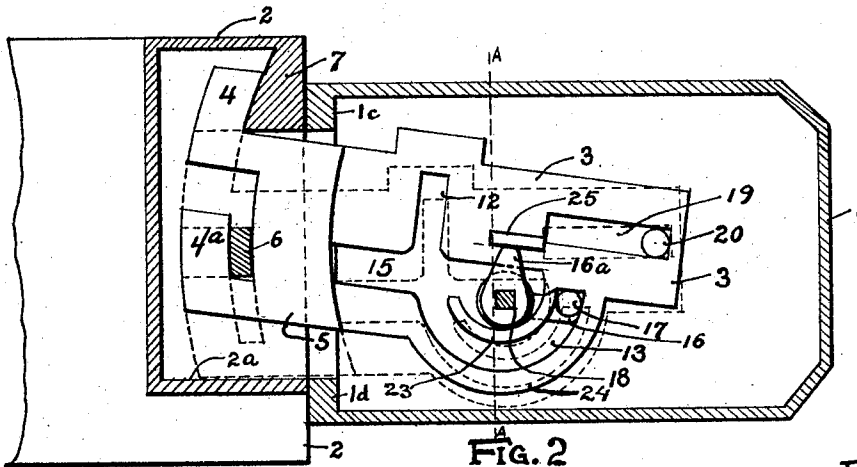


FIG. 2

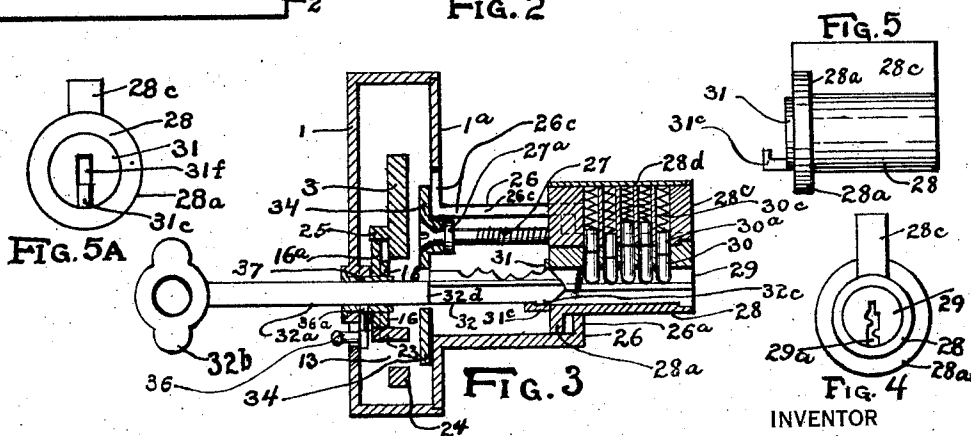


FIG. 3

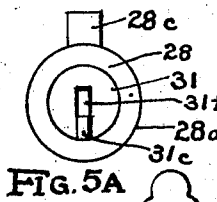


FIG. 5A

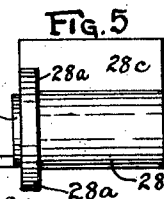


FIG. 5

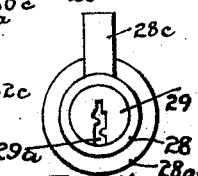


FIG. 4

INVENTOR

Sig. W. Windelman
Vernon F. Rose

Alexander Block

A. BLOCK.
LOCK.

APPLICATION FILED JULY 13, 1920.

1,393,006.

Patented Oct. 11, 1921.

2 SHEETS—SHEET 2.

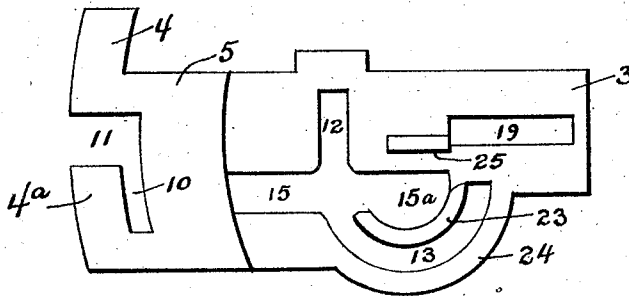


FIG. 6

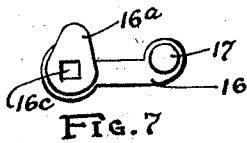


FIG. 7

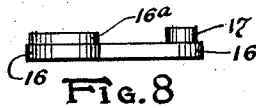


FIG. 8

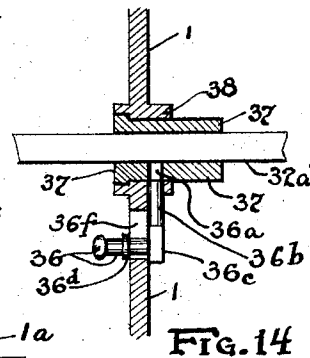


FIG. 14

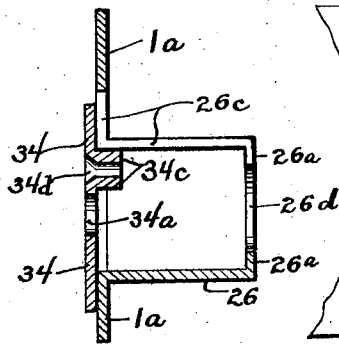


FIG. 9

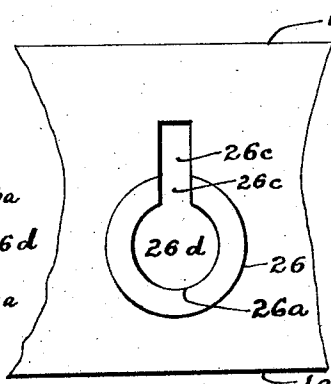


FIG. 10

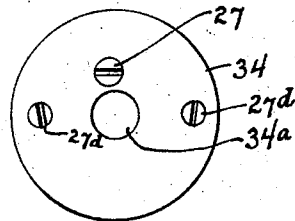


FIG. 11

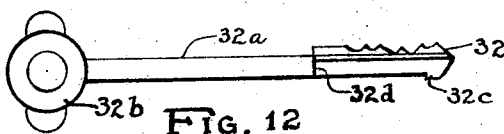


FIG. 12

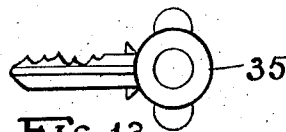


FIG. 13

Bruce D. Higgins
Rosetta G. Higgins

INVENTOR

Alexander Block

UNITED STATES PATENT OFFICE.

ALEXANDER BLOCK, OF NEW YORK, N. Y.

LOCK.

1,393,006.

Specification of Letters Patent.

Patented Oct. 11, 1921.

Application filed July 13, 1920. Serial No. 395,890.

To all whom it may concern:

Be it known that I, ALEXANDER BLOCK, a citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention relates to locks, and more particularly to improvements in locks of the type disclosed in my copending applications, filed April 6, 1920, Serial No. 371,737; and April 15th 1920, Serial No. 374,107.

The main object of said improvements is to reduce the number of working parts to a minimum, and thereby render the lock less likely to get out of order and to cheapen the manufacturing cost thereof. Another advantage in reducing the number of working parts is that such improvement renders it possible to make the lock more compact and thereby saves metal and the consequent increased cost of manufacture.

My application filed April 6, 1920, relates to a lock embracing a bolt having a plurality of hooked bolts on the outer or locking end thereof, a carrier on which said bolt is movably mounted, a carrier actuator, guiding means for guiding the movement of said members, a pawl for restricting movement of the bolt, a pawl for restricting the movement of the carrier actuator, a cam controllable from a knob on the inner aspect of the door for operating the lock, and a separate cam which is key controlled from the outer aspect of the door for operating the locking mechanism.

The object accomplished by the above-mentioned devices in the previous invention is attained in the present invention by only two of said operative mechanisms—the bolt and a single cam for actuating said bolt. Said single cam is rotatable from the outer and inner aspects of the door, and is adapted to move the bolt into locking position and subsequently into engaging position, and to accomplish reverse movement of said bolt from said positions. All of the other devices in the previous invention have been omitted in the present invention, and the lock has been thereby rendered more “fool proof,” more compact and less expensive to manufacture.

The lock embodied in this invention is shown in connection with the type of cylinder or pin lock disclosed in my co-pending

application, filed April 15, 1920, Serial No. 374,107. Several improvements are made in said cylinder or pin lock so as to adapt it for use in connection with the improved locking mechanism of the present invention.

It is understood, however, that the lock embodied in this invention may be operably connected with a different type of cylinder lock; the applicant's type of cylinder lock being shown for the purpose of illustration and not by way of limitation. The applicant's cylinder lock having been fully described and defined in said co-pending application, it is unnecessary to go into minute detail of description of said cylinder lock.

A further object of the present invention is to render a lock of the simple, compact and efficient construction described herein absolutely jimmy-proof:—the said lock comprising a strong, jimmy-proof bolt, a jimmy-proof cylinder lock of the type described herein, and a jimmy-proof keeper of the type disclosed in my co-pending application filed June 21, 1920, Serial No. 390,411.

Other objects and advantages will appear in the specification given herein.

In the accompanying drawing, Figure 1 is a sectional elevation of the lock showing the disposition of the mechanism when in unlocked state. Fig. 2 is a sectional view of the lock showing the disposition of the mechanism when the bolt is in locked and projected position. Fig. 3 is a cross-section of the lock along a line A—A in Fig. 2. Fig. 4 is a front elevation of the cylinder lock. Fig. 5 is a side elevation of said cylinder lock. Fig. 5^A is a rear view thereof. Fig. 6 is a detail view of the bolt. Fig. 7 shows the cam for actuating the bolt. Fig. 8 is an edge view thereof. Fig. 9 is a sectional view of the back plate of the lock casing, showing the cylindrical member attached to said back plate, and the covering plate for the inner opening of said cylindrical member. Fig. 10 is a front elevation of said back plate with parts broken away. Fig. 11 shows an inside elevation of said covering plate. Fig. 12 shows the spindle key for actuating the locking mechanism from the inside of the door. Fig. 13 is the key for actuating said mechanism from the outside of the door. Fig. 14 is a sectional view of the lock showing the mechanism for rendering the locking mechanism inoperative from the inside or outside, parts being broken away and other parts omitted.

The lock body is of the general or any suitable construction, and comprises a lock casing 1, and a keeper 2. The lock casing contains a bolt 3—5 provided with hooked bolts on its outer or locking end, and a cam 16—16^a for actuating said bolt. The keeper 2 comprises compartments for receiving the bolt 5, and separate compartments for the hooked bolts 4—4^a. The movement of the bolt 5 into the keeper is arrested by a stop 6 in said keeper, and when the bolt 5 and its hooked bolts 4—4^a are projected into engaging position, the said stop 6 and another ledge in said keeper arrest the movement of the bolt in the direction of the lock casing except by the instrumentality of the bolt actuating means.

A twin cam 16—16^a is mounted on a rotatable sleeve 37, said cam being adapted to move the bolt longitudinally and subsequently to the locking operation to move the bolt into engaging position. The rotatable twin cam is arranged to be operated by a spindle key 32 from the inside of the door and by a pin key from the outside of the door. Said cam 16 is provided with a stud 17 on its outer or free end, and cam 16^a is disposed substantially vertical to said cam 16. Both of said cams are mounted on said rotatable sleeve 37, through which passes the spindle 32^a of said spindle pin key 32. Turning of said spindle key causes said sleeve 37 to rotate and to cause the cam 16—16^a to actuate the bolt 5.

The bolt 5 is attached to a frame 3; but for purpose of clearness, bolt 5 and its frame 3 will be referred to as the bolt. Into a slot 19 on said bolt, a stud 20 on the casing is adapted to be taken in. Said stud 20 is arranged to act as guide for the bolt during its longitudinal movement, said stud being adapted to act as a fulcrum when said bolt is projected into engaging position subsequently to the locking operation and when the bolt is returned from its engaging to locking position.

Said bolt 3—5 embraces a substantially vertical slot 12 which is arranged to receive stud 17 on cam 16. A slot 13, describing the arc of a circle, is continuous with slot 12, but separated therefrom by a slot 15 running longitudinally on the bolt, said slot 15 terminates preferably in a widened slot 15^a bounded on one side by an arcuate projection 23, which separates slot 15^a from slot 13 and also forms one of the walls of said slot 13. A ledge 25 is positioned on the bolt directly over the widened slot 15^a.

When sleeve 37 is rotated by mechanisms described herein, cam 16—16^a is caused to rotate and to move stud 17 in its progress along vertical slot 12. While said cam 16—16^a is rotated approximately a quarter of a revolution, stud 17 moves along slot 12 and coöperates therewith to move the bolt

longitudinally a distance equivalent approximately to the radius of the circle described in the rotation of cam 16. As cam 16 continues to rotate and to describe the second quarter of a revolution, stud 17 descends in slot 12, and coöperates therewith to move the bolt longitudinally another distance equivalent to the radius of said circle described. It is evident that during the rotation of the cam through half a revolution, stud 17 had forced the bolt to move a distance equivalent to the entire diameter of the circle described by said stud 17. Vertical slot 12 on the bolt in conjunction with improved cam 16 render it possible to move the hooked bolts 4—4^a and the main bolt 5 a considerable distance into the keeper. In completing the revolution cam 16 causes stud 17 to be taken into and to move along arcuate slot 13 without actuating the bolt, until stud 17 reaches stop 14.

Cam 16—16^a is or may be practically two cams mounted on one rotatable sleeve 37. Said cams may be of one piece, and are so disposed as to overlap opposite surfaces of the bolt. Cam 16 in its rotation overlapping one surface of the bolt 3, and actuating said bolt by means of its stud 17 coöperating with slot 12, and cam 16^a being arranged to overlap the opposite surface of said bolt, exercises no function on the bolt until stud 17 reaches stop 14, when the apex of said cam 16^a bears against ledge 25 on the bolt while said stud 17 is bearing against stop 14 to force the bolt and its hooked bolts to be projected into engaging position in keeper 2. To perform the unlocking operation, the cam is caused to rotate in the opposite direction, cam 16^a releases ledge 25, and stud 17 in its progress along arcuate slot 13 bears against its wall 24 and causes the bolt to return to disengaged position, and in its inward and outward progress along slot 12, stud 17 causes the bolt to return into unlocked position in the casing.

Such construction of the bolt in conjunction with said improved double cam renders possible the elimination of the carrier, the carrier actuator, pawls and guides described in my copending application of April 6th, 1920. The upper and lower boundaries 1^c and 1^d of the lock casing opening serve as guides of the outer end of the bolt, and stud 20 is adapted to act as a guide for the inner end of the bolt and subsequently as a pivot upon which the bolt is swung into engaging position subsequently to the locking operation. Slots 15 and 15^a allow of the longitudinal and pivotal movement of the bolt, affording clearance way for the rotatable sleeve 37 during the movement of the bolt into and out of the casing and toward and from engaging position.

The function of pawls is further assumed by stud 17 of cam 16 and the apex of stud

16^a coacting with projections or stops on the bolt. Said bolt is maintained in the casing in the inoperative state by stud 17 being positioned in the entrance to slot 12, so that movement of said bolt is prevented without rotating cam 16. When by the rotation of the cam the bolt is moved into locking position, stud 17 assumes a position directly in the entrance to arcuate slot 13 and thereby prevents reverse movement of said bolt from said locking position. When the bolt is finally projected into engaging position, the apex of cam 16^a abutting on ledge 25 of the bolt, and stud 17 abutting on stop 14 securely maintain the bolt in said projected position. It is evident then that the bolt in a lock of the construction described herein is provided with efficient means acting to prevent reverse movement of said bolt from its operative or inoperative positions, without resorting to separate, spring-pressed devices designated as pawls. In the present invention, the actuating means also act as maintaining means and with greater efficiency than additional spring-pressed devices could have accomplished. This invention therefore eliminates a great number of parts described in said copending application, and thereby renders the lock more efficient, less likely to get out of order, more compact, and lessens the manufacturing cost thereof.

The construction of the bolt and said improved actuating cam efficiently prevent displacement or dislocation of the bolt through the instrumentality of a jimmy or other instrument designed to force open a door. As has been shown, cam 16^a and stud 17 of cam 16 prevent movement of said bolt in a direction away from its projected position. The hooks of hooked bolts 4 and 4^a prevent forcible displacement of the bolt in the direction of the lock casing, said hooks 4 and 4^a respectively engaging with cross-pieces 7 and 6 in the keeper. Cross piece 6 is positioned within the keeper, a distance away from the entrance to said keeper, to allow of the movement of the main bolt 5 a goodly distance within said keeper and thereby provides for better protection of the door. Displacement of the bolt is further rendered difficult by the peculiar conformation of the hooks on the hooked bolts attached to the locking end of the bolt 5. Said hooks occupy preferably segments of a circle having for a center the point upon which the bolt is pivoted into projected position, and the cross-pieces in the keeper with which they are adapted to engage have their inner surfaces preferably concentric with the inner surfaces of the hooks; to the end that when the bolt is swung into engaging position, the hooks engage with said cross-pieces at an acute angle, and further assists in rendering the bolt proof against forcible displacement from said projected position through the in-

strumentality of a jimmy. It is understood that I do not wish to limit myself to such conformation of hooks and cross-pieces. Said hooks may be vertically or otherwise disposed on their bolts, and said cross-pieces may have vertical inner surfaces.

In rotatable sleeve 37 a spindle 32^a is mounted and is adapted for slidable movement therein. Said spindle 32^a is adapted to rotate said sleeve 37 and thereby cause cam 16—16^a to actuate the bolt. To the outer end of the spindle may be attached a head member or knob for turning said spindle, and to the inner end of said spindle is attached a key 32, the free extremity of which key is housed normally in the inner end of key plug 29. Said key 32 and the spindle 32^a are adapted to operate the locking mechanism from the inner side of the door, the spindle projecting a distance beyond the lock casing allowing of the movement of said spindle 32^a and the key 32 attached thereto, respectively into the lock body and the cylinder lock. When the key 32 has been moved a distance sufficient to release the tumbler barrel 29 by actuating pins 30 and 30^a, its further movement outward is arrested by stop 32^d. Now that the tumbler barrel is released, the spindle 32^a may be rotated by means of head member 32^b, and thus rotate sleeve 37 and force the cam 16—16^a to actuate the bolt. When the operation of the locking mechanism has been completed, spindle 32^a is withdrawn from the lock body until its progress is arrested by tooth or projection 28^a at the outer end of key 32 abutting against hooked projection 31^c on plate 31 attached to the inner end of the tumbler barrel 29. When the key is thus withdrawn by means of withdrawing of the spindle subsequently to completing the operation of the locking mechanism, springs 30^c in tumbler barrel casing 28 force pins 30^a to return pins 30 into normal rest position and thereby to lock the tumbler barrel 29 in the tumbler barrel casing 28 and prevent the rotation of said tumbler barrel in its casing. When the tumbler barrel 29 is in the locked state, key 32 and the spindle 32^a to which it is attached cannot be rotated and therefore the locking mechanism cannot be actuated. To operate the locking mechanism from the outside of the door, a key 35 is introduced into the key plug 29, as in any other type of cylinder or pin lock; pins 30 and 30^a are moved into positions to allow of the rotation of said tumbler barrel 29, and as the tumbler barrel is rotated by said outside key 35, said inside key 32 and the spindle attached thereto are forced to rotate and to actuate the locking mechanism, when the operation is completed, key 35 is withdrawn, and the tumbler barrel is again locked against rotation and the bolt and its actuating means are prevented from moving in

a reverse direction to that to which they had been moved by the rotation of key 35.

It is evident then that the inside key 32—32^a possesses the double function of pin key and spindle when the locking mechanism is operated from the inside of the door, and only possesses the function of a spindle when the locking mechanism is operated from the outside of the door by a removable pin key. This contrivance renders it possible to operate the bolt by means of one actuating device 16—16^a both from the inside and outside of the door, instead of by two separate cams mounted on two separate rotatable sleeves as in the previous invention disclosed in the application of April 6th, 1920. It becomes obvious that the function of pawls are practically assumed by the spring-pressed pins 30^a in the cylinder lock, said pins locking the tumbler barrel against rotary movement in the tumbler barrel casing and thus preventing the rotation of the spindle key, all acting to prevent reverse movement of the bolt and its actuating cam except by the instrumentality of the means for releasing said tumbler barrel from its locked state to allow of its rotation and thus of the rotation of said spindle key.

Means are provided for rendering the locking mechanism inoperative. When it is desired to prevent operation of the locking mechanism from the inside or outside of the door, or when the door is locked from the inside by means of spindle key 32—32^a and it is desired to prevent unlocking of the door from the outside even with a key that would normally release tumbler barrel 29, a device for locking rotatable sleeve 37 is provided that effectually prevents unlocking of the door from the outside even by the proper key. Said sleeve locking device comprises preferably a slide member 36^c positioned on the inner side of the lock casing, a pin or push member 36 is attached to said slide member 36^c and runs preferably vertical thereto through a slot 36^f in the lock casing 1 to the outside of the lock body where it may be manipulated for actuating the locking device. Another pin or locking rod 36^b is attached to slide 36^c and is confined in the lock casing, being preferably in alinement with said slide member. The free end of said locking pin 36^b is or may be normally housed in a hole in a flange on the inside of the lock casing, said hole guiding said pin in its movement and preventing displacement of the pin. Guide 36^d also coöperates with slide member 36^c to guide the movement of said locking device along slot 36^f in the lock casing. A hole 36^a in sleeve 37 is normally in alinement with locking pin 36^b and is adapted to receive the free end thereof for locking said sleeve against rotation by spindle key 32—32^a. When it is desired to prevent operation of the lock-

ing mechanism, member 36 is moved in the direction of the sleeve 37 which moves pin 36^b into hole 36^a in rotatable sleeve 37 and thereby prevents rotation of said sleeve and operation of said locking mechanism. Moving said pin 36 away from the sleeve, removes locking pin 36^b from the hole in said sleeve, and allows of the operation of said mechanism.

In my copending application for locks filed April 15, 1920, Serial No. 374,107, a cylinder or pin lock of the type shown herein is disclosed in detail. The cylinder lock shown in conjunction with the present invention, however, presents certain changes in construction that adapts it for use in connection with the improved lock disclosed herein. Back plate 1^a of the lock casing embraces a cylindrical member 26 which is preferably made or cast of one piece of metal. The outer end of said cylinder embraces an inside flange 26^a and an opening 26^d; the inner end opening into the lock body and is preferably arranged to be closed by a covering plate 34 which may be fastened to back plate 1^a by means of screws. Said covering plate embraces an opening 34^a through which the spindle key 32—32^a is adapted to pass and move, and another opening 34^d passing through an offset on said covering plate. In said opening 34^d, a screw 27 is mounted for rotatable movement; said screw being provided with a collar 27^a that prevents individual movement of the screw during rotation. The cylindrical member 26 is further provided with a slot running longitudinally along the entire length of said cylinder, and extending for a distance into the back plate 1^a. The cylinder lock 28 is mainly cylindrical in shape, being provided with an offset 28^e that forms a casing for springs 30^c and pins 30^a which are in alinement with holes in tumbler barrel 29 mounted for rotatable movement in said casing 28. Said holes in the tumbler barrel contain pins 30 which the spring-pressed pins 30^a tend to maintain in normal position for locking the tumbler barrel in its casing against rotation therein. A cover 28^d on offset 28^e confines said springs 30^c in said offset. At the inner end of said casing 28 an outward flange is provided which is adapted for slidable movement in the inner surface of cylindrical member 26, and flange 28^a of said tumbler barrel casing is arranged to abut on inner flange 26^a of cylindrical member 26 for arresting the movement outward of said cylinder lock. A threaded recess is provided in the outward extending flange 28^a of the tumbler barrel casing for receiving screw 27, said screw when rotated being adapted to adjust the cylinder lock for varying thicknesses of doors.

Tumbler barrel 29 is provided with a

flange at its outer end that fits into a grooved collar in the tumbler barrel casing and prevents movement of said tumbler barrel in an inward direction. To the inner end of said tumbler barrel 29 is attached preferably by means of screws, a plate 31 provided with a slot 31^f in alinement with the key groove in the key plug. Said plate 31 also embraces a hooked projection 31^e which coacts with a tooth or projection on spindle key 32 for preventing complete removal of the spindle key from said key plug, but allows the keys to be withdrawn a distance sufficient to allow of the locking of the tumbler barrel 29 by said pins, and also to allow of the introduction of a key from the outside of the door for releasing said tumbler barrel to allow of the rotation of said tumbler barrel, to in turn rotate spindle key 32—32^a, and thus to operate the locking mechanism. Stop 32^a on spindle key 32—32^a prevents the movement of key 32 into tumbler barrel 29 a distance greater than is required for releasing said tumbler barrel.

In assembling the lock, back plate 1^a is removed from the casing, covering plate 34 is removed from said back plate, and the cylinder lock 28 is introduced with the outer end through the inner opening of cylindrical member 26, offset 28^c being passed into slot 26^c in the back plate and said cylinder 26. Spindle key 32 is introduced through slot 31^f of plate 31 into the inner end of key plug slot, so that the free end of said key is normally housed therein, screw 27 is introduced in the recess in flange 28^a provided for that purpose, and covering 34 is screwed or otherwise fastened to back-plate 1^a. By rotating said screw 27 the cylinder lock may be adjusted for the thickness of the door to which it is to be applied, the back plate is then again fastened to the lock body, and the entire locking mechanism is ready to be applied to the door.

A hole is cut in the door of a size sufficiently large to admit the cylindrical member and the cylinder lock, the lock body is fastened to the door, preferably by means of screws, and an escutcheon plate is fastened to the outside of the door to cover up the cylinder lock, leaving exposed only the tumbler barrel or key plug.

The operation of the lock is as follows:

To lock the door from the inside, spindle 32^a is moved into the lock body by means of head member 32^b until its further progress is arrested, the key is then turned in the direction for locking the door, and it is then withdrawn as far as it will go. To unlock the door from the inside, said spindle key is moved into the lock body and the key is turned in the reverse direction. For operating the lock from the outside, a pin key is inserted in the key plug and turned as in any other cylinder or pin lock, with this

difference that the rotatable key plug now operates the spindle key and causes said spindle key to rotate the sleeve and operate the same cam that is operated in actuating the bolt from the inside of the door.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is,—

1. In a lock, the combination of a bolt, means for actuating said bolt, key operated mechanism for operating said actuating means, and a spindle key connecting said mechanism with said actuating means, said key being movable in and out of said mechanism and adapted to operate said mechanism to allow said spindle key to operate the bolt actuating means.

2. In a lock, the combination of a bolt, means for actuating said bolt, key-operated mechanism for operating said actuating means, including a spindle key connecting said mechanism with said actuating means, and passing through the lock body and projecting a distance beyond one side of said lock body, said key being movable in and out of said mechanism and arranged to operate said mechanism to allow of the operation of the bolt actuating means, and a key for operating said mechanism from the other side of the locking body to cause said spindle key to operate said bolt actuating means.

3. In a lock, the combination of a bolt, means for actuating said bolt, key operated mechanism, a spindle key connecting said mechanism with said actuating means, said key being partly confined within the lock body passing through said body, and being movable in and out of said mechanism and arranged to operate said mechanism from one side of the lock body to allow said spindle key to operate said bolt actuating means, and a key for operating said mechanism from the other side of the locking body to cause said spindle key to operate said bolt actuating means.

4. In a lock, the combination of a hooked bolt, means for actuating said hooked bolt, key-operated mechanism, a spindle key connected to said mechanism passing through the lock body and projecting beyond it, being movable in and out of said mechanism and adapted to operate said mechanism to allow of the operating of said actuating means by said spindle key, and a separate key for operating said mechanism from the other side of the locking body to cause said spindle key to function as a spindle for operating said bolt actuating means.

5. In a lock, the combination of a hooked bolt, means for actuating said hooked bolt, key-operated mechanism, a spindle key connected to said mechanism by means of a loose connection, passing through the lock body and being movable in and out of said mecha-

70

75

80

85

90

95

100

105

110

115

120

125

130

nism and adapted to operate said mechanism to allow of the operation of said bolt actuating means by said spindle key, means for limiting the movement of said spindle key in and out of said mechanism, and a key for operating said mechanism from the other side of the locking body to cause said spindle key to operate said actuating means.

6. In a lock, the combination of a bolt having a plurality of hooked bolts on its outer or locking end, means for actuating said bolt, key-operated mechanism, a spindle key connected to said mechanism with said actuating means passing through the lock body and being movable in and out of said mechanism and adapted to operate said mechanism to allow of the operation of said bolt actuating means by said key.

7. In a lock, the combination of a bolt, means for actuating said bolt, key-operated mechanism, a spindle key connected to said mechanism passing through the lock body, said key being movable into said mechanism a distance for operating said mechanism to allow of the operation of said actuating means by said spindle key, and removable a distance from said mechanism to allow of the relocking of said mechanism, means being provided for limiting the movement of said spindle key in and out of said mechanism, a separate key being adapted to operate said mechanism from the other side of the locking body to cause said spindle key to operate said bolt actuating means.

8. In a lock, the combination of a bolt having a plurality of hooked bolts on its outer or locking end, means for actuating said bolt, key-operated mechanism, a spindle key connected to said mechanism passing through the lock body and projecting outside thereof, said spindle key being movable in and out of said mechanism and arranged to operate said mechanism to allow said spindle key to operate said actuating means, means being provided for limiting its movement in and out of said mechanism, and a key for operating said mechanism from the other side of the locking body to cause said spindle key to operate said bolt actuating means.

9. In a lock, the combination of a bolt, a rotatable sleeve, means carried by said sleeve to actuate said bolt, key-operated mechanism, a spindle key connected to said mechanism passing through said sleeve, movable in and out of said mechanism and arranged to operate said mechanism to allow the spindle key to rotate said sleeve for operating said bolt actuating means.

10. In a lock, the combination of a bolt, a rotatable sleeve, a cam carried by said sleeve to actuate said bolt, key-operated mechanism, a spindle key connected to said mechanism passing through said sleeve and projecting partly outside the lock casing,

said spindle key being movable in and out of said mechanism and arranged to operate said mechanism to allow said spindle key to rotate said sleeve and operate said cam.

11. In a lock, the combination of a bolt, a rotatable sleeve, a cam upon said sleeve, mechanism for rotating said sleeve and operating said cam including a spindle key connected to said mechanism and passing through said sleeve and projecting outside the lock casing, said spindle key being connected to said mechanism by means of a loose connection and adapted to move in and out of said mechanism for operating said mechanism to allow said spindle key to rotate said sleeve and operate said cam, and a key for operating said mechanism from the other side of the door to cause said spindle key to rotate said sleeve and operate said cam.

12. In a lock, the combination of a hooked bolt, means for moving the bolt and for subsequently projecting said bolt into engaging position, said means including a rotatable sleeve and a cam carried by said sleeve, mechanism operable by a key for rotating said sleeve and operating said cam including a spindle key connected to said mechanism and passing through said sleeve, said spindle key being movable in and out of said mechanism and arranged to operate said mechanism to allow the spindle key to rotate said sleeve and operate said cam, a separate key being provided for operating said mechanism from the other side of the locking body to cause said spindle key to rotate said sleeve and operate said cam for actuating the hooked bolt.

13. In a lock, the combination of a bolt having a plurality of hooked bolts on its outer or locking end, a rotatable sleeve, means carried by said sleeve to move the bolt and to subsequently project said bolt into engaging position, key-operated mechanism, and a spindle key connected to said mechanism passing through said sleeve and being movable in and out of said mechanism and arranged to operate said mechanism to allow said spindle key to rotate said sleeve and operate said bolt actuating means.

14. In a lock, the combination of a bolt having a plurality of hooked bolts on its outer or locking end, a rotatable sleeve, a cam upon said sleeve to move said bolt and to subsequently project said bolt into engaging position, key-operated mechanism, and a spindle key connected to said mechanism passing through said sleeve and through the lock casing, said spindle key being movable in and out of said mechanism and adapted to operate said mechanism to allow said spindle key to rotate said sleeve and operate said cam.

15. In a lock, the combination of bolt provided with hook bolts on its outer or

locking end, a rotatable sleeve, a cam carried by said sleeve, said cam being adapted to move said bolt longitudinally and to subsequently project said bolt into engaging position, key-operated mechanism, a spindle key connected to said mechanism passing through said sleeve and projecting outside the lock casing to allow of manipulation of said spindle key, said key being movable in and out of the lock body and in and out of said mechanism, and is arranged to operate said mechanism to allow said spindle key to rotate said sleeve and operate said cam, stops being provided on said spindle key for restricting its movement in and out of said mechanism, and a key for operating said mechanism from the other side of the locking body to cause said spindle key to rotate said sleeve and operate said cam.

16. In a lock, the combination of a bolt, a rotatable sleeve, a cam upon said sleeve to actuate said bolt, and said cam acting to prevent reverse movement of said bolt except by the instrumentality of said cam, key-operated mechanism, a spindle key connected to said mechanism passing through said sleeve and projecting outside of the lock casing, said key being movable in and out of said mechanism and arranged to operate said mechanism to allow of the rotation of said sleeve and operation of said cam by the instrumentality of said spindle key, said mechanism preventing reverse movement of said cam except by the instrumentality of said mechanism, and a key for operating said mechanisms from the other side of the locking body to cause said spindle key to rotate said sleeve and operate said cam.

17. In a lock, the combination of a bolt provided with hooks on its outer or locking end, a rotatable sleeve, a cam carried by said sleeve, key operated mechanism for rotating said sleeve and operating said cam to cause the bolt to move and to be subsequently projected into engaging position, said mechanism including a spindle key connecting said mechanism with the sleeve passing through said sleeve and through the lock casing, said key being movable in and out of said mechanism and arranged to operate said mechanism to allow of the rotation of said sleeve and operation of said cam by the instrumentality of said spindle key, said cam being adapted to prevent reverse movement of the bolt except by the instrumentality of said cam, and said key operated mechanism acting to prevent reverse movement of said cam except by the instrumentality of said mechanism, and a key for operating the mechanism and causing said spindle key to rotate said sleeve and operate said cam when it is required to operate the locking mechanism from the other side of the locking body.

18. In a lock, the combination of a bolt

carrying hooked bolts on its outer or locking end, a rotatable sleeve, a cam upon said sleeve, said cam embracing a stud and a projection rounded to form a cam surface, key operated mechanism for rotating said sleeve and operating said cam to force said cam to move the bolt and to subsequently project said bolt and its hooks into engaging position, said stud and said projection being adapted to maintain said bolt in said projected position, reverse movement of the bolt being prevented except by the instrumentality of said mechanism.

19. In a lock, the combination of a bolt, a plurality of hooked bolts upon its outer or locking end, a rotatable sleeve, a cam upon said sleeve, said cam having a stud and a member rounded to form a cam surface, means on said bolt for receiving said stud on the cam, key operated mechanism for rotating said sleeve and operating said cam to cause said stud on the cam to coast with its receiving means on the bolt for moving said bolt, and said stud and the cam member to project said bolt and its hooked bolts into engaging position and to maintain it in such position, reverse movement of the bolt being prevented by said stud and said cam member except by the instrumentality of said cam, said key operated mechanism acting to prevent reverse movement of said cam except by the instrumentality of said mechanisms, a spindle key connected to said mechanism.

20. In a lock, the combination of a bolt, a rotatable sleeve, a cam upon said sleeve, mechanism for rotating said sleeve and operating said cam, a spindle key for operating said mechanism from one side of the lock body and a separate key for operating said mechanism from the other side thereof, said spindle key being movable in and out of said mechanism passing through said sleeve and projecting outside the lock body to allow of manual manipulation of said spindle key, a stop for limiting the movement of said key into said mechanism and another stop for limiting its movement out of said mechanism, said spindle key being adapted to function as operating means for said mechanism and as a means for rotating said sleeve and operating said cam subsequently to the operation of said mechanism, and embracing only the function of a spindle for rotating said sleeve and operating said cam, when the mechanism is operated by said outside key from the side of the door opposite to that controlled by said spindle key.

21. In a lock, the combination of a hooked bolt, a rotatable sleeve, a cam carried by said sleeve, said cam having a stud and a projection rounded to form a cam surface, a slot in said bolt for receiving said stud on the cam, a lock casing, a stud on the casing,

a slot in the bolt adapted to receive said stud on the casing, key operated mechanism for rotating said sleeve and operating said cam to cause said stud on the cam to move the bolt a distance, and subsequently to swing the bolt on said stud on the casing as a pivotal point into engaging position, and to dog said bolt in such position.

22. In a lock, the combination of a hooked bolt, a rotatable sleeve, a cam upon said sleeve to actuate said bolt, said cam including a stud and a projection rounded to form a cam surface, a lock casing, a guide stud on the casing, said bolt having a slot for receiving said stud on the casing, said bolt being mounted for slidable and pivotal movement on the casing, the bolt having another slot for receiving said stud in the cam, key operated mechanism for rotating the sleeve and operating said cam to cause said stud in the cam in its progress to move the bolt in said slot, a slot in said bolt allowing of the movement of said bolt in a longitudinal and vertical direction, an arcuate slot comprised by said bolt terminating in a stop, a ledge on the bolt, said cam in completing the revolution being arranged to move through said slots without actuating said bolt until said stud and said projection encounter said stop and said ledge respectively when they force said bolt to move into engaging position with said stud on the casing as a pivotal point, said stud and said projection acting to dog said bolt in said projected position, and said key operated mechanism acting to prevent reverse movement of the cam except by the instrumentality of said mechanism.

23. In a lock, the combination of a bolt having a plurality of hooked bolts on its outer or locking end and having a slot, a lock casing, a stud on the casing taking into said slot, said bolt being adapted for slidable and pivotal movement on said stud, a rotatable sleeve, a cam on said sleeve to actuate said bolt, said cam comprising a stud and a projection rounded to form a cam surface, said bolt having a slot for receiving said stud in the cam, a stop and a ledge on said bolt, key operated mechanism for rotating said sleeve and operating said cam to cause said stud on the cam in its progress along said slot in the bolt to move said bolt a distance, and subsequently to move without actuating the bolt until said cam members encounter said stop and said ledge when said members move said bolt into engaging position and to dog it in that position.

24. In a lock, a lock casing, a cylindrical member upon said casing, said member embracing an inner and an outer opening and a longitudinal slot extending into the casing, a tumbler barrel casing, said cylindrical member and said tumbler barrel casing being connected together for longitudinal adjust-

ment relatively to each other, a plate for covering the inner opening of said cylindrical member, said longitudinal slot permitting of the insertion of said tumbler barrel casing through said inner opening of the cylindrical member, a rotatable key plug carried by said tumbler barrel casing, an adjusting device operatively connecting said covering plate with said tumbler barrel casing, said adjusting device being adjustable for operation only at the inner aspect of said covering plate, a spindle key connected to said key plug by means of a loose connection passing through the lock casing and projecting outside of said casing to permit of manipulation of said spindle key, said spindle key being movable in and out of said key plug and adapted to unlock and operate said key plug to allow said spindle key to operate the locking mechanism in the lock casing, a key for operating said key plug from the other side of locking body being arranged to cause the spindle key to operate said locking mechanism, and means independent of said adjusting means for arresting the movement outward of said tumbler barrel casing.

25. In a lock, the combination of a lock casing having a removable plate, a cylindrical member upon said plate, said lock casing having locking mechanism, and said cylindrical member embracing an inner and an outer opening, a tumbler barrel casing, said cylindrical member and said tumbler barrel casing being connected together for longitudinal adjustment relatively to each other, a longitudinal slot in said cylindrical member passing into said removable plate to allow of the insertion of said tumbler barrel casing through the inner opening of said cylindrical member, a covering plate for the inner opening of said member, a rotatable key plug carried by said tumbler barrel casing, a spindle key loosely connected to said key plug, said spindle key being movable in and out of said rotatable key plug and adapted to operate said cylinder lock to allow of the operation of said locking mechanism by said spindle key, an opening in the covering plate permitting said spindle key passage through into the lock casing, a projection on said key plug and stops on said spindle key restricting the movement of said spindle key in and out of said key plug, an adjusting device operatively connecting said covering plate with said cylinder lock, said adjusting device being accessible for operation at the inner aspect of said covering plate, a key for operating said cylinder lock causing said spindle key to operate said locking mechanism when it is required to operate said mechanism from the side of the door not controlled by said spindle key, a flange at the inner end of the tumbler barrel casing, a flange at the outer end of said cylindrical member, said flanges being engageable with

each other and adapted to restrict the outward movement of said tumbler barrel casing and prevent violent removal of said cylinder lock from said cylindrical member on said lock casing.

26. In a lock, the combination of a bolt, means for actuating said bolt, key operated mechanism, a spindle key connected to said mechanism passing through the lock body, being movable in and out of said mechanism and arranged to operate said mechanism to allow operation of the bolt actuating means by said spindle key, a key for operating said mechanism from the outside causing said spindle key to operate said actuating means and means for rendering said bolt actuating means inoperative by both the spindle or the outside key.

27. In a lock, the combination of a bolt, a rotatable sleeve, means carried by said sleeve for actuating said bolt, key operated mechanism, a spindle key connected to said mechanism and passing through said sleeve, said key being movable in and out of said mechanism and adapted to operate said mechanism to allow of the rotation of said sleeve and of the operation of said bolt actuating means by said spindle key, and a key for operating said mechanism from the other side of the locking body to cause said spindle key to rotate said sleeve and operate said bolt actuating means, and a device for rendering said sleeve and said actuating means inop-

erative by both said spindle key and said outside key.

28. In a lock, the combination of a bolt, a rotatable sleeve, a cam carried by said sleeve, key-operated mechanism, a spindle key connected to said mechanism by means of a loose connection passing through said sleeve and projecting outside the lock casing, said spindle key being movable in and out of said mechanism and arranged to operate said mechanism to allow of the rotation of said sleeve and of the operation of said cam by said spindle key, a key for operating said mechanism from the other side of the locking body to cause said spindle key to rotate said sleeve and operate said cam, an opening in said sleeve, a pin mounted for slidable movement on said casing and adapted to be received by said opening in said sleeve, a push member projecting through a slot in the casing and attached to said slidable pin, said pin being adapted to be moved into said opening into the sleeve when it is required to render said sleeve and said cam inoperative from the inside or the outside of the door.

Signed at New York, in the county of New York, and State of New York, this 9th day of July, A. D. 1920.

ALEXANDER BLOCK.

Witnesses:

SIG. B. HINDLEMAN,
VIVIAN F. ROSE.